WMO

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

UNEP

IPCC WGII
Fourth Assessment Report
Climate Change Impacts, Adaptation and Vulnerability

Expert Review of First Order Draft

Specific Comments

Chapter 6

December 5, 2005

Discussion of expert review comments and record keeping

IT IS RECOMMENDED THAT:

- AUTHORS BEGIN WORK ON THE COMMENTS IMMEDIATELY. SUBSTANTIVE COMMENTS NEED TO BE SEPARATED FROM NON-SUBSTANTIVE, AND THE TWO SHOULD BE TREATED DIFFERENTLY
- CONTACT IS MADE BETWEEN AUTHORS AND THEIR REVIEW EDITORS IN DECEMBER

Substantive comments

- The chapter writing team should discuss all substantive expert review comments, by email and/or at Merida.
- Substantive comments require full and proper consideration. The *Principles Governing IPCC Work* state that:
  - genuine controversies should be reflected adequately in the text of the Report and
  - it is the role of the Review Editors to advise the lead authors on how to handle contentious/controversial issues
- You must record the outcome of these discussions in this document, under the column 'Notes of the Writing Team'.

Non-substantive comments

- For non-substantive comments, a very brief entry should be made in the column 'Notes of the Writing Team'. The following terms are acceptable:
  - Addressed
  - Not applicable
  - Text removed
  - A tick to denote a comment has been addressed (somewhere on the document this should be stated)

General

- The record can be kept electronically, or with pen-and-paper.
- The document becomes part of the traceable account of the Working Group II Fourth Assessment. When completed to the satisfaction of the Review Editors, a copy should be returned to the TSU by the **28th February 2006**.

Overall Comments

As a chapter group, we would like to record that we feel constrained by the structure that has been imposed on us by the IPCC. Several reviewers have also suggested that the Chapter could be more efficiently organised. For instance merging Sections 6.2 and 6.4 would make sense to us and some reviewers.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
6-0	A	0				**Co-chair and TSU comments** General comments: This draft is much advanced since ZoD. More contributing authors could broaden the range of examples. Please follow recommended reduced form section headings, i.e. 6 should be "Conclusions: implications for SD" and should include broad conclusions (more below); and 5 should be "….socio-economic aspects" Length: you have condensed much and focussed on your emerging key issues. Good but length still needs reduction. 22 pp refs=11 pp printed page; and 53 pp text = 39 pp printed. Text needs reducing by one-third to 25 pp I suggest: a) section 6 on adaptation be boiled down to one-half its present length. Too discursive. b) sections 1,2 and 3 be condensed by one-third. They cover the main points and just need distilling. c) section 4 should be half the whole text i.e remain its present length Concentrate on distilling where possible and adding where advised by the specialised reviewers. Condensing could be achieved by i) taking all material in 6.4.2 to 6.5 (and condensing the current material in 6.5, but adding more on altered impacts (eg millions at risk) under different SRES and stabilisation scenarios (which seem to be missing) , ii) folding all 6.4.3 into 6.4.2 (Other chapters have done this). Exec summary and conclusions: should emphasise a) what TAR conclusions are confirmed, and b) the key NEW conclusions you draw (I suggest in priority order), and c) attach confidence levels to	Will remove duplicative text and we will enforce the page guidelines from the TSU as communicated at the Cairns meeting Could merge 6.2/6.4 but cannot so we will follow the Cairns structure – modified chapter allowances have been agreed that will deliver a chapter of appropriate size. For the other points, we will do the best that we can within the limits of the literature.

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						these in the ES For concluding section I suggest you consider following the example of Ch 4 which created an effective summary of findings, thus: a) table summarising impacts by increments of T change (table 4.5); b) a summary of projected impacts worldwide (figure 4.9); and c) a burning embers diagram for each subsector to show key vulnerabilities (fig. 4.10 **Need to be clear where coral is covered, whether in ch 4 or 6, or in both **Case studies are good. What about joint one on recent tropical cyclones (with small islands chapter) Below is a copy of comments ON THE ZERO-ORDER DRAFT by Martin Parry [and in square brackets a comments regarding the response in the FOD revision}: The draft is 3 times the length limit (which should be 33 pages in this version, and equals 30 pages in the printed version). [ZoD is much condensed, but still needs more] Much of the text could be reduced by : 1) emphasising the conclusions of each aspect of the assessment, and substantiating this with references, but omitting discussion of method (except where this clearly affects robustness of the conclusions, etc.); [mainly now done] 2) use of tables to summarise knowledge; [much more could be done here, with tables to effectively summarise and save space, cf eg tables in ch 4 and boxes in ch 5] 3) emphasing knowledge that reinforces or revised conclusions of TAR; and omitting details that is less policy-relevant. 4) section 6.5 on key impacts at present comprises less than a quarter (in page	

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						terms) of the total, but probably should make up half, since this is the guts of the assessment; 5) Reduce the four introductory sections to about 5 pages in all; that would then give you space for the core impact assessment [FOD is getting there] Please folow the numbered structure, as other chapters have done. [now more like the common structure; with minor changes still recommended] Section 6.5.2 is really about costs and other socio-economic effects, is it not? Suggest you make this the new section 5. Are you able to achieve some global and regional summary of projected effects, perhaps tabulated and mapped? [not yet included in FOD and still recommended] Is it possible to separate out in the text a) the treatment of effects under different development pathways? Eg under SRES scenarios, and b) assesment of effects (and effects avoided) uder stabilisation scenarios. [not yet included in FOD and still recommended] Finally, more (small) figures and tables to lighten up the unrelenting text. In general, you will need time to consider as a writing team what is the most important new material which deservs inclusion, and what can be omitted; and to summarise your concluding main messages. [FOD now has more focus, but key emerging issues not drawn together in conclusions and reported in ES] Is it possible to identity 'key' impacts in the sense of thresholds, which can help ch 19 in drawing some of these together (eg in terms of what are key effects to avoid) [more on this is now included in FOD, but how about (as done in ch.4) summarising in a table the projected effects for given increements of global T change/SL rise] **(Martin Parry)**	

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6-1	A	0				Some useful references on Coral reef bleaching in the region of south Asian region may be found in the "Proceedings of International Symposium on Coral Reefs, Bali, 2000. (e-mail : wafar@nio.org) (Unnikrishnan Alakkat, National Institute of Oceanography)	More recent references including the subsequent meeting in this series.
6-2	A	0				General Comments - good explanation and discussion of the complexity of climate change, long-term impacts and limited understanding of coastal ecosystems. In reading this chapter I found that at one end of there was comprehensive and complete discussion of what will likely happen at the geo-physcial scale (eriosion, flooding etc.) to coasts and low lying areas and then at the other end was a discussion of how humans may or may not adapt to climate change with little discussion/description of what might happen at the natural/ecosystem scale or what will happen to the ecosystem services in coastal and low lying areas. For example - inshore coastal fisheries, marine mammals (not just whales but sea otters for example), waders, kelp beds, etc. In missing this intermediate level I think the strenght of the credibility of some of the statements made about higher order impacts on marine mammals and humans is diminished. Perhaps this intermediate level is covered in other chapters in this volume, but in reading the table of contents it was not obvious to me. Another General Comment - while the recent tsunami disaster highlighted coastal vulnerability, the resulting impacts and their links to climate change are weak at best. If space is tight reducing text associated would not diminish the overall messages in this chapter. Indeed if the authors have the time and energy - drawing on references to the recent Katrina cyclone would have greater relevance in the next version of this chapter. Another General Comment - the authors might want to draw on the International Human Dimensions Program case studies for some examples of adaptation Another General Comment - I am not sure if this is relevant to the assessment, but it would be nice for the reader, especially from a policy perspective, if there was a bit more on answering the question if enough is being done. While the authors talk about the different scenarios and how impacts may differ, the reader a) is left with a confusing message on adaptation versus mitigation and b) does not get a clear picture if there is enough being done for either adaptation or mitigation. A table or map indicating how countries/areas are doing would be helpful (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Need to add more on coastal biodiversity, and changes as much as literature allows – Hawkins paper and also RegIS and Monarch studies on saltmarsh plants in UK. Look for examples elsewhere than UK. [VB] Will strengthen hurricanes and reduce tsunamis. [all authors] Will look at IHDP case studies [JH] Will consider the question “is enough being done” but we feel that the primary literature will not allow much more to be said. Will review regional chapters if a global synthesis is possible. [JH] Climate mitigation is a WGIII issue.
6-3	A	0				Reading the chapter in its present form, I am struck by the extensiveness of natural science treatment, and the relative poverty of social scientific insights, with the exception of economics. This is recognised by the authors. I believe that this is not	We will attempt to strengthen the social science perspective [all] Space does not allow a more comprehensive

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						a correct assessment, however. Social scientists have contributed many insights that are relevant to this chapter, which could be tapped. Several examples are given below. I don't know, however, whether the author group possesses the necessary expertise to bring this in. Social impact analysis, for example, is a blossoming field of scholarship. The chapter uses socio-economic development scenarios to explore future trajectories and bring in aspects of demography, economic growth, and attention to conservation. This is fine. However, I think it would be useful to add a dimension that I would call 'present socio-economic status', as this is the starting point for whatever trajectory takes place. This dimension would include the division between resource rich and resource poor countries (with at one extreme the so-called developed world, and at the other the 'least developed countries', particularly in Africa). It would also include, at a lower scale, a division between rich, middle class, and poor population groups. The World Bank report 2001, Attacking Poverty, points out, for example, that the poor inhabit the most vulnerable locations, and possess the least resources to counter, and to recover from, natural disasters. Insights such as these are remarkably absent from the present draft chapter, although it is alluded too on page 53 in conclusion 8. The authors appear to have tried to achieve a balance between the examples that are provided, in order that geographical regions have a reasonably equal representation. This is not an easy task, as some regions have been studied more than others. The region that is presently severely under-represented is Africa (and perhaps Latin America too). This is unwanted, and might be corrected, perhaps by consulting the authors of 9 (and 13). (Maarten Bavinck, University of Amsterdam)	status of coastal areas. Will add more regional examples [all]
6-4	A	0				I was asked to review this chapter and after receiving it realized that most material is outside my expertise. However, having read about one third of the report I decided that it might be helpful to finish the review and provide some general comments. This is a solid attempt to inform experts and non experts. It is too long and too repetitious, but a good editor should be able to solve this problem. I appreciate the difficulty in producing a shorter report, but the report could easily be reduced by 15% and by 30 % with some difficulty (Richard Beamish, Pacific Biological Station)	Agree
6-5	A	0				This chapter is thorough and up-to-date. It is about 25% over the page limits and would benefit from removal of repetition and tighter writing. In particular, there	The chapter will further strengthened concerning factors other than sea-level rise

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						are sections that seem more as litanies, wherein sentenences each summarizng a particular paper are strung together, rather than a coherent train of thought. The prominent inclusion of references to publications of the contributing authors is also a bit excessive. While the authors stress that there are important consequences of climate change to coastal systems in addition to sea-level rise, there is little consideration of them. 90% or more of the chapter deals with sea-level rise. It would be helpful if there were more consideration of some of these other consequences. For example, temperature changes are likely to result in biogeographic shifts of biota, with consequences to fisheries, coastal wetlands, etc., and open doors to invasive species. Also, changes in freshwater inflows will likely have consequences to productivity of coastal systems, eutrophication and other aspects which humans are attempting to manage. These discussions need not be long, but at present they are scarcely mentioned. There is inconsistency in the hyphenation of "sea-level" when used as an adjective. (Donald Boesch, University of Maryland Center for Environmental Science)	Sea level will be copy edited.
6-6	A	0				There are many good and not-so-good ideas for technological carbon dioxid+K4e (& methane?) sequestration, some of which have impacts and consequences in the coastal zone, continental shelves & slopes. Pumping gaseous or liquid CO2 below the thermocline has been proposed, with signicant acidification and changes in nutrient and metal speciation expected. Using coastal wetlands as carbon traps has been proposed, but can only have limited life times for the small remaining areas of wetlands and mangrove swamps. None of this is discussed or critically evaluated in this chapter. Some references are given for these studies. With a few exceptions, there is little synthesis and skillful creation of new insights from the cited references in this chapter. We seem to get a series of references, with uncritical acceptance of the studies, and no new insights from the grand summary of all the work done in the past 3 years. I wonder if some "reverse ecological footprint" concept could be created to better quantify some of the expected impacts of climate change in the coastal zone, especially where many coastal industries, communities, megacities, agriculture, aquacultural fisheries may be lost, or will retreat inland in the next century. Such a "climate change footprint" might illustrate feasible options and options that are simply not practical or possible. Where would the people of Bangladesh and the people on the Mekong Delta go, and how would this migration affect inland ecology and communties? It is very odd that there is no discussion of the impact of coastal ocean warming on the stability of carbon dioxide and methane hydrates in sediments of the ocean margin. If ocean warming proceeds as predicted, it seems likely that some of this	Outside scope of chapter – will delete text which touches on this aspect. Will explore if literature allows. Outside scope of chapter – make sure reflected in Introduction [RN]

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						large reservoir of powerful greenhouse gases will be released, perhaps associated with non-climate change phenomena (submarine earthquakes, continental shelf/slope slumping, cold vent eruptions). This is a case where exceedance of some unknown threshold seawater temperature could lead to severe and rapid increases in greenhouse gases in the atmosphere. (Gregg Brunskill, Australian Institute of Marine Science)	
6-7	A	0				The chapter is dominantely about sea level change impacts on the sea coast, with little emphasis on other important impacts of climate change, such as rising temperature, rising atmospheric water vapour & methane, acidification of water from carbonic acid, carbon dioxide fertilization of wetlands & coastal swamps, changes in biodiversity and biomass, and increased heat effects on productivity & respiration, nitrogen fixation and denitrification, methanotrophy and methanogenesis, exposure of coastal acid sulfate soils, and coastal disease in fish, humans, corals and other organisms. This chapter does not cover the ocean margins, and says little about coastal oceanic water mass properties & circulation changes in response to increased heat flux from the atmosphere to the ocean. If not covered elsewhere, there should be some coverage of estuarine wetlands & swamps, saltpans and mangrove forests, continental shelf & slope, and continental seas, and how these might be affected by increased heat flux from the atmosphere. An interesting calculation from data presented in this chapter would to estimate the expected increase in continental shelf area from a 50-100 cm sea level rise. I think sea level was 100-150 cm higher during the early Holocene, and many coastlines have evidence of this higher sea level up inside the floodplains of river valleys. Some recent regional and global disasters nicely illustrate the lack of future planning and investment in defences against natural disasters and/or climate change consequences. Hurricane Katrina & Rita both illustrated regional and global consequences to local people and the price of oil, and may be related to warming of surface waters in the Gulf of Mexico. The tsunami around the Indian Ocean shattered the physical and social aspects of both poorly developed and well developed countries. The direct and future costs of these incidents would make nice examples for our vulnerability status. The cost/benefit ratio for rebuilding New Orleans at 3 m below sea level should be severely examined as an example of immediate need for consideration of the abandonment choice early in the game, in comparison to the Netherlands. If 30,000 people died of heat stress in western Europe during the heat wave of 2003, do the relatives of these people have cause to bring legal suite against the coal and oil companies? What needs to be done to	Accept (see 6-6) Outside scope of chapter. Accept.

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						avoid another large loss of life due to heat waves in Europe (or North America, or SE Asia)? (Gregg Brunskill, Australian Institute of Marine Science)	
6-8	A	0				General comment on the chapter and the review process: It appears to me that the "first-order draft" stage is not really ready for the line-by-line commentary implied by this review sheet. There are a number of individual points that I would have commented on if the document were in a more nearly final form, but I am making enough recommendations for significant revision and reconsideration that I am not sure that many of them would survive in a form relevant to the comments. In order to be ready for "expert" review, the text needs to have been gone over by a good scientific copy editor to eliminate redundancies, ambiguities, and organizational infelicities, so that the science the the authors are trying to present is truly accessible for review. Appendix on organizational 'what-might-have-been' (written prior to realizing that the section headings and order were preordained): I suggest that there would be a number of advantages to be gained from making this section 6.2 (that is, trading places between the present 6.2 and 6.3). I consider the issues with respect to 6.1 and the present 6.3 in this comment; the following one addresses issues related to the present 6.2 and 6.4. The major content of section 6.1 is much more closely related to the material in section 6.3 than it is to 6.2; similarly, 6.2 and 6.4 are closely related. In my opinion, the flow of the topics discussed will be more logical and smoother if the order is TAR-FAR-Present Climate-Future Climate than if the middle two were in their present order. A further benefit is that this will provide the policy-oriented reader with a more gradual transition from the policy and scenario-related material into the technical physical geography and coastal engineering material of the present sections 6.2 and especially 6.4. Having argued that the present 6.2 and 6.4 should be juxtaposed, I now argue that they should be merged into a single section ("Sensitivies, vulnerabilities, and future impacts"). Both address natural and human drivers of coastal change and their interactions, and both describe an earth system in which climate change and anthropogenic alterations are in progress -- in spite of the fact that the title of 6.2, "Natural coastal systems," strongly implies otherwise..The difference between present, past and future is not irrelevant, but I think it would be better honored by including subsections (a paragraph or so) in the 6.4 material in which the relevant 6.2 material is presented to set the stage for the projections. 6.4 presently starts without introduction; a CONDENSED version of 6.2.1 and 6.2.4 COMBINED, followed by the present 6.2.2, would be a good entry into the section. The other	Cannot change structure – will improve readability and follow TSU guidelines on distinguishing Section 6.2 and 6.4 as explained by review editors [CW/VB/SR/JC]

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						subsections of 6.2 can be readily associated with parts of 6.4. As presently worded, section 6.2.3 paragraph 1 relates almost entirely to 6.4.1.2, with which it could be consolidates. Paragraph 2 of 6.2.3 seems to be there only for symmetry with paragraph 1 (the issues mentioned are discussed repeatedly in other sections) and could be eliminated. In section 6.2.5, the inconclusive first paragraph could be eliminated, and the coral-related material combined and condensed with section 6.4.1.4. The sea-ice and permafrost issue needs reconsideration and revision, as it is nowhere mentioned in 6.4 (the future impacts section) except to characterize it as a "key vulnerability" on p 36 line 22 and p 37 lines 22 and 23. Apparently that status is accorded entirely on the basis of the comments in the 'detection' section of the present 6.2, plus chapter 15. I think it would be better to put the existing material, with at least some remarks on the future trajectories, into its own subsection in 6.4. The significance of the Arctic melting and erosion is great enough -- loss of the major ice-dependent ecosystem components (bears, seals, Inuits), plus the potential positive GHG feedback due to peat oxidation and possible gas hydrate release. A recent article (Chapin et al., Science 310:657-660, 2005) demonstrates ecosystem feedbacks to the warming process (see also note on ecosystem effect and process coverage). (Robert Buddemeier, University of Kansas)	
6-9	A	0				Comment on chapter subject mattter and emphasis: After reading the chapter several times, my residual impression is that it is mostly, and certainly most thoroughly, about sea level rise (SLR) and storms, and within those topics, primarily about the physical effects and consequences. These are important topics and ones that lend themselve to relatively quantitative discussion, but in my opinion the balance of the chapter needs to be shifted to include more attention to the climate change drivers other than SLR and hydrodynamics, and to the eological/biological effects (discussed in more detail below). SLR is progressive and inevitable, but it is gradual (in the near term), and long-term. Brad Opdyke once pointed out to me that by 2100 the combined conditions of surface SST and carbonate saturation state will represent an ocean that has not occurred since the early Eocene -- when the WAIS does finally slide off, it will do so in a very different world from the one we know today, and I think we need to look harder at those more immediate changes. Humans have enough trouble planning and managing a few decades into the future; it is interesting that SLR will go on for centuries, but I don't think we need to spend much print on the consequences of that. Comment on chapter -- treatment of ecosystems and ecosystem impacts: The three	These are good comments regarding treatment of ecosystems and ecosystem impacts and will be reflected in revisions to 6.4. (Virginia). This is helpful, but not the complete picture,

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						ecosystems (as opposed to environments) that get significant discussion are coral reefs, mangroves, and sea grasses. These represent an interesting set of choices in that all three have suffered heavily from direct human actions, while reefs provide both direct and indirect (harvest/commercialization, protection, general biodiversity etc.) benefits to humans, and are threatened both by rising temperatures and CO2; mangroves similarly provide benefits and are probably neither substantially helped nor threatened except by SLR in specific locales, whereas seagrasses are only of modest indirect benefit to humans, but are unequivocally helped by rising CO2 (which compensates for reduced light due to water turbidity) and not extremely threatened by other climate changes. However, these similarities and contrasts are not exploited to make relevant points, and of the three, only the seagrasses are extratropical (but marine). I think additional discussion of temperate community responses is in order -- for example the text states that not as much is known about mangroves as about salt marshes (p24 lines 22-23), and then does not summarize the salt marsh knowledge except for brief comments with respect to SLR, while going on to present a series of relatively unintegrated results of individual studies on mangroves. What are the generalities -- even if qualified or locally applicable -- that we can take away about both systems? Are there boundaries in the nature of intertidal or nearshore communites that relate to the occurrence of freezing air/ground temperatures, and if so, how will these shift? The text at present implies that temperature changes are insignificant compared to hydrodynamic shifts, but certainly the prospect of changing lengths of the growing season and of the frequency and intensity of frost/freezing days has significant implications for natural systems as well as for crops. (Robert Buddemeier, University of Kansas)	because increasing DOC and CO2 can lead to suspended algal blooms and, perhaps more importantly, epiphytic algae that lead to seagrass decline.
6-10	A	0				Comment on Chapter -- The authors make frequent reference to the Asian tsunami as an illustration of various points. To this might now be added the 2005 hurricane season, with its impacts on Central America, the US, and Caribbean islands. I think this is a particularly useful issue to consider, since it suggests modification of the conventional wisdom that developing countries are more vulnerable to natural disasters. In fact, while it may be true in terms of gross loss of life, it seems likely that a developed country with an extensive coastal defense system may have relatively more resources at risk behind the protection, and be poorly equipped to deal effectively with catastrophic failure of the system when it does occur. (Robert Buddemeier, University of Kansas)	Agree – will use hurricanes
6-11	A	0				GENERAL COMMENT: The maximum page limit for Chapter 6 is 30 pages and the FOD will need to be shortened from 78 to 60 draft pages. As with any mult-	Agree

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						authored report where separate sections are written by different authors, there is overlap among some topical sections and repetition of some facts. In addition to pointing out gaps in content that need to be filled, I have indicated below where the text can be reduced by eliminating repetition. GENERAL COMMENT: I know that Expert Reviewers are to ignore editorial details (spelling and punctuation), but there are some sentence structure issues in the FOD that result in unclear use of verbs, missing verbs, or sentence fragments (e.g., page 17, lines 27-28; and page 33, lines 27-28), which makes evaluating the content difficult. I suggest that Authors and Review Editors go over the entire text carefully to clarify meaning. GENERAL COMMENT: The topical outline for Chapter 6 incorporates all of the components of the Plenary outline, is comprehensive, and is logically organized. Although all of the topics are appropriate and need to be discussed, discussion of some of the topics will need to be shortened considerably to reduce the length of the FOD to the maximum page limit. The assessment is based primarily on literature which has appeared since the TAR (1999). GENERAL COMMENT: Overall, this chapter provides many new insights compared to the TAR. The authors dealt with complex issues and interactions, but were able to add value in their reviews through sound reasoning. I particularly found the discussions of adaptive capacity very interesting and insightful. (Donald Cahoon, Patuxent Wildlife Research Center, Beltsville Lab)	Agree Agree Agree
6-12	A	0				Our experience and therefore contribution relates mainly to the Venice situation and must be seen together with comments by Jane da Mosto (I). Several of the comments here could be equally relevant to sections of Chapter 12 (EUROPE) (Pierpaolo Campostrini, CORILA)	Agree
6-13	A	0				The Chapter structure covers thoroughly the main issues regarding coastal systems and climate change. The sections are well balanced, and they progress in a logical sequence from a summary of the TAR to adaptation strategies, ending with the nowadays key uncertainites and priorities. Within the sections, some parts are very difficult to read because the sentences are too long. There will be specific comments on that section by section. There are also very few figures and tables considering the amount of information that is given in this chapter. Especially in the beginning of the text, some reference is made to the Indian Ocean tsunami on December 2004. The authors must be very careful to state clearly that tsunamis are not part of climate change impacts, if they want to use it as an example of "fragility" of coastal zones. There will be specific comments throughout	Agree Agree Agree

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						the text. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	
6-14	A	0				Our experience and therefore contribution relates mainly to the Venice situation. Several of the comments here could be equally relevant to sections of Chapter 12 (EUROPE). See also comments from Campostrini (Jane da Mosto, CORILA)	Make purpose of examples clear, including Introduction [RN and all authors]
6-15	A	0				I have detected several 'et al.' in regular font, I believe they should be all in italics. I have detected some 'El Niño' which are missing de ~ (Luciana das Neves, Hydraulics and Water Resources Institute | Faculty of Engineer, University of Porto)	Agree
6-16	A	0				I was Co-Chair of similar chapters for the First and Second Assessments including this topic. I am Project Manager of the UN Atlas of the Oceans. Resume is available at http://www.OceanAssoc.com The Chapter is generally well done and covers a great deal of literature. In covering so much literature, in some places, there is not smooth enough linking of somewhat disparate thoughts from multiple sources within a single paragraph. There are too many new words to me, or rarely used terms, and I have been in this business for decades. These make things more difficult for non-native English speakers. Some of these are "easily eroded lithology", "plan-shape evolution", "eustatic sea-level", "metastable carbonate", "clastic sediment",and "altered aragonite saturation" In several places in the text, statements are made about SLR continuing irregardless of GHG emmissions. The context needs to be introduced up front, and reiterated in each of these places, that SLR has been continuing since the last ice-age and in recent centuries has been about 1-4 mm/year. This will continue. Some real examples would be useful, such as tree stumps on Georges Bank, fresh-looking oyster shells in 50 m water off New Jersey, Indians walking to Nantucket just a few thousand years ago. Relatedly, at least up to a couple years ago, NOAA reports indicated no acceleration in SLR is detectable and this should be a first indication that the GCMs are correct, and thence the SLR projections, as accelerated by GCC, are valid concerns. (John Everett, Ocean Associates,Inc.)	Agree – will try and remove technical terms and define all those that are needed in the Glossary (by 28 Feb 2006) [all authors] Add Coastal squeeze, ocean acidification and (maybe) morphodynamics to the Glossary. The science in the assessment is based on the IPCC WGI. Include in Introduction [RN]
6-17	A	0				Yes, coasts are dynamic; coastal systems experience multiple stresses including climate changes, human activities …; the stresses, vulnerabilities, responses, and adaptive capacities are significantly site specific; all major themes have almost been included in the Chapter. it aslo addressed to adapation that can greatly reduce adverse impacts for human society but often at the expense of natural ecosystems.	Accept.

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						Anyway, we should notice that a great effort has been carried to find some mitigation measures that do good to both human society and natural ecosytems, like soft engineering. In developing countries, appreciation of value of natural systems is increasing. In china, lots of natural coastal wetland conservations have been constructed. Awareness and effort to harmonize human-nature interaction are increasing but not enough addressed in the chapter. (Daidu Fan, Tongji University)	Accept. Discuss in sustainability section (6.7)
6-18	A	0				Assumptions are well described to help better understanding the issues even for non-specialist. However, options, practices, capacities and constraints associated to adaptations seem to be difficult to be implemented. (Savitri Garivait, The Joint Graduate School of Energy and Environment (JGSEE))	Agreed.
6-19	A	0				Generally speaking, the report is difficult to read because it does not integrate enough the information coming from the different sources. Two much quotations are made one after another to the detriment of the coherence of the text. (Yves Henocque, Department of Fisheries)	We will improve readability as suggested. (All)
6-20	A	0				The issue of storms and their predicted increased frequency and magnitude is viewed as one of great importance when it comes to understanding the impact of climate change on coastal systems. Chp.6 does not deal sufficiently with this and glosses over many important points. For example, the likelihood of storm impact on particularly soft sedimentary coastlines, will depend enormously on coastline orientation, tidal range, coincidence with high tide and storm event maximums as well as nearshore bathymetric make-up. The western Irish coast comprises a highly compartmentalised series of headland-embayment cells in which sand and gravel beaches are typically backed by large vegetated dune systems. Exposure to modally high-energy swell renders most beach systems dissipative in character. This coastline has a highly variable response of beach and dune systems to storm forcing at a decadal to century scale over a length of 200km and suggests that caution must be exercised when making generalisations regarding regional-scale coastal responses to climatic change. The occurrence of morphodynamically significant storms (i.e. those having a direct impact and major impact) is significantly less than the total number of storms that affect the coast (See Cooper et al. 2004: J.A.G. Cooper, D.W.T Jackson, F. Navas, J. McKenna & G. Malvarez (2004) Storm impacts on an embayed, high energy coastline: western Ireland. Marine Geology, 210, 261-280. (Derek Jackson, University of Ulster)	We agree with first statement and will emphasize “caution must be exercised when making generalisations regarding regional-scale coastal responses to climatic change”.
6-21	A	0				The authors of Chapter 06: Coastal Systems and Low-Lying Areas in the IPCC Fourth Assessment Report (Draft for Expert Review) should be applauded on their	Accept.

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						thorough and rigorous approach. The Chapter is a comprehensive and balanced analysis of the current state of knowledge of the potential impact of climate change and sea-level rise on the global coastline. The importance of coastal zones to global ecosystem function, economic activity and human wellbeing deserve the level of attention paid by the authors. Comments focus on my area of expertise: aspects relating to coastal zone management responses to potential future climate change and sea-level rise. The detailed comments below should be viewed with my review focus in mind. Some factual errors and misinterpretations will require attention prior to the publication of the Chapter. Suggested re-wording is provided where appropriate. References: Agardy, T. e. a. (2005). Coastal Ecosystems and Coastal Communities. Millennium Ecosystem Assessment: Condition and Trends Working Group Report. R. Hassan and N. Ash. Washington, Island Press. Cicin-Sain, B. and R. W. Knecht (1998). Integrated Coastal and Ocean Management: Concepts and Practices. Washington, DC, Island Press. Clark, J. R. (1996). Coastal Zone Management Handbook. Boca Raton, CRC Press. Kay, R. C. and J. Alder (2005). Coastal Planning and Management. London; New York, Taylor & Francis. Western Australian Planning Commission (2003). Statement of Planning Policy No 2.6 State Coastal Planning. Perth, Australia, Western Australian Planning Commission. (Robert Kay, Coastal Zone Management (Australia) Pty Ltd)	
6-22	A	0				general comment on coastal area and coral reefs. In general, many examples for non-climate stresses (in the case of coastal area and coral reefs, artificial construction, over-fishing, nutrient input, increasing (by agriculture) or decreasing (by dams) sediment supply, pollutants.. are shown. I understand these non-climate factors put cumulative stresses to coastal areas and coral reefs. However, the scope of IPCC is not for environmental issues in general, but for global climate change, and the readers want to know how these local stresses act to degrade the coastal area and coral reefs in combination with global environmental changes. (Hajime Kayanne, University of Tokyo)	Accept. We will reduce number of references to non-climate stresses.
6-23	A	0				General comment: The chapter has a large number of mistakes in grammar and spelling, which I expect your writing experts will catch. There seems to be a lot of redundancy among sections, especially with regard to the efects of sea-level rise. Further, sea-level rise dominates the presentation. There is mention of temperature	See responses above. Redundancy and grammatical errors will be reduced.

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						effects on corals, but I would have thought there should be more on the effects of temperature on commercial species along coasts. For example, species distributions will be affected and some species will be lost from the ecosystem and others will enter. This has implications for coastal food webs in which commercial fish and invertebrates participate. Fisheries will probably be changed by changes in species distributions. There is some mention of these issues in Chapter 4, but the socio-economic effects of these changes could be addressed more in Chapter 6. I'm an ecologist, not an economist, so cannot provide informed critique on costs, benefits, or socio-economics. (Victor Kennedy, University of Maryland Center for Environmental Science)	(see responses above)
6-24	A	0				Estent of "coastal zone" is hoped to be more clearly defined. Especially, several large cities are located along riverside (not directly at seacoast), but will face to impact from e.g. sea level rise. (Hideyuki Kobayashi, Ministry of Land, Infrastructure and Transport)	Accept, we will provide a more clear definition of coasts and low-lying areas. (RN)
6-25	A	0				General remark. The accordance of citations in the text to the list of references should be revised. I would recommend to add to the list of references the following publications: 1. Johansson, M. M., Kahma, K. K., Boman, H. & Launiainen, J. 2004: Scenarios for sea level on the Finnish coast. Boreal Env. Res. 9: 153–166.; 2. Orviku, K., Jaagus, J., Kont, A., Ratas, U., Rivis, R. 2003. Increasing activity of coastal processes associated with climate change in Estonia. - Journal of Coastal Research 19, 2, 364-375. (Are Kont, Institute of Ecology, University of Tallinn)	We will get these references and review them (RN)
6-26	A	0				General Impressions: 1) a less repetitive and better structured discussion and 2) stronger scientific framing than the zero draft version, however 3) significantly less emphasis on progress since last IPCC report. (Loraine McFadden, Middlesex University)	Accept.
6-27	A	0				Vietnam: The GVA (1992) indicated that Vietnam with its 3500 km long coastline was critical vulnerable for a 1 m ASLR in terms of strong increase of people at risk, wetland at change and about 15% loss of rice production, if no native measures were taken. Basic coastal protection costs could give rise to a high value of 1,4% of Vietnamese GNP. The subsequent IPCC-Vulnerability Assessment of Vietnam (1994 – 1996) identified in more details the sensitive coastal areas of Vietnam and concluded that ICZM is the main adaptive response strategy option for the coastal areas in Vietnam. Preparing such an ICZM programme required some time. The Vietnam-Netherlands ICZM project (first phase: 2000 – 2005) is hosted by the Vietnam	Will review references cited and may mention as an example in Section 6.6 (JH) Also will examine Asia chapter (Ch. 10) to see if Vietnam is used as an example there. (JH)

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						Ministry of Natural Resources and Environment and financed by the Netherlands Ministries of Internal Cooperation (http://www.nea.gov.vn/html/duan/English/VNICZM). Long Term support is also being given by the Netherlands Ministry of Transport, Public Works and Water Management through executing a assisting coastal cooperation program based on a Memorandum of Understanding 2004 – 2009. To ensure the vertical and horizontal integration of ICZM project, the VN-ICZM project is simultaneously executed in the Hanoi and three coastal provinces in the North, middle and South of Vietnam. During the first, planning phase many activities were executed such as: prioritization of natural and socio-economic coastal problems; large scale data-collecting; promoting Remote Sensing, GIS and integrated modeling (Misdorp 2005); meta-data base development on the project website; capacity building on coastal management, coastal physical planning, coastal protection; awareness campaigns on the role of water for coastal zone (fresh water availability, sea level rise); ICZM Strategies at National and Provincial levels; regular newsletters are produced. During the following ICZM phase, multiple donor (The Netherlands, Sweden ad ADB) coastal assistance will be focused on implementing sustainable, no-regret coastal measures such as increasing the coastal resilience through conservation and rehabilitation of coastal wetlands combined with guided eco-tourism developments, coastal zoning of functional uses related to coastal vulnerabilities, reducing coastal pollution through sanitation measures and increasing coastal protection through soft coastal protection measures. Extensive reporting is available. Fourth suggestion : Insert an update of the WCC'93 Vulnerability cases and ICZM cases implemented in developed and developing coastal countries illustrating experiences and lessons learned in regard to adaptive coastal measures. (Robbert Middorp, Senior Advisor of the Netherlands Ministry of Transport Public Works and Water)	We will review this report and consider for inclusion in Section 6.6 (JH) Will review references cited and may mention as an example in Section 6.6 (JH)
6-28	A	0				References used: Eurosion: 2003: "Rotterdam Case " in "Living with coastal erosion in Europe", European Commission 2003, Luxembourg Publication Office of the European	

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						Communities. Bolsius, E., Frenkel, L., Hillen, L., De Kruik, H., De Win, J. 1999: "A coastal zone perspective", published by the Working Group – Interdepartmental Vision for the Coast, RIKZ, P.O.Box, 2500 EX, The Hague, p42 Helmer, W., Vellinga, P., Litjens, G., Goosen, H., Ruigrok, E., Overmars, W., 1999: " Growing with the Sea – Creating a resilience coastline", World Wide Fund for Nature, Zeist, The Netherlands, ISBN 90-74595-09-X, p 36. (www.wnf.nl) Kraak, A., Balfoort,H., Vroon, J. Hallie,.F., 2002: "Tradition, Trends and Tomorrow – The 3 rd Coastal Policy Document", RIKZ Publications and Documentation, The Hague, p12 Min.V&W/Rijkswaterstaat, 1990: " A new coastal policy for the Netherlands", Ministry of Transport, Public Works and Water Management, 2597 JG The Hague, p103. Misdorp, R. & Terwindt, J., 1997: "Coastal Zone Management Experiences in the Netherlands" p233 – 252, in "Coastal Zone Management Imperative for Maritime Developing Nations", editors: Bilal U. Haq, Sayed M. Haq, Gunnar Kullenberg, Jan Stel; Kluwer Academic Publishers , Dordrecht, The Netherlands p 349. Misdorp 2003: "Integrated Coastal Management – the Greater Rotterdam Harbor Area " in Dutch, published by Mens & Wetenschap, Jaargang 30, mei -juni 2003, p170 – 175. Misdorp et al, 2005: "Using Remote Sensing Data for Coastal TT-Hue Province, Vietnam – providing information for Integrated Coastal Zone Management", International Journal of Geoinformatics, Vol.1, No2, June 2005, p103 – 114. Rijkswaterstaat/Delft Hydraulics, 1992: "Global Vulnerability Assessment – Sea Level Rise and Vulnerability assessment for coastal population, wetland, rice production and basic protection costs for 179 coastal nations; Ministry of Transport, Public Works and Water Management & Delft Hydraulics, Revised Edition , January 1993, p 184. Waterman, R., Misdorp, R., Bijlsma, L., De Vrees, L., 1995 : "Rotterdam, Europort-gateway to the 21 th century – Integrated multifunctional sustainable coastal development", CZM-Centre Publication #7, RIKZ, p24 World Coast Conference '93: "Preparing to meet the coastal challenges of the 21 st century" – Conference Report, published by the Ministry of Transport, Public Works and Water Management – RIKZ – P.O.Box 20907, 2500 EX The Hague, The Netherlands, May 1994, ISDN: 90 3690 1448; (www.netcoast.nl). Websites: www.eurosion..org	

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						www.romrijnmond.nl www.netcoast.nl http://www.nea.gov.vn/html/duan/English/VNICZM www.kustnota.nl www.wnf.nl http://europa.eu.int/comm/environment/iczm/home.htm (Robbert Middorp, Senior Advisor of the Netherlands Ministry of Transport Public Works and Water)	
6-29	A	0				Out of the 78 pages, only eight pages are devoted to Adaptation (paragraph: 6.6). Within this Adaptation paragraph only 12 lines (p45) deal with integrated coastal management, being 0,3% of the text of this IPCC Coastal Chapter. And that is really unheard of. After 18 years (1989-2007) of assessing, the IPCC coastal group is presently spending only 12 lines to the adaptive management option: ICZM. This reactive adaptive option was recognized by IPCC as the adaptive option in case that the proactive emission reduction measures were not sufficient. This constitutes a strange discrepancy and inconsistency between the IPCC earlier assessments and this draft FAR! How can this discrepancy be explained? I am not aware that IPCC have changed its strategy towards adaptive responses for coastal areas and have denounced the ICZM approach. Second suggestion : Increase the impetus of ICZM planning and implementation for reducing the CC impacts in coastal nations into the IPCC reporting. (Robbert Middorp, Senior Advisor of the Netherlands Ministry of Transport Public Works and Water)	In the final chapter it will be an appropriate balance We will review the text on ICZM, and resolve contradictions and will also consider linking with the TAR and SAR text on the issue [JH]. We are unaware IPCC has denounced the ICZM concept and will make sure that this is not the case in our chapter. The chapter team endorses the concept see p.45 line 5-7 in the FOD. Moving to policy prescription which we are mandated to avoid.
6-30	A	0				Out of the sixteen CLA's, LA's and CA's, eleven authors are originating from Common Wealth countries and one from a so-called developing country being Mauritius. This strongly unbalanced representation of the more than 180 UN coastal nations has repercussions on the contents of this chapter, such as illustrated in the choices of country-examples in the cases and boxes, and moreover in the western/northern pure scientific character of most of the text. Applied scientific and policy preparative contributions directed to integrated coastal adaptive responses so relevant for most of vulnerable coastal nations (e.g.the low lying developing nations), are missing. Looking at the names of the authors I see many names of scientists and not so many and perhaps not at all of policy-makers. So also here is a misrepresentation.	We are hopeful that any shortcomings in the expertise of the writing team are offset by the contributions from reviewers, and by links to the regional and other chapters.

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						First suggestion Involve more policymakers from coastal developing countries in the next phase of the writing process for this coastal chapter. (Robbert Middorp, Senior Advisor of the Netherlands Ministry of Transport Public Works and Water)	
6-31	A	0				Chapter 6 on coastal systems and low-lying areas is too much emphasizing vulnerabilities and impacts and pays too small amount of attention to the planning and implementation of adaptive coastal measures. Most of the text regarding vulnerabilities and impacts was already dealt with in the previous IPCC Assessments. There is to my opinion not so much need of going in more details on the "science" of impacts. More attention should be spent on the practicalities of coastal management and sustainable development in coastal nations, regions, areas, in order to illustrate developing countries the sustained adaptive road to counteract the effects of Climate Change. Much more cross-references should be made with the work of the WG I and III as well as cross-references in the work of WGII Report itself. (Robbert Middorp, Senior Advisor of the Netherlands Ministry of Transport Public Works and Water)	Chapter plan is mandated from IPCC plenary. However, within these constraints we are actively endeavouring to improve the balance within the chapter and thereby address your concerns. Agree, especially to WGI, and within WGii.
6-32	A	0				Already in the early nineties the "Global Vulnerability Assessment" (Rijkswaterstaat/IPCC 1992) covering 179 coastal countries (Effects of 1 m Accelerated Sea Level Rise on people at risk with and without coastal protection, wetland at change, food (e.g. rice) production losses and basic coastal protection costs) revealed that most of the developing coastal nations will be critical vulnerable. The need for assistance from developed to developing coastal nations in developing adaptive coastal strategies within an ICZM frame is urged in Chapter 17 of AGENDA 21 (UNCED) and is confirmed by UNFCCC. The vulnerable developing coastal nations are being assisted in their ICZM efforts by international, multiple- and bilateral Development Cooperation schemes, such as EC-AID (Morocco, Egypt) and EC-DG Environment (Romania, Bulgaria, Thailand,-), Asian Development Bank (Philippines, Vietnam, Thailand), The Netherlands (Bangladesh, Vietnam, Mozambique), Denmark (Egypt), Sweden (Vietnam). The EC-DG Env. (http://europa.eu.int/comm/environment/iczm/home.htm) have their ICZM demonstration projects in Europe regularly evaluated including benefit cost analyses. The evaluation of November 2000 was in terms of monetary as well as	Will obtain the 2003 report and consider the material for suitable examples [JH]

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						non-monetary term clearly positive. Moreover in the recent past The Netherlands has supported more than 15 developing nations in their effort to complete their National Communications to UNFCCC obligations (Netherlands Climate Change Studies Assistance Program – Ministry of International Cooperation/IVM, Final Report 2003) including coastal Vulnerability Assessments followed by first steps to adaptive ICZM Programme formulation. The USA assisted with its Country Assistance Programme comprising about 50 countries including many coastal counties and was also supporting the UNFCCC process. The developing coastal nations are looking for adaptive coastal measures in an integrated coastal management frame in order to prepare in time for the expected acceleration in sea level rise, increase in storminess and changes in river regimes. A number of developed coastal countries and International Organisations are providing knowledge in the field of adaptive ICZM strategies to developing coastal countries in line with AGENDA 21 and the results of these experiences should be reported by IPCC. Third suggestion : Optimize the input of coastal developing nations into the IPCC coastal reporting process. (Robbert Middorp, Senior Advisor of the Netherlands Ministry of Transport Public Works and Water)	
6-33	A	0				4. A few examples of ICZM practices Two examples of ICZM practices are given to illustrate the importance of integrated management promoting the increase of coastal resilience decreasing the negative effects of Climate Change impacts. The Netherlands The coastal policy of The Netherlands itself, shifted notably from coastal-line protection (Min.V&W 1990) to integrated coastal zone management optimizing the different coastal functional uses. The Netherlands has a long history of managing the coastal zone (Misdorp & Terwindt, 1997). Long term perspectives like of future changes in climate and land-use (Kraak et al, 2002) are being taken into consideration as well as the increase of coastal and riverine resilience (Helmer et al 1999: Growing with the Sea). Three examples of no-regret, sustainable coastal measures and developments in The Netherlands fitting within the ICZM holistic approach are: Since 1990: yearly sand-nourishment of 9 – 12 million m3 (about Euro 50 million/290 km beach coastline; Trends..2002) is a flexible, sustainable, economic	Agree – will consider as examples where there is a clear climate change dimension. Job Dronkers will provide relevant Dutch papers [JH] Worth looking at de Ruig (1998) [RN to JH]

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						justified, effective coastal protection measure (anticipating CC impacts: more SLR more nourishment) supported by yearly systematic coastal monitoring which started in the mid 19 th century. The monitoring and analysis of the state of coast during the Spring provide information for institutionalised decision-making on the nourishment executed during each Summer. The annual beach and fore-shore sand nourishments decrease The Netherlands coastal vulnerability for ASLR by increasing resilience and in the mean time maintaining space for other coastal natural and socio-economic functions (IPCC- Vulner; The creation of a notch ("Kerf"), dug through the outer dunes in a wide dune field in the province of Noord-Holland to increase the dissipation of wave energy during storms and to increase the salt water gradients and biodiversity in the dune landscape. This creation of a notch is a part of an integrated coastal programme by the Working Group: Interdepartmental Vision for the Coast involving four Dutch Ministries: Economic Affairs, Public Housing&Spatial Planning&Environment, Agriculture&Nature Management&Fisheries and Transport&Public Works&Water Management (Bolsius et al, 1999) . Since 1993: the ROM-Rijnmond (= Greater Rotterdam – harbor area) project is being executed during 1993 – 2010, with a budget of Euro 8 billion (10*9) provided by all members being: two Netherlands Ministries, one Province, 18 City Councils, the Rotterdam harbor authorities, representatives of all 600 harbor companies and several NGO's. This integrated long term project focus at the sustainable development of the largest (container) harbor of the world and has strongly improved the quality of the water, air and soil/sediments of the Greater Rotterdam harbor, has increased the areas of greenery for reaction (750 ha), of nature (including increase of biodiversity of flora and fauna - seals are back again, salmons are following), is refurbishing harbor basins into modern urban settlements areas, is going to extend the harbor area with 1000 ha of land-reclamation into the North Sea, and is increasing the economic output, added value and harbor innovations (e.g. automated handling of cargo). The European Commission has indicated the ROM-Rijnmond project in the Greater Rotterdam harbor area is the leading example for the further sustainable development of other European harbors. (Robbert Middorp, Senior Advisor of the Netherlands Ministry of Transport Public Works and Water)	
6-34	A	0				The 19 persons behind this chapter lean heavily on models and model out-put, and pay very little respect to field observational facts. With respect to the assumed future sea level changes, they do not consider the range of IPCC's (2001) estimates	We are mandated to look at the IPCC WGI scenarios. Need to explain in Introduction [RN]

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						(for year 2100) of +9–86 cm, not the mean +47 +/-39 cm, but prefer the manimum value and even an exagurated value of 100 cm. The references do not cover the our bench-mark papers in global sea level records, but are primarilyconfined to the last years' modelling. Out of 503 papers, 97% (477) are from after 1997, 87% (427) from after 2000 and 5% from not yet published papers (14 in press, 12 in review/submitted). This does not concur with normal scientific practice and ethics. Far too many references are to papers by the group members themselfes. All long term (beyond 2100) "predictions" seem not only totally hypothetical but also misleading and driven byan unproductive "maximum frightening" wish. I think we skould stay out of it for the moment. We simply do not yet grasp the dynamics of the variables involved. Better focus on the next 100 years (which are complicated and controversial enough) and at the same time put the Greenland and Antarctic ice caps under a very rigorous monitorin in the field as well as by satellits. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	In terms of referencing, the assessment has been requested to focus on post-2000 publications. The older work has been considered in the earlier IPCC assessments. All papers must be published or accepted for publication by May 2006. If not they will not be cited. We will reduce self-citation where possible [all authors]. We also have no desire to engage in “frightening” policymakers, but it is informative to consider the entire range of plausible climate futures. We will make sure that we will link extreme scenarios with clear statements as to confidence levels. [all authors] These remarks should be taken up by WGI [TSU]
6-35	A	0				This chapter is very good already. I think, more than other chapters I have reviewed so far, it reflects the breadth and diversity of recently published research quite well. As such it is a really good update and reference work since the TAR. What is virtually missing (except for one instance) is a learer and more consistent indication of our level of confidence in what we have learned, and maybe how that has changed over time. Why are you not consistently applying the Moss/Schneider uncertainty categories and descriptors? The one "branch" of literature that I found most lacking is regional work from Africa. While you mention the Nile and Niger deltas several times, there is only one extended example from Africa (also Nile delta), and research on coastal erosion, sea-level rise impacts along the East and West and Southern African coastlines is just not here. A concernted effort to search for that and insert where appropriate will fill this glaring hole. Other, much smaller ones, are listed in their specific instances below. (Susanne Moser, National Center for Atmospheric Research)	Agree We will express uncertainty levels using the IPCC lexicon [all authors] We will look for more African examples, including liaising with the African regional chapter [RS]
6-36	A	0				Additional comments by Magdalena A K Muir on Chapter 6, Coasts and Low Lying Areas	Agree.

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						These comments focus on some general gaps and lacks of emphasis within Chapter 6. While there are also comments on these matters in the excel spreadsheets, these are also issues that would seem to merit greater consideration and inclusion throughout the chapter, and are explicitly raised here. I would ask that the comments here and in the spreadsheets also be considered for other chapters of the IPCC where relevant, particularly Chapter 12 on Europe. Acidification Within Chapter 6, there is a significant absence of any consideration of and reference to acidification, despite its crucial importance for reefs, biodiversity within the oceans, and unknown range of impacts for coastal and marine waters. These are changes to a fundamental part of the ocean carbon cycle, far outside the range of natural variability, that are irreversible and will last for thousands of years. In June 2005, the Royal Society issued a summary report on the effects of CO2 on the pH chemistry of seawater and aquatic organisms and ecosystems. In addition to its pivotal role in the atmosphere in the regulation of global climate, CO2 and its sister chemical species, HCO3- and CO32- comprise the carbonate buffer system which regulates the pH of seawater. Acidifying the ocean is detrimental to organisms that secrete shell material made of CaCO3, such as coral reefs and a type of phytoplankton called coccolithophorids [Kleypas et al., 1999]. Because the fossil fuel CO2 rise is faster than natural CO2 increases in the past, the ocean will be acidified to a much greater extent than has occurred naturally in at least the past 800,000 years [Caldeira and Wicket, 2003]. Royal Society, Ocean Acidification due to Increasing Atmospheric Carbon Dioxide, June 2005. http://www.royalsoc.ac.uk/document.asp?id=3249 Caldeira, K., and Wickett, M.E. Anthropogenic carbon and ocean pH. Nature: 425, 365, 2003. Hoegh-Guldberg, O. Climate change, coral bleaching and the future of the world's coral reefs. Mar. Freshwater Res.: 50, 839-8–66, 1999. Kleypas, J., R.W. Buddemeier, D. Archer, J.-P. Gattuso, C. Langdon, and B. Opdyke (1999) Geochemical consequences of increased atmospheric CO2 on coral reefs. Science 284: 118-120. Climate change and biodiversity There needs to be further and explicit consideration of the interaction between climate change and biodiversity in coastal and marine areas in all aspects of Chapter 6, both because of the value of biodiversity itself, and to support all the ecosystem goods and services that it delivers to local communities, nations and regions. Given the management approach of aspects of this chapter, it is also very	We will increase the content on acidification and coastal biodiversity [CW/VB]

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						important to in some way address the integration of the related obligations and impacts under the Climate Change Convention and the Convention on Biological Diversity. Chapter 10 of the Arctic Climate Impact Assessment Scientific Report focuses on principles of biodiversity conservation in a circumpolar Arctic context, which is one of the regions of rapid climate change. Aspects of this chapter, and principle of biodiversity conservation, are then found in the paper commissioned by the Council of Europe, Conserving European Biodiversity in the Context of Climate Change (M Usher, 2005). This concern over the interaction between biodiversity and climate change was continued in the recommendations of the European Platform for Biodiversity Research Strategy, which were then introduced to a meeting of EU Nature Ministers in October 2005. These recommendations are entitled Recommendations on Climate Change and Biodiversity Conservation: Knowledge Needed to Support Development of Integrated Adaptation Strategies (see www.epbrs.org). It is suggested all this information and principles on links between biodiversity and climate change be considered and integrated in this chapter. Vulnerable coastal ecosystems that can also be used as indicators of and adaptation to climate change Chapter 6 focuses on coasts and on deltas as a particularly vulnerable ecosystem. However, deltas are not the only vulnerable ecosystem. It is also relevant to focus on estuaries, lagoons, enclosed seas, and arctic coasts, which are other examples of particularly vulnerable coastal systems. It is suggest that the chapter refer to all these types of coastal systems when analyzing the impacts of climate change. Some European examples that have been raised in comments are the London and the Thames Estuary, Venice and the Venice laguna, and the enclosed seas of the Adriatic, Mediterrean and Baltic Seas. The Arabian Sea is also another mostly enclosed sea dealing with temperature and salinity increases. The particular vulnerability of arctic coasts, its marine waters, terrestrial and marine species, and local communities was addressed in the Arctic Climate Impact Assessment Scientific Report (2004), and could be further referenced here.. It is also suggested that representative examples of these vulnerable coastal ecosystems be used as indicators of climate change, and to further understand approaches to and effectiveness of adaptation and mitigation strategies for climate change. Other matters It is suggested that there be greater inclusion and discussion of interactions between salinity and temperature, eutrophication, fisheries and climate change in Chapter 6.	

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						For salinity and temperature changes, these are factors that need to be considered in addition to sea level rise and extreme weather events. For eutrophication, in addition to the carbon, there is scope for a consideration of the nitrogen cycle and how climatic changes might affect it. The suseptability of shelf seas to eutrophic response must increase with increasing temperature (leading to more sustained stratification) and increasing freshwater input (delivering more nutrients and leading to more sustained stratification). For fisheries, there are the impacts of temperature and habitat change, some of which might be predicted from physical changes. However, there are more subtle interactions with plants, and impacts of fish species and habitats such as a delta, estuary, lagoon, enclosed sea etc. (Magdalena Ariadne Kim Muir, Arctic Institute of North America (AINA), and EUCC-Coastal Union)	Some rewording of page 23 addresses this point [VB] Shelf and ocean waters aspects and marine fisheries are outside the scope of this chapter. Check Introduction [RN]
6-37	A	0				General comments: This chapter could be much improved to meet the IPCC criteria for 'adding-value' in the review and synthesis of material. Many of the issues in the coastal zone are inter-related with other areas and chapters, and these complexities did not come through in the chapter as it currently stands. Particularly, uncertainty, spatial and temporal complexities/scales and varabilities within systems would merit further attention as well as the interactions between human and natural systems. There are gaps in the literature which have also been highlighted. I also feel that the conclusions could have more teeth and provide more direction for policy makers and governments to act on - be more specific about what sorts of data are required to further measure/monitor or predict changes, what sorts of monitoring and research is still needed - what value would it add? What legislative instruments would benefit from modification. The chapter would also benefit from being punchier with more diagrams and less text - you want to present an engaging, coherent picture of the complexities of climate change in the coastal zone, rather than list points of key research needs. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Agree – will implement as much as possible.
6-38	A	0				General comment 1 -: most informations on climate change within this chapter 6 concern sea level rise which is one of the component and there is very few one concerning the possible change in frequency and intensity of storms and of extrem events as well as possible displacement of cyclonic zones. These phenomena are at regional scale and are more difficult to evaluate. There is less knowledge on that subject but there is some. General comment 2 : There almost no information concerning Africa	Agree – will implement as much as possible.

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						General comment 3 : This document could be improved with more figures and illustrations (LENOTRE NICOLE, BRGM (French geological survey))	
6-39	A	0				Generally the Chapter does a good job of recognizing that the effects of climate change at the coast cannot be considered independent of other coastal stressors. The other message that comes across clear is that there are costs to adapting and costs to ignoring climate change that we now have some estimates of so that economic consequences can be projected. These are strong messages and ground the chapter well. I have some questions regarding the 'quality' of some of the citations. I believe it is inaapropriate to use inaccessible conference proceedings as sources for major points or to cite submitted works. In many instances citations of this type used here are authored by one of the Chapter 6 team. In that case their findings can be presented in the Chapter directly by that author. This reduces the citations and provides a direct contribution from the authors. The next draft must address duplication of concepts (this will reduce length) and the many stand alone sentences or case studies that are not weel integrated into the argument of individual sections. Some of these are identified specifically below. (Denise Reed, University of New Orleans)	Agree Any “grey” literature cited will available though the TSU [see above]
6-40	A	0				General comment: In the guidance notes it is asked: your expertise to assess the quality of the chapter in terms of its structure, content, completeness, insights and added value. Hence more general then a line by line reviewing as suggested by this excel worksheets. However my review will be more general also in view of the fact that the chapter has to be cut down to 30 pages. One general comment: I get strongly the impression that the scaling issue is missing and is in particular important for the sections 6.4 to 6.7 dealing adaptation and implementation of measures. In most cases the discussion is at the global scale and the continent scale at best, whereas implementation through ICZM has to be carried out at the regional and community level. It might be worthwhile for the authors to address the issues involved with implementation at these micro scales. (Wim Salomons, Institute for Environmental Studies. Free University Amsterdam)	Agree – the issue of scale will be reviewed by all authors from the “global” to the local scale [all authors]
6-41	A	0				General comment: complete but over sized. General comment: efficiently structured. (Miltiadis Seferlis, Greek Biotope/Wetland Centre)	Agree
6-42	A	0				This is a well structured chapter. There are very minor issues (and referencing) which will be picked up. I have no substantive comments to make.	Agree

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Charles Sheppard, university of warwick)	
6-43	A	0				This is a very thorough and well-written document. The authors have done a good job of summarizing the results of a wide range of recent research and condensing the relevant points into the required structure of the chapter. I find no major omissions or shortcomings with this chapter so my review will be brief. My primary suggestion may already have been considered by the authors but I feel compelled to raise the point anyway. Similarly, my second suggestion may not be compatible with the required structure of the document but I felt it worth mentioning in case such a change could be accommodated. While this chapter provides an excellent summary of recent coastal research, it is conspicuously lacking in any reference to the recent hurricanes and typhoons that have devastated coastal areas in the Caribbean and South China Seas and Gulf of Mexico. I assume that this chapter had already been written when these storms occurred. However, I feel that their consequences are of such obvious importance that they must be mentioned prominently. Specifically, the impact of hurricanes Katrina and Rita on the U.S. gulf coast, the impacts of hurricane Wilma on the Mexican, Cuban and Floridian coasts and the impact of typhoons Damrey and Kai-Tak on the Vietnamese coast. While most research on the physical impact of these storms has probably not yet been published, much information is available on the expected economic impacts of these storms. Specifically, on the impacts of Katrina and Rita on oil and gas production in the Gulf of Mexico. Given the current lack of excess capacity in global energy markets, the potential future impacts of coastal hazards (particularly extreme events) on gas and oil supplies seem likely to have far reaching economic consequences. Similarly, the impacts of Wilma on the Mexican tourism industry and Damrey and Kai-Tak on the Vietnamese agricultural and aquaculture sectors may be as economically debilitating for these developing countries as Katrina and Rita are likely to be for the U.S.. The authors should seriously consider adding a section to discuss the anticipated economic impacts of these extreme events. At the very least, such a section may draw the attention of policy makers who interpret the report from a perspective of enlightened self-interest. A second suggestion involves the format of the Executive Summary. As written, it seems to combine obvious statements of fact (e.g. 1, 2 & 4), well-known observations (e.g. 3, 6 & 14), less obvious findings (e.g. 9 & 10), and speculation (e.g. 11 & 12). While all are important and justified, the Summary may be easier for readers to digest if the points are categorized (perhaps as above or similarly) with clear distinction between these different categories of findings. It would also	Agree [hurricane standard answer] Will consider recent extreme events listed here and their economic consequences [JH] Agree, but we will follow IPCC lexicon for uncertainty levels. Also the ES will be reorganised and structured into categories as suggested.

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						be useful to highlight the findings that have postdated the previous assessment. (Christoper Small, Lamont-Doherty Earth Observatory of Columbia University)	
6-44	A	0				The repeated references (3, 7; 4, 26-27; 7, 16; 14, 23; 44, 35; 52, 23) to the Indian Ocean (not Asian) tsunami seem unwarranted (but perhaps relate to when the chapter was prepared). Whilst a remarkable event, it was unusual in terms of the combination of the magnitude of the generating event and its location and it is important to keep this in perspective. Hurricanes and cyclones impact coasts and their populations on a much more frequent basis and over a much greater area as page 39 demonstrates (and one wonders about the balance of argument were the chapter to be written now in November 2005). I have no problem with the tsunami being referred to but not continuously and not as the single exemplar of various issues which need to be addressed. In several places in the chapter the statement is made that human pressures on the coast have been and continue to increase progressively and that these pressures are likely to accelerate in the 21st century. These points are illustrated by reference to developing countries. This is fine but one should not give the impression that this is a global phenomenon. If one looks at the coasts of developed countries then the phase of intensive occupation of the coastal zone was completed by the industrial revolution and the problems are quite different, in trying to manage coastlines which have been artifical ones for at least 100 years. One can even track the timing of coastal modification from the timing of agricultural intensification and industrialisation (Europe v. USA for example). And for northern Mediterranean coastlines one might argue that the major phase of catchment degradation, sediment supply and coastal change took place during the Classical period. Muchj of this argument can be centred around changes in sediment supply and its consequences. The varying relations between economic development and environmental degradation and how they relate to coastal processes and coastal management issues should be acknowledged. (Thomas SPENCER, Cambridge University)	Agree – we will consider the climate change dimensions of these statements. [RN/CW/PW]
6-45	A	0				This chapter is in good shape. I like the way it synthesizes results (rather than just enumerating as so many other chapters), adding value (but not, heavens be, adding original research). The tone is appropriate; concerned but not panicky. The mix of natural and social science is quite in order. The choice of case studies is refreshingly representative of the whole world. (Richard S.J. Tol, Uni. Hamburg)	Agree
6-46	A	0				A very quick remark at this stage is that I miss the "Dunes" in chapter 6.4.1: Natural system responses to climate change drivers.	Agree – will add dunes, barriers and non-deltaic coastal lowlands. Will contact

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Frank van der Meulen, National Institute for Coastal and Marine Management/Rijkswaterstaat-RIKZ)	reviewers for reference.[VB]
6-47	A	0				The FOD shows a marked improvement over the ZOD in terms of content and argument. The whole chapter is much easier to read and follow now, and this allows readers to absorb the message much better. The authors should be congratulated on progress so far. The coverage is good now, with a good balance between scientific and social science information and viewpoints. The boxes are generally helpful and give useful case studies. The chapter brings things quite up to date with mention of the Boxing Day 2004 tsunami, but should also cover at least some of the issues surrounding Hurricane Katrina and Hurricane Wilma. For the tsunami there are a number of papers in the journal Science in 2004 which deal with various dimensions of the disaster. There is also a useful Brevia note in a very recent issue of Nature on the different reactions of coastal areas covered with natural vegetation (undamaged) with those that had been subject to extensive human interference (widespread damage). this might back up the point made at several places in the chapter about natural adaptivity. Would it be useful to mention early on questions of magnitude and frequency and scale? I think particularly of the concept of 'large scale coastal behaviour' introduced into the literature by Andy Short and Peter Cowell. The scale at which coastal systems need understanding in respone to global change is quite large for future predictions over decades to centuries (as shown in your example from Woodroffe et al's work on large deltas). Also the notion of 'morphodynamics' which illustrates the natural adaptive respoinse to sea level rise and other drivers (ie as processes change the response varies, leading to feedback between morphology and process) might be worth introducing. I also wonder why you don;t use the term 'sea level rise commitment' to express the concept that whether or not we reduce greenhouse gas emissions now we are committed to sea level rise over 3 centuries or so. What sort of timescales of 'commitment' are there for the other important parameters in table 6.2? Or don't we knkow? This might be quite important for weighing up adaptation vs mitigation strategies in different areas, depending on what factor is posing the greatest threat. The term 'hotspots' might need some explanation. The use of the term 'hotspots' by Nomran Myers within biodiversity research has been highly criticised and means something slightly different. Andrew Goudie has used the term 'geomorphological hotspots' to refer to the sorts of highly sensitive and low resilient natural systems	Agree [standard hurricane response] and we will use the reference. [standard scale response] This point is included, but we deliberately decide to avoid the term commitment because it is ambiguous and has negative connotations. We will make it clear that we are talking about “hotspots of vulnerability” [PW]

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						you list on p. 36 - and this usage is rather different to that of Norman Myers. Coastal vegetated wetlands response to sea level rise depends on sediment supply and topography - this is implicit in this section, but might usefully be made explicit at the start. (Heather Viles, University of Oxford)	Agree and will make clear [CW/VB]
6-48	A	0				I have given the chapter a quick read and found a few editorial suggestions only. The chapter repeats what has been said in the previous reports; thus there is not a lot of new material. But not a lot has changed in the past few years, except that we are more certain of the GCC outcomes. There was not a lot of discussion of the economic impacts of sea level rise on the agricultural base of many low lying communities, especially those on coral reef islands. Salt water intrusion and storm surge will severely damage agriculture on these islands such that the populations will be forced to migrate, because of food and water shortages, not because there is no living space. There was an eclectic use of references – but that is the choice of the authors. Often there could be 5 choices for a statement reference and the authors have used one or two. Other reviewers may pick up on these. (Clive Wilkinson, Global Coral Reef Monitoring Network)	Disagree [add numbers] where published since the TAR. This is covered in Chapter 16 [RM] Noted
6-49	A	0				Finally I want to express that I found the chapter very informative, good structered and having a good quality. (Wilhelm Windhorst, Kiel University)	Agree
6-50	A	1	0			I had made an (informal) review of ZOD of this chapter. FOD looks vastly improved. The suggestions given below are somewhat minor. Firstly, The length of the section on References is about one third of the entire chapter (including references) (Unnikrishnan Alakkat, National Institute of Oceanography)	Responding after chapter
6-51	A	1	0			Following eight references are not listed within comments, (most are available from my homepage): 1. Goklany, IM. 1995. “Strategies to Enhance Adaptability: Technological Change, Economic Growth and Free Trade.” Climatic Change 30: 427-449. 2. Goklany, IM. 1999a. “The Future of the Industrial System.” Invited Paper. International Conference on Industrial Ecology and Sustainability, University of Technology of Troyes, Troyes, France, September 22-25, 1999. Also available in: D. Bourg and S. Erkman (eds). 2003. Perspectives on Industrial Ecology (Sheffield, UK: Greenleaf Publishing), pp. 194-222. 3. Goklany, IM. 2000. “Potential Consequences of Increasing Atmospheric CO2	Not applicable – not coastal

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						Concentration Compared to Other Environmental Problems." Technology 7S: 189-213. 4. Goklany, IM. 2002b. "The Globalization of Human Well-being." Policy Analysis, No. 447 (Washington, DC: Cato Institute, August 22, 2002). 5. Goklany, IM. 2003. "Relative Contributions of Global Warming to Various Climate Sensitive Risks, and Their Implications for Adaptation and Mitigation," Energy & Environment 14: 797-822. 6. Goklany, IM. 2005. "A Climate Policy for the Short and Medium Term: Stabilization or Adaptation?" Energy & Environment 16: 667-680. 7. Goklany, IM. 2005a. "Is a Richer-but-warmer World Better than Poorer-but-cooler Worlds?" 25th Annual North American Conference of the US Association for Energy Economics/International Association of Energy Economics, September 21-23, 2005. 8. Goklany, IM. 2005b. "Integrated Strategies to Reduce Vulnerability and Advance Adaptation, Mitigation, and Sustainable Development," accepted by Mitigation and Adaptation Strategies for Global Change. . (Indur Goklany, Office of Policy Analysis, Department of the Interior)	
6-52	A	1	0			Executive summary does little to provide a 'synthesis' and add-value, as it is presented in as a very long and rather uncoordinated list at present. It would benefit from being structured around a few key themes or areas (such as bullets arranged under a few sub-headings, with 2-3 sentances explaining how the executive summary is organised and how the sub-sections link together). A diagram illustrating key connections/gaps in our understanding would also be more instructive and potentially make the executive summary less unwieldly. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Agree
6-53	A	1	0			Considerable citation by the lead authors (I.e Nicholls) of their own work. This should be re-dressed in subsequent drafts. Other recent references which could re-dress this balance and other comments are: McRobie et al. 2005. Phil Trans Royal Soc 363(1831); Adger et al 2005 Science 309 (5737); Kaya et al 2005. Natural Hazards 36(!-2); Edgar et al 2005. Conservation Biology. 19(4) + marclim refers outlined earlier; Harrison and Wallace 2005. Renewable energy. 30(12) - a subject with little coverage in the chapter; Day et al 2005. Ecological Engineering 24(4):253-; Suarez et al 2005.Transportation research part D. Coastal flooding and urban areas; Roessig et al. 2004. Reviews in fish biology and fisheries. Tompkins and Adger 2004; keating and McGuire 2004. Advances in geophysics; Knogge et al 2004. IBIS 146 suppl 1.;	Agree – thanks for references

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						Pirazzoli et al 2003. Marine Geology 210 (1-4); Hayhoe etal 2004. Proc. of Nat'l Acad of Science 101 (34); Struyf et al 2004. Estuarine coastal and shelf science 60 (4); Lewsey et al 2004 Marine POlicy 28 (5); Wang et al 2004. Journal of climate 17 (12); danard et al 2004. Natural hazards 32 (2). genner et al 2004.Proc of Royal Soc Bio sciences 271 (1539). Borwn and McLachlan 2002. Environmental COnservation 29 (1); Pfizenmayer and von stoch 2001. climate researchg 19 (1). Osterkamp et al 2001. Climate research 18 (1-2); Dippner and Ikauience 2001. Journal of marine systems 30 (3-4). Graham and DIaz 2001. Bull Amer Metero Soc. 82 (9). Tsunami-ecology interactions - Coastal mangrove forests mitigated tsunami [rapid communication] K. Kathiresan, N. Rajendran, pp 601-606, Estuarine Coastal and Shelf Science. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	
6-54	A	1	1	78	8	This FOD is a greatly improved version compared to the ZOD.However, there are still corrections to be made, relating to format, syntax and oversights. Also my comments most of my comments on the ZOD have been taken into account in this FOD. (Bhawan Singh, Université de Montréal)	Agree
6-55	A	1	53			I think that the chapter is well written and compiles an impressive body of cited papers and reports. There are a number of redundant sections throughout the paper of which I have tried to pinpoint a few. I guess such repetition is unavoidable. In some sections like 6.4.1.2 I think that there is a lack of geological/sedimentological/hydrdographical view angles. A final problem is that tsunamis throughout this chapter is described as if it was a consequence of climate change which is not the case. I think this should be mentioned specifiacally. Of course I agree that the consequences fo tsunamis are so similar to those of tropical cyclones that they should both be addressed. I enjoyed reading this chapter. (Morten Pejrup, Institute of Geography University of Copenhagen)	Agree
6-56	A	3	0			storm surges and stron winds may be replaced by strom surges and cyclones(hurricanes) (Unnikrishnan Alakkat, National Institute of Oceanography)	Not applicable –surges are also generated by extratopical storms
6-57	A	3	0			In Executive Summary (no.3), the Indian Ocean tsunami is mentioned. It looks to me irrelevant at this stage of the Chapter, as tsunamis are non-climatic events. (Unnikrishnan Alakkat, National Institute of Oceanography)	We argue that it shows coastal vulnerability
6-58	A	3	0	4		The list of take home messages is good, but - of course - as a long list of points of equal weight, the importance of any one of them gets entirely lost. I suggest that	Agree

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						you take a look at Chapter 18, which summarized its take home messages in a few major messages, and supporting ones beneath that. That will make your summary much stronger and impactful. I think most key messages are there - with a few exceptions, listed below. (Susanne Moser, National Center for Atmospheric Research)	
6-59	A	3	0	4		The executive summary contains too much jargon and is in fact more an abstract for specialists and not a summary for executives (Wim Salomons, Institute for Environmental Studies. Free University Amsterdam)	Agree
6-60	A	3	1	4	27	Executive Summary comment: This section requires major redesign and revision. A list of 25 uncategorized, relatively detailed, and frequently overlapping points will not convey a coherent message to the kinds of people who need, and use, Executive Summaries. I recommend the structure adopted by the Small Islands chapter (16), which leads off with a very brief introductory summary, and then presents its key points as bullets under labeled topical paragraphs that set the context for the individual points. Whatever the organization adopted the content needs to be rationalized to eliminate contradictions and redundancies -- for example: points 3 and 24 are so closely related that they beg to be combined; points 4 and 7 simply say the same thing with reference to different time periods, and point 4 (which mentions benefits) appears to be in conflict with point 17 (which says that there are none). These are examples, and not an inventory, of these types of problems. (Robert Buddemeier, University of Kansas)	Agree
6-61	A	3	1			Executive Summary, too many lists, suggest to itemize them into several categories with short summarry above the listing items (Daidu Fan, Tongji University)	Agree
6-62	A	3	1	4	27	There is an inadequate inclusion of uncertainty. This includes uncertainty in both the climate projections and the socioeconomic scenarios. (Jason Lowe, Met Office)	Agree
6-63	A	3	1	4	27	It is proposed to address separately the impact of long term sea level rise and from short term extreme events (floods, storm). (Klaus Radunsky, Umweltbundesamt GmbH)	Don't understand
6-64	A	3	1	4	27	As has been said on page 6 (6.1.2 Key Issues) The coast is already subject to a range of pressures also without climate change. So glabal change and the impact on a coastal part should not be seen on its own. It should always be investigated in a integrated way taking into account the present problems without global change and on top of that the extra problems due to climate change. To my opinion this is a extremely important conclusion and it should be put in the executive summary	Agree

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						(John Ronde de, Rijkswaterstaat/ RIKZ)	
6-65	A	3	1	4	27	Reduce to 1 page (Qilun Yan, National Marine Environmental Monitoring Center)	Text will be greatly reduced
6-66	A	3	2	4	28	The format of the executive summary is highly unaccepatable. It is poorly written and in a language not amenable to policy makers.It is replete with repetitions and lacks flow and lucidity. I would recommend sub-headings addressing major issues and bullets to provide details.Paragraph numbers 4, 5, 6, 7, 8, 9, 12, 13, 15, 16 and 24 need to be rewritten. (Bhawan Singh, Université de Montréal)	Agree
6-67	A	3	5	3	7	Replace 'dynamic' with e.g. 'vulnerable', and delete the reference to the tsunami, which is not a consequence of climate change and puts the reader on the wrong foot. (Maarten Bavinck, University of Amsterdam)	Not applicable – commernts do not undersntad what we are saying
6-68	A	3	5		7	I propose to remove theses lines : Indian Ocean tsunami of 26 December 2004 was not caused by climate change but was due to tectonic plate. Tsunami is a coastal hazard (LENOTRE NICOLE, BRGM (French geological survey))	Agree
6-69	A	3	6	3	7	There is an unfortunate misperception on the part of some of the public that the Indian Ocean tsunami was caused by climate change. While the chapter is correct in using lessons from that disaster in its assessment of the risks of climate change, a clear statement is needed, both in the Executive Summary and in the body of the chapter (Pg. 7, line 16), that the tsunami was not a climate-related related event, but offers useful lessons for evaluate climate risks. The wording "and other processes" is not sufficent to ensure that this message is understood. (Lenny Bernstein, IPIECA)	Agree
6-70	A	3	6	3	7	"… hazards respectively linked to Earth internal movements and climate variability, as evidenced by the Indian Ocean Tsunami of 26 December 2004 or even more recently the Gulf of Mexico hurricane Katrina". (Yves Henocque, Department of Fisheries)	Agree
6-71	A	3	7			Hurricane Katrina (2005) in the U.S. could also be cited as a very recent and well publicized example of vulnerability to climatic extremes, one more closely aligned with climate change than the tsunami. (Donald Boesch, University of Maryland Center for Environmental Science)	Agree
6-72	A	3	7			suggest you add the following phrase to the end of this sentence: "and Hurricane Katrina impacts on New Orleans". Every place in the text where the Dec 26 tsunami is mentioned, you should also mention Hurricane Katrina and New Orleans.	Agree

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						(Donald Cahoon, Patuxent Wildlife Research Center, Beltsville Lab)	
6-73	A	3	7	3	7	(…) and the hurricane Katrina that destroyed the city of New Orleans. (João Figueira de Sousa, Universidade Nova de Lisboa)	Agree
6-74	A	3	8			"...this will continue…" should be "…this is very likely to……" (Jason Lowe, Met Office)	Agree
6-75	A	3	11	3	14	It is misleading to simply say that it is difficult to link coastal changes to sea-level and climate change and variability. While in some cases, e.g. innudation of low-lying areas due to sea-level rise, the link is clear, in many cases it is impossible to establish cause-effect relationships, due to the complexity of the systems involved and the multiplicity of drivers. This conclusion need to better reflect the limits of our ability to assign specific causes to many of the observed effects. (Lenny Bernstein, IPIECA)	Agree
6-76	A	3	11	3	25	Summary point 4 overlaps substantially with summary point 7 - issues of 'change attribution' in a multi-stressor state blur with the balance of positive and negative consequences of the change. (Sarah Cornell, University of Bristol)	Agree
6-77	A	3	11	3	14	The fourth point in Executive Summary is not explicit (while all the others are) (Are Kont, Institute of Ecology, University of Tallinn)	Agree
6-78	A	3	12	12	14	Replace 'any benefits' with 'most benefits'. In sentence 2, it is not clear what is meant by 'This'. (Maarten Bavinck, University of Amsterdam)	Agree
6-79	A	3	15	3	19	A coastal system is not a living entity and does not change 'its behaviour'. The first sentence is very complicated and could be simplified by referring to externalities on the one hand and internal factors on the other. The second sentence too is confusing: impacts of inter-annual fluctuations are more widely appreciated than what? (Maarten Bavinck, University of Amsterdam)	Agree
6-80	A	3	15	3	18	"Earth system science" language in this point is vague and the important messages about drivers and consequences are lost! Good acknowledgement of progress in physical process understanding (Sarah Cornell, University of Bristol)	Agree
6-81	A	3	18			Executive Summary – decadal not inter-annual (Richard Beamish, Pacific Biological Station)	Deleted
6-82	A	3	21			Note - I printed the document out on US-Standard Paper so line numbers may differ! Point 6, regional differences, suggest adding "results in highly localised and variable impacts" (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Agree

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6-83	A	3	21		22	"with significance for adaptation responses" - this phrase doesn't really say anything, can you rewrite to be more specific or informative in what ways they are significant to [what aspect] of the adaptation responses. (Susanne Moser, National Center for Atmospheric Research)	Agree
6-84	A	3	23	3	25	Summary item 7 seems redundant with summary item 4; also item 16? (Victor Kennedy, University of Maryland Center for Environmental Science)	Agree
6-85	A	3	23		26	What are multiple and concominant stresses, please identify them (Wim Salomons, Institute for Environmental Studies. Free University Amsterdam)	Agree
6-86	A	3	26		29	A remark on impact of damming on sediment supply (external terrestrial influence) to coastal wetlands and increased erosion might be appropriate here. (Wim Salomons, Institute for Environmental Studies. Free University Amsterdam)	Agree
6-87	A	3	27			"other processes" : add such as tectonic up-lift (LENOTRE NICOLE, BRGM (French geological survey))	Disagree – text greatly reduced.
6-88	A	3	28			What is aka? (Hans H.J. Labohm, Netherlands Institute of International Relations 'Clingendael')	deleted
6-89	A	3	28	3	28	Please clarify the wording "precluded by human infrastructure and development AKA" (Klaus Radunsky, Umweltbundesamt GmbH)	deleted
6-90	A	3	30			Might want to include harmful algal blooms and other marine related diseases and (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Agree
6-91	A	3	30	3	34	Coral bleaching was extensively discussed in Chapter 4. It does not need to be discussed in two of the sectoral chapters. Agreement should be reached between Chapters 4 and 6 as to which chapter will cover the topic. The other chapter should include a cross reference. (Lenny Bernstein, IPIECA)	Agree – chapter content has been better coordinated
6-92	A	3	31			Regarding coral bleaching, changes are caused by "near-surface temperature". This is fine. However, in other places in text, for example, page 15, in the Table, "Sea temperature" is used. In some other places sea surface temperature is used . Please use the same terminology. I would suggest near-surface temperature. (Unnikrishnan Alakkat, National Institute of Oceanography)	Agree
6-93	A	3	32			Proposed added sentence : With the increase in mean sea surface temperature there will be developement of coral reefs in new areas (LENOTRE NICOLE, BRGM (French geological survey))	Disagree as Woodroffe has found the potential for this to be limited.
6-94	A	3	33		33	"could"? - is it not a bit more certain that this? (Susanne Moser, National Center for Atmospheric Research)	Agree
6-95	A	3	35			Scenarios can never ‘evidence' anything.	Agree

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						(Hans H.J. Labohm, Netherlands Institute of International Relations 'Clingendael')	
6-96	A	3	35		37	but these coarse-scale analyses hide finer, and important, details, that require a bit of fine-tuning of this take home message (Susanne Moser, National Center for Atmospheric Research)	Agree
6-97	A	3	36			Not sure what development pathways are. Economic jargon? Is it defined in chapter? (Victor Kennedy, University of Maryland Center for Environmental Science)	Agree
6-98	A	3	37	4		Add a recommendation, e.g. between nrs 11 and 12, about the relationship between climate change and poverty. (Maarten Bavinck, University of Amsterdam)	Disagree – for Chapters 19 and 20 to synthesize these points.
6-99	A	3	37	3	37	the acronym SRES should be given in full words (Yves Henocque, Department of Fisheries)	Better cross-reference to Chapter 2
6-100	A	3	38			This should also note that we are in an inter-glacial period, and that sea level has therefore risen & will continue to do so (Anthony Clayton, University of the West Indies)	Will establish a better 20th/21st Century context
6-101	A	3	39	3	41	Sentence 'Hence…atmosphere', is not clear. (Maarten Bavinck, University of Amsterdam)	Agree
6-102	A	3	39	3	39	The following wording is proposed ", although the magnitude of sea-level rise could significantly be reduced by mitigation". Hence it is unclear what impacts are avoided at all and what impacts are just delayed... (Klaus Radunsky, Umweltbundesamt GmbH)	Agree
6-103	A	3	41			Novertheless messions should be reduced (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Not the place for this – other chapters.
6-104	A	3	42		43	Include water supply and quality, and human health sectors (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Agree
6-105	A	3	42	3	43	Rephrase as: The consequences…are critical for fresh water supplies and for human health, but more understanding is required'. (Maarten Bavinck, University of Amsterdam)	Agree
6-106	A	3	46			progress made on evaluting market based goods, less so on the value of ecosystem services and on such things as water quality, biodiversity etc. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Agree
6-107	A	3	46			This will need to be updated in the light of the New Orleans disaster. On the 28th – 29th August 2005, Hurricane Katrina resulted in a 28-foot storm surge as well as torrential rain, the latter raised the height of Lake Pontchartrain by 7.6 feet, and the combination overwhelmed the levees that protected the city of New Orleans. About 80% of the city, which is on average about 6 feet below sea level, was then flooded, resulting in many fatalities and extensive, costly damage.	Agree

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Anthony Clayton, University of the West Indies)	
6-108	A	3	46		49	I don't quite agree with the relevance of the progress made; I think that there is still a lot to do in terms of assessment of capital at risk along the coastal zone and to better understand the multiple and concomitant stresses occurring in coastal areas, which in turn would affect human development in coastal areas and thus the capacity of coastal systems to adapte to climate changes. (Luciana das Neves, Hydraulics and Water Resources Institute | Faculty of Engineer, University of Porto)	Agree
6-109	A	3	46			I was not aware of this substantial progress. There is still much uncertainty. (Hans H.J. Labohm, Netherlands Institute of International Relations 'Clingendael')	Agree
6-110	A	3	46		49	As a stand alone, this message is a bit misleading (and I make that point in the extended text below as well): much remains to be understood on economic impacts (e.g., effectiveness, efficiency, timing of adaptation measures), and so much rides on the typical assumptions that go into economic modeling (e.g., discount rates, "perfect information"). There is also some more recent critique that general equilibrium models - which are most often used - miss the most expensive part: namely what happens during times of a system in disequilibrium. So, this take home message and the underlying text need to be stated more critically, more carefully. (Susanne Moser, National Center for Atmospheric Research)	Agree
6-111	A	3	46		49	Not evident from section 6.5.1 (Wim Salomons, Institute for Environmental Studies. Free University Amsterdam)	Agree
6-112	A	3	49			and intrinsic consequences (ecosystem services)? (Franklin Schwing, NOAA Fisheries Service)	Agree
6-113	A	4	1			This could reference actual estimates from the major reinsurers as to the financial cost of recent hurricanes, especially Katrina (Anthony Clayton, University of the West Indies)	Agree
6-114	A	4	4			The significance of Hurricane Wilma is that we now know that hurricanes can accelerate from category 1 to category 5 overnight. This may reflect the influence of the NAO. There is quite good evidence that we are in the warm part of a long cycle in Atlantic temperature, which might explain why hurricane strength and frequency is rising in the North Atlantic and not elsewhere. However, we then have the additional 0.6 degree rise that is thought to be the result of climate change, so we may be looking at a combination of the two factors. If so, we might have another 5 to 35 years of higher sea temperature in the Atlantic, plus any additional warming + sea level rise due to climate change, which is quite an alarming prospect.	Agree

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						Hurricane Wilma means that we have to revise our models. In particular, we now have to allow for the possibility that a category 1 storm might become a category 5 shortly before making landfall. (Anthony Clayton, University of the West Indies)	
6-115	A	4	5	4	6	Summary 17 is quite similar to 4 and 7. (Maarten Bavinck, University of Amsterdam)	Agree
6-116	A	4	5			Downside prevails in this statement. By the way, I would love to have warmer whether in my country (the Netherlands). It would certainly improve my well-being. (Hans H.J. Labohm, Netherlands Institute of International Relations 'Clingendael')	Agree
6-117	A	4	7			This statement could be articulated better since some could argue that developing countries have the considerable potential to adapt since many have less investment in infrastructure and therefore may not necessarily bare the brunt; also when climate change hits, who will be a developing country - China? I doubt it? (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Agree
6-118	A	4	7	4	7	Suggest that 'developing' be replaced by 'poorest'. (Maarten Bavinck, University of Amsterdam)	Agree
6-119	A	4	7			This too will need to be updated in the light of the New Orleans disaster. The economic consequences relate to the market value of the lost/damaged infrastructure; urban settlements, industrial sites (e.g. refineries, drilling rigs etc), with further economic cost related to e.g. the subsequent rise in the price of oil/gasoline as a result of the temporary loss of some of the production capacity in the Gulf. (Anthony Clayton, University of the West Indies)	Agree
6-120	A	4	7			As above " is very likely" rather than "will" (Jason Lowe, Met Office)	Agree
6-121	A	4	7		12	Reconcile and integrated message 18 and 20. (Susanne Moser, National Center for Atmospheric Research)	Agree
6-122	A	4	7		7	I find this take home message (and the underlying text further down in the chapter) maybe the most objectionable claim. Maybe it would help - even at the level of the Exec. Sum. - to qualify this a bit more. What are the kinds of costs they will bear, and why are they so much higher than (e.g., in highly developed countries that have much more investment exposed right at the shoreline)???? (Susanne Moser, National Center for Atmospheric Research)	Agree
6-123	A	4	7		7	Please explain why (Wim Salomons, Institute for Environmental Studies. Free University Amsterdam)	Agree

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
6-124	A	4	8		10	I don't think that example is particularly contested at all. What's contested is what should be done, what should be prioritized - it's a battle of values underlying local debates and conflicts over these issues. (Susanne Moser, National Center for Atmospheric Research)	Disagree – some people argue that mitigation is the only response.
6-125	A	4	10			this assumes a strong technological adaptation approach, increasing or enforcing buffer zones costs less and a better investment than infrastructure (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Agree
6-126	A	4	10	4	10	should add: "… natural ecosystems and hence to human society on the long term". (Yves Henocque, Department of Fisheries)	Agree
6-127	A	4	11			should specify the types of limits - economic, social, technical??? (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Agree
6-128	A	4	13	4	16	Point 21 is not very clear in its formulation. Also compare with point 6, which is similar in content. (Maarten Bavinck, University of Amsterdam)	Agree
6-129	A	4	13	4	16	It seems somehow strange to assume that the optimal mix between mitigation and adaptation changes with time due to the inertia linked to both concepts. (Klaus Radunsky, Umweltbundesamt GmbH)	Agree
6-130	A	4	17		18	it's unclear what you mean here. Clarify, specify. (Susanne Moser, National Center for Atmospheric Research)	Agree
6-131	A	4	17		18	Unclear sentence (Wim Salomons, Institute for Environmental Studies. Free University Amsterdam)	Agree
6-132	A	4	19			What is meant by adaptation in this chapter? (Victor Kennedy, University of Maryland Center for Environmental Science)	Will be defined in the report.
6-133	A	4	21	4	24	Include "improvements in the warning systems" (Unnikrishnan Alakkat, National Institute of Oceanography)	Agree
6-134	A	4	21	4	24	Point 24 needs rewording, and might be put in a different place. (Maarten Bavinck, University of Amsterdam)	Agree
6-135	A	4	21	4	24	Typo in line 21, and meaning of last line a bit unclear (Sarah Cornell, University of Bristol)	Agree
6-136	A	4	21	4	22	Incomplete sentence (Victor Kennedy, University of Maryland Center for Environmental Science)	Agree
6-137	A	4	21	4	24	Point 24 in the executive summary is not very easy to understand (Heather Viles, University of Oxford)	Agree
6-138	A	4	22			"The increased economic impacts of storm…. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Agree
6-139	A	4	22		24	Very complex long sentence (Wim Salomons, Institute for Environmental Studies. Free University Amsterdam)	Agree

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
6-140	A	4	24		24	What does "a more complex and vulnerable production and living" mean? (Susanne Moser, National Center for Atmospheric Research)	Agree
6-141	A	4	25	4	27	Delete reference to the tsunami in the summary. (Maarten Bavinck, University of Amsterdam)	Agree
6-142	A	4	25	4	26	Suggest deleting reference to Asian tsunami here: or mention more broadly the impact in 2004/05 of global coastal disasters – such as Hurricane Katrina/Rita in the USA (Robert Kay, Coastal Zone Management (Australia) Pty Ltd)	Agree
6-143	A	4	25	4	27	Unclear statement (Victor Kennedy, University of Maryland Center for Environmental Science)	Agree
6-144	A	4	25		27	You make this - almost exact same - statement several times throughout the text, so please search for it, and add in each case after "into wider coastal management" "and development planning" - I think that's actually the larger issue here, but should be spelled out explicitly. The point is a good one, just needs extension. (Susanne Moser, National Center for Atmospheric Research)	Agree
6-145	A	4	25	4	27	Very much agree with conclusion about the need to integrated disaster management and climate variability into wider coastal manangement. I would broaden categories of concerns from tsunamis to hurricanes, tidal surges, wind and water impacts and flooding. Will provide more comments further in text, but might be useful to consider regional responses, i.e., North America, Europe, and circumpolar Arctic. (Magdalena Ariadne Kim Muir, Arctic Institute of North America (AINA), and EUCC-Coastal Union)	Agree
6-146	A	4	25			What about the need to better integrate flood risk, with climate change and disaster management? The need is broader than just climate change and flood risk into wider coastal and land use management (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Agree
6-147	A	4	26	4	27	"…. And change into wider-scale coastal management including observation and warning systems". (Yves Henocque, Department of Fisheries)	Wrong place for this statemnt
6-148	A	4	26	4	27	It is proposed either to delete the text in brackets or to use a more general language. (Klaus Radunsky, Umweltbundesamt GmbH)	Agree
6-149	A	4	26		27	Please omit the reference to the tsunami (Wim Salomons, Institute for Environmental Studies. Free University Amsterdam)	Agree
6-150	A	4	26	4	27	Not just an Asian tsunami (Thomas SPENCER, Cambridge University)	Agree
6-151	A	4	27			And, again, the spate of unusually intense hurricanes in America and elsewhere.	Agree

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Donald Boesch, University of Maryland Center for Environmental Science)	
6-152	A	4	27			insert within the [] after Asian tsunami: "and Hurricane Katrina" (Donald Cahoon, Patuxent Wildlife Research Center, Beltsville Lab)	Agree
6-153	A	4	27	4	27	(…) and the hurricane Katrina in the USA]. (João Figueira de Sousa, Universidade Nova de Lisboa)	Agree
6-154	A	4	30	5	32	Scope statement comment, with implications for the rest of the chapter: There are some disconnects between the stated scope (which I consider reasonable and appropriate) and the actual chapter contents; these are addressed in other comments. A needed clarification in this section is a somewhat more explicit definition of what is being treated as the coastal zone for the purposes of this chapter -- e.g., "physically, from the 100 m isobath to the 20 m elevation contour or 50 km inland from the shorelines of seas and estuaries, which ever is greater/lesser, and socioeconomically including all systems that are contiguous/integrated with entities within the physical coastal zone." [an example -- user can choose terms & numbers, etc.] "Adjoining coastal lowlands" are also unclear, and I would strike the part about 'developed through sedimentation in the last 10,000 years' -- The Yucatan and Florida peninsulas fit my personal definition of a coastal zone or lowland, and owe little other than dissolution to the Holocene. "Landlocked and inland seas" -- The Caspian, Aral, and Dead Seas and the Great Salt Lake are out, but are we drawing the lines among the Red, Black, Mediterranean and Baltic? Based on the text I would assume that any area directly experiencing change due to global eustatic sea level rise would qualify, but that should be made explicit. Comment on chapter with respect to "ecosystem services:" The term ecosystem services is used several times on pp 6-9, and not thereafter until the references section where it is the subject of 3 papers that are not cited in the text (!). Text references to provision or loss of such services are mostly scattered comments about the benefits of vegetation in stabilizing shorelines against erosion and contributions to productivity. [Note: see Danielson et al., Science 310:643, 2005] Sections 6.4-6.7 do not address to any significant degree the the functional or economic losses or gains from changes in ecosystem services, or their replacement. This is a major omission, and in my opinion seriously compromises the completeness and credibility of the chapter, and especially of section 6.5. This is closely related to the handling of ecosystems and climate change impacts thereon, discussed in the following comment. (Robert Buddemeier, University of Kansas)	Accept, but it is difficult to define the coastal zone and low-lying areas in an unambiguous way. We will consider these definitions and the TAR/SAR definitions of the coastal zone, including links to Figure 6.1 (definitional figure) The coastal zone includes all coasts that are subject to global eustatic sea-level rise. Agree – will review these issues, and will add impacts on, and adaptation for coastal ecosystem services and liaise with Chapter 4, including cross-referencing [CW/VB/JH], and possibly Introduction [RN]
6-155	A	4	32	4	38	Should include sea temperature as immediate climatically induced. factor, and equal if not greater importance that sea level rise, which will have greater	155 – Corrected.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						implications in the near and distant future (Magdalena Ariadne Kim Muir, Arctic Institute of North America (AINA), and EUCC-Coastal Union)	
6-156	A	4	33	4	33	...with an emphasis on new insights… (Bhawan Singh, Université de Montréal)	156 – Corrected.
6-157	A	4	38	4	38	"… range of indirect and direct drivers, including…." (Yves Henocque, Department of Fisheries)	157 – Corrected.
6-158	A	4	40	4	40	"… interacting physical…." and not "natural" (Yves Henocque, Department of Fisheries)	158 – Corrected.
6-159	A	4	40			The definition of coastal systems needs improving. What is the spatial limit of the coastal zone for the purposes of this report. This needs to be tightly defined, as people will assume their own definition of the coast which is unlikely to be the same. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	159 – Agreed. See comment 154.
6-160	A	4	43			Vice versa is not very clear: it sounds like oceanic factors are influenced by terrestrial ecosystems. I suspect that what the authors mean is that marine ecosystems are influenced by terrestrial factors (Arnaud Hequette, Université du Littoral)	160 – Agreed. To be corrected.
6-161	A	4	47	4	48	In this sentence and Figure 6.1: not included here are other important drivers such as direct habitatat changes (e.g. filling of wetlands) and various human exploitation of resources, particularly fisheries. These are recognized as important issues for coastal ecosystems. (Donald Boesch, University of Maryland Center for Environmental Science)	161 – Agreed. Figure 6.1 to be revised.
6-162	A	4	47	6	47	Terrestrial sourced hazards are as well river damming and the retention of sedimens, groundwater withdrawl with the effect of subsidence - important especially in large deltas (Klaus Schwarzer, Institute of Geosciences, Coastal and Continental Shelf Research)	162 – Noted. See comment 161.
6-163	A	4	48			Atmospheric influences on coastal systems are overlooked, such as air pollution from the shipping industry [SO4] (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	163 – Noted. See comment 161.
6-164	A	4	48	6	48	A storm is not a marine sourced hazard but an atmospheric sourced hazard. Therefore figure 6.1 should include the interaction of the coastal zone with the atmosphere. (Klaus Schwarzer, Institute of Geosciences, Coastal and Continental Shelf Research)	164 – Noted. See comment 161
6-165	A	5	0			Figure 6.1. I don't really understand the distinction between 'natural system' and	165 – Noted. See comment 161

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						'ecosystem' (or indeed 'human system' for that matter) here. Do youi mean physical system v. biogeochemical v. ecological? It is also a rather odd coastal cross-section; many coasts don't look like this at all. It is not clear what the limits are here (either landward or seaward) (Thomas SPENCER, Cambridge University)	
6-166	A	5	1	5	24	Figure 6.1 is useful but it would help to make a clearer distinction between 'natural system' (sediment and water?) and 'ecosystem'. Or are they really integral components of the same natural system? The external terrestrial and marine influences might usefully be renamed 'events' (if you are referring to the hazards mentioned towards the bottom of page 4. (Heather Viles, University of Oxford)	166 – Noted. See comment 161
6-167	A	5	5	37	38	When the full range of drivers are mentioned it might be appropriate to mention more than just sea temperature rise (Morten Pejrup, Institute of Geography University of Copenhagen)	167 – Noted. See comment 161
6-168	A	5	22			Figure 6.1 - is the 'natural system' distinct from the 'ecosystem'? If 'natural system' refers to the geomorphology of the coast, then I do think the label should be more clearly defined. (Loraine McFadden, Middlesex University)	168 – Noted. See comment 161
6-169	A	5	22			Figure 6.1 -- I find this figure unbelievably non-intuitive and so rudimentary that it says really nothing. Maybe someone graphically proficient can make this a bit more accessible and clear. Also, what are you separating out "natural systems" and "ecosystems" - weird. (Susanne Moser, National Center for Atmospheric Research)	169 – Noted. See comment 161
6-170	A	5	22			Figure 6.1 very poorly illustrates the complexity in and interactions within the coastal zone. Basic omissions: spatial scale of the coastsal zone. Clear demarkation of sea and land is required. Similarly, what is the spatial range of external marine influences? Atmospheric influences/processes. Climate variability as well as change. More complex issues: Why is the natural system separated from the ecosystem? These are now adequately defined in subsequent text throughout the chapter and understanding of the differences is assumed by the authors - but again, readers may not infer this properly. I would revisit the whole 'coastal zone' box in the diagram to better illustrate from of the complexities, interactions and non-linearities associated with the coastal zone. Similarly, I would try to include a temporal dimension in this diagram to illustrate that coasts are dynamic and change. It would also be worth describing what attributes of the human system you are referring to - as the text largely focusses on 'coastal' protection and development pressures rather than land use planning, policy and governance issues which also	170 – Noted. See comment 161

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						are very influential in affecting adaptation of coasts. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	
6-171	A	5	22	5		Figure 6.1 is excellent and it is a pity that it is not used as a template for the chapter. Now the important external forcing (marine and terrestrial) is hidden in various sections of the chapter (Wim Salomons, Institute for Environmental Studies. Free University Amsterdam)	171 – Noted. See comment 161
6-172	A	5	27		32	I find this justification for why we need to look at coastal areas unnecessary. You've only established through three previous assessment reports that they deserve separate attention. Is this necessary? You sound apologetic… don't be! (Susanne Moser, National Center for Atmospheric Research)	172 – Noted.
6-173	A	5	27	5	32	I suggest, that also the increase of shipping activities due to economic globalisation should be mentioned. As this development speeds up the growth of harbours and adjacent industrial areas. This changing use of the coastal zone will increase itsoverall vulnerabbility in economic and in ecological terms. (Wilhelm Windhorst, Kiel University)	173 – Noted.
6-174	A	5	28	5	28	"… productive natural ecosystems and resources… " agriculture and fisheries should be deleted (Yves Henocque, Department of Fisheries)	174 – Corrected.
6-175	A	5	31	5	32	syntax/rephrase (Bhawan Singh, Université de Montréal)	175 – Corrected.
6-176	A	5	37	5	46	Temperature also affects species distributions, with implcations for food webs and ecosystem functions (Victor Kennedy, University of Maryland Center for Environmental Science)	176 – Noted.
6-177	A	5	38	5	41	Avoid the use of semi-colon (;). It is desirable to write small, clear sentences, and when really needed, use the comma (,). (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	177 – Noted.
6-178	A	5	40			add "coastal aquifer" to estuaries and river (LENOTRE NICOLE, BRGM (French geological survey))	178 – Corrected.
6-179	A	5	41	5	41	Effects instead of affects (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	179 – Corrected.
6-180	A	5	41	5	41	"… river systems and groundwater aquifers". (Yves Henocque, Department of Fisheries)	180 – Done. See comment 178.
6-181	A	5	42			suggest adding ecosystems (and the services they provide) (Jacqueline Alder, Fisheries Centre, University of British Columbia)	181 – Corrected.
6-182	A	5	42			there is a tendency to use strong words such as disastrous, which is okay, but perhaps provide the time frames for such disasters. (Richard Beamish, Pacific Biological Station)	182 – Noted.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
6-183	A	5	42	5	43	The sentence would be clearer like this: Low-lying areas and large delta regions in the low- to mid-latitudes are especially at risk. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	183 – Corrected.
6-184	A	5	43		46	comment : In high-latitudes sea level rise is compensated by the glacial rebound which is still actif. As an example in the Northern part of Sweden, there is no coastal erosion (LENOTRE NICOLE, BRGM (French geological survey))	184 – Noted.
6-185	A	5	48	6	3	I would also consider that climate change likely consequence of increasing the frequency of storm events, meaning that even if coastal structures are not submitted to higher wave energy levels they might suffer higher damages (and even collapse) because storm events are occurring ´more close to each other. (Luciana das Neves, Hydraulics and Water Resources Institute | Faculty of Engineer, University of Porto)	185 – Noted. To be checked.
6-186	A	5	48			No such relations is documented in observational datasets – it only refers to models. This is even noted in the TAR-3 report (which I stressed in my expert review that time). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	186 – Noted. To be checked.
6-187	A	5	48	5	50	Long phrase, not very clear, please rephrase. (Miltiadis Seferlis, Greek Biotope/Wetland Centre)	187 – Noted. To be rephrased.
6-188	A	5	49			Some indication of the time frame associated to the phrase 'long term' may be helpful. (Loraine McFadden, Middlesex University)	188 – Noted.
6-189	A	5				Figure 6.1 is not very informative and could be suppressed (Yves Henocque, Department of Fisheries)	189 – Agreed. See comment 161.
6-190	A	6	2			It is not clear by 'storm waves' - More appropriate will be extreme water levels resulting from storm surges and waves (Unnikrishnan Alakkat, National Institute of Oceanography)	190 – Corrected.
6-191	A	6	2			Cite the 2004 South Coast of Cornwall storm as a good example of this shift. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	191 – Noted.
6-192	A	6	3			"farther" rather than "further" (Donald Boesch, University of Maryland Center for Environmental Science)	192 – Corrected.
6-193	A	6	6	6	7	This point is valid, and in the course of chapter 6 it is pointed out that not much has changed to rectify it. I believe there are more social science insights available than are made use of (see my comment 1 above), but that this theme should be taken up again in section 6.8, which it isn't. (Maarten Bavinck, University of Amsterdam)	193 – Noted.
6-194	A	6	6	6	6	delete the word more in 'the more limited'	194 – Corrected.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	
6-195	A	6	7	6	7	"… social or cultural systems;" I don't see the point, culture is inherent to any social system. Mentioning social system is enough (Yves Henocque, Department of Fisheries)	195 – Corrected.
6-196	A	6	16	6	17	I would say the first "syntheses" of the Little Ice Age and Medieval Warm Period, not "explorations", the latter predate the 1970s. Lamb's book published in the 1970's had a long section on these times, providing a synthesis of what was known at that time. Also, the phrase "possibility of an imminent future ice age" could be dropped or it needs to be explained. As I recall, the reason people were talking of going into a new ice age was based on the realization that most interglacials were about 10k yrs long, and that we were approaching that time limit. It was not really based on any cooling trend (except perhaps neoglaciation, as it was then understood). But I think this phrase could be misunderstood by readers who dont remember the context of the 1970s. (Konrad Gajewski, University of Ottawa)	196 – Noted.
6-197	A	6	18	6	18	Well, there was a fair bit known of the pre-instrument record, but it was not well "reviewed" by the 1st IPCC; this is more accurate than saying "not well known" (Konrad Gajewski, University of Ottawa)	197 – Corrected.
6-198	A	6	22	6	11	Replace non-market goods by common pool resources. (Maarten Bavinck, University of Amsterdam)	198 – Corrected.
6-199	A	6	22	6	22	".. Socio-economic and cultural development. Same remark as for line 7 (Yves Henocque, Department of Fisheries)	199 – Noted.
6-200	A	6	26	6	41	The time scale issue needs to mentioned here. Is it decades, centuries, or millenia? The idea of considering rate as a target instead of absolute level is also key. (Jason Lowe, Met Office)	200 – Agreed. To be included.
6-201	A	6	26			Now or from TAR? This is unclear (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	201 – Noted.
6-202	A	6	27	6	41	are there benefits (Richard Beamish, Pacific Biological Station)	202 – Noted.
6-203	A	6	28		42	The external marine and terrestrial influences of figure 6.1 are not mentioned at all (Wim Salomons, Institute for Environmental Studies. Free University Amsterdam)	203 – Agreed. See comment 161.
6-204	A	6	28			not ALL coasts are extensively populated (Thomas SPENCER, Cambridge University)	204 – Agreed. To be rephrased.
6-205	A	6	29	6	31	Coral bleaching gets a lot of visibility in this document, but it isn't the only or the most important coastal ecosystem impact - is it really a more 'key' issue than temperature effects on algal blooms and eutrophication changes which get no	205 – Agreed. To be revised.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						mention here (more comment later) (Sarah Cornell, University of Bristol)	
6-206	A	6	29	6	29	Climate change is not a threat anymore, its real and impacts are visible; So, my suggestion to reformulate as 'Climate change adds further pressure…….' (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	206 – Noted.
6-207	A	6	29		31	Not if one considers long-term Solar variability predicting a new Solar minimum and little ice age in 2040-2050 (Mörner, 2005a; Facts and fiction about sea level changes, Report to the House of Lords, Economic Affairs Comm., 6 pp). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	207 – Noted.
6-208	A	6	29	6	31	higher temperature may lead to toxic algal blooms, and concentrate toxins, pathogens, pollution, sediment, and freshwater runoff within the coastal zone. This is a result of climate change altering the coastal stratification, circulation and wind mixing. (Franklin Schwing, NOAA Fisheries Service)	208 – Agreed. See comment205.
6-209	A	6	34	6	34	Delete literature references in this section of 'key issues'. (Maarten Bavinck, University of Amsterdam)	209 – Agreed.
6-210	A	6	34	6	34	I suggest addition of another reference Singh et.al 2000 (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	210 – NA. See comment 209.
6-211	A	6	34			This paragraph, like much of the chapter, presents a very physical basis for needing a local context. In addition to that outlined, it is local variations in development, economics, willingness, etc that greatly affects our ability to adapt to and/or be affected by climate change. This needs to be made more clearly. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	211 – Agreed. To be revised.
6-212	A	6	35	6	37	See comment no. 4 (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	212 – Unable to response to comment as no. 4.
6-213	A	6	35			"Increased coastal erosion and more extensive inundation" with climate change are certainly key issues, but it should perhaps be added that although coastal erosion will likely increase at most locations, the coastline may be stable or even prograde seaward in some places where the local sediment budget benefits from the erosion of adjacent coastlines (since all the eroded material is not lost for the coastal zone). Several examples of coastline progradation have been documented (some examples being provided in this chapter) even where local sea-level has been rising (presumably because of locally positive sediment budget). Although this is more or less stated later in this chapter, I think that this should be specified at this stage. (Arnaud Hequette, Université du Littoral)	213 – Agreed.

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6-214	A	6	35	6	37	After the semicolon, sentence makes no sense (Victor Kennedy, University of Maryland Center for Environmental Science)	214 – Corrected.
6-215	A	6	37			after 'coastal habitats' consider adding and corresponding ecosystesm services such as food production. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	215 – Corrected.
6-216	A	6	40	6	41	Rephrase sentence as "However, there may be opportunities in some locations." (Maarten Bavinck, University of Amsterdam)	216 – Corrected.
6-217	A	6	41			These are very limited since they are counterbalanced with increased flooding, storms etc. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	217 – Done. See comment 216.
6-218	A	6	41			What are the key issues for/in AR4? How do we need to step change beyond the material in this section? (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	218 – Agreed.
6-219	A	6	46	6	50	Sentence is much too long and is confusing (Victor Kennedy, University of Maryland Center for Environmental Science)	219 – Noted. To be rephrased.
6-220	A	6	47	6	47	Suggested reformulation from 'the dynamics of these systems' to ' their dynamics' (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	220 – Corrected.
6-221	A	6	49	6	49	suggesting deletion of 'or alterations from the trajectory'; simplify understanding (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	221 – Corrected.
6-222	A	7	0	8		It is worth mentioning that increased shore erosion in higher latitudes may occur due to reduced ice cover and strong storm surges in winter even in case where sea level rise is not evident, for instance in the eastern Baltic Sea (Are Kont, Institute of Ecology, University of Tallinn)	222 – Noted.
6-223	A	7	0	18		Nice overview, with good description of human impacts on the coastal zone (Wim Salomons, Institute for Environmental Studies. Free University Amsterdam)	223 – Thanks.
6-224	A	7	3	7	25	As boundary conditions the geomorphology schould be mentioned as well. Wave conditions should be replaced by hydrodynamic conditions which includes also currents. Should the Indian Ocean Tsunami from december 26th really mentioned in a report under IPCC title? A Tsunami by itself is not related to climate. The impact of a tsunami to coast can be mentioned if coasts are changed due to climate change and due to this the tsunami waves are more hazardous to coastal areas. (Klaus Schwarzer, Institute of Geosciences, Coastal and Continental Shelf Research)	224 – Noted. Issue of hurricanes and tsunamis to be resolved for entire chapter to achieve consistency.
6-225	A	7	6	7	6	(...) and the hurricane Katrina in the USA. (João Figueira de Sousa, Universidade Nova de Lisboa)	225 – Noted. See comment 224.

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6-226	A	7	7	24	25	A reference to Lumborg, u. and Pejrup, M (2005) Modelling of cohesive sediment transport in a tidal lagoon - An annual budget. Marine Geology Vol. 218 (1-4) p. 1-16 might be added. (Morten Pejrup, Institute of Geography University of Copenhagen)	1a. Agree
6-227	A	7	9	38	5	Sections 6.3 and 6.4 comment: This was originally occupied with recommendations, and reasons, for reorganizing the sections, written before I realized that there was no choice in the matter (Appendix 4). That changed my opinion of the feasibility, but not of the desirability, of doing so. I have preserved those comments as the last entry in the form, since I think they point out problems with the presentation that can be addressed under the present structure, even though it would be more effective to change it. Basically, there are unnecessary and abrupt transitions between topics, the material does not flow naturally, and there is not a good link -- or a convincing separation -- between 6.2 and 6.4. With the organization as it stands, I think 6.3 needs to be written so as to build explicitly on 6.2 into the topics of 6.4. (Robert Buddemeier, University of Kansas)	Constrained by format set by Plenary
6-228	A	7	11			What are 'natural systems' referring to in this chapter. This is not adequately defined. Here ecosystems are embedded (albeit very weakly!) as part of 'natural coastal systems' yet they are separated in section 6.1. This needs to be more consistent and the more ecological behaviour/dynamics of coastal systems touched on. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	2b. Need to discuss meaning of natural and other terms in context of Fig 6.1 Figure 6.1 will not separate natural and ecosystems.
6-229	A	7	13	6	16	See comment no. 3. Does this section refer to current sensitivity of coastal areas to climate change effects or to natural environmental factors? (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	3. This section refers to natural variability on the coast – no response necessary
6-230	A	7	13	7	16	Yes, however surely it is the fact that the physical system is dynamic but socio-economic constructs are not, which is the real problem (not dynamic physical systems per se). By definition society is a static feature and as a consequence boundaries within the coastal zone are regarded by humans as fixed and inflexible -- this is often how the tragedy is caused. (Loraine McFadden, Middlesex University)	1a. Agree. Will re-assess link between sentences
6-231	A	7	16			add this phrase to the end of the sentence: "and Hurricane Katrina in the Gulf of Mexico" (Donald Cahoon, Patuxent Wildlife Research Center, Beltsville Lab)	1a. Agree
6-232	A	7	16	7	16	Like coral bleaching, the Boxing day tsunami gets several mentions in this chapter, but it isn't really an example of natural coastal dynamic processes that we can expect will change in the context of climate change. It's an analogue for extreme	1a. Agree. Katrina is a better example here

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						climate events, and a salutary lesson about human use of coastal zones... but here, it is a bit of a non-sequitur. This part of the paragraph blurs the issues of natural system change and community vulnerability. Highlighting an example of a major 'external' perturbation (ocean seismic activity) detracts from the punchy points that a lot is known about the controls on coastal system behaviour, some major patterns of variability are understood, and human activity operates on time and space scales that can dominate the effects of natural processes. The rest of the paragraph addresses the key natural system issues much more clearly. (Sarah Cornell, University of Bristol)	
6-233	A	7	16	7	16	"… demonstrated by the tsunami of 26 December 2004 and even more recently by the Gulf of Mexico hurricane Katrina" (Yves Henocque, Department of Fisheries)	See 6-231
6-234	A	7	16			add at the end there the hurricane seasons of 2004 and 2005 (Susanne Moser, National Center for Atmospheric Research)	See 6-231
6-235	A	7	18	7	18	I am unconvinced that the deep past can be used as an analogue for the future. With paleogeographic changes as great as they have been, these times are not really analogues. The use of the distant past is more that models need to be able to simulate them, given appropriate boundary conditions, to be confident they are not overtuned. I think bringing up these analogues is simply leading to more confusion. (Konrad Gajewski, University of Ottawa)	N/A
6-236	A	7	21			add a bit on (sub-annual scales), where most work has been focussed, (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	1a. Agree
6-237	A	7	22			add reference after Donnelly et al 2004: Cahoon et al. in press). The full citation is: Cahoon DR, Hensel PF, Spencer T, Reed DJ, McKee KL, Saintilan N. in press. Coastal wetland vulnerability to relative sea-level rise: wetland elevation trends and process controls. In Verhoeven J., Whigham D., Bobbink R., and Beltman B. Wetlands as a Natural Resource, Springer Ecological Studies series. (Donald Cahoon, Patuxent Wildlife Research Center, Beltsville Lab)	1a. Agree
6-238	A	7	25	7	25	suggesting replacement of 'after' with 'with' climate change (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	1a. Agree
6-239	A	7	27	7	35	Add references to Larcombe & Carter (2005) and Curt Olsen's "equilibrium surface" in estuaries. (Gregg Brunskill, Australian Institute of Marine Science)	3. unaware of these references – will check refs but they appear better elsewhere
6-240	A	7	28			What is meant by thresholds? (Victor Kennedy, University of Maryland Center for Environmental Science)	3. Term commonly used in climate change lit; see section 6.2.4 devoted to this topic
6-241	A	7	28	7	29	Taking systems theory into account, the appearance of emergent structures, which	1a. Agree

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						can happen spontaneeous as result of external stimuli are from my perspective at least as important as "internal thresholds". I assume that the latter term was used in order to take the possible appearance of new structures into account and would like to recommend to add this. (Wilhelm Windhorst, Kiel University)	
6-242	A	7	29	7	31	See comment no. 4 (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	3. Punctuation
6-243	A	7	29			after "stimuli" - can you add an example. That would really help here. (Susanne Moser, National Center for Atmospheric Research)	1a. Agree
6-244	A	7	31	7	35	This reviewer would like to see more precision in the description of what we know about the effect of sea level rise and other factors on coastal erosion. In my Climatic Change editorial (Stive, 2004) I tried to sketch this. Since Bird's observation of global erosion the general opinion has been that sea-level rise plays a role. I agree, but for a long time many coastal scientists (and Leatherman is one important exponent of those) looked at this problem as Bruun did. Due to slr the coastal profile responds by retreat in a cross-shore view alone. This is not leading to a real sediment loss from the coastal barrier, it is a virtual loss. As described later (page 19 line 33) a real loss from the coastal barrier occurs due the infilling of tidal basins, and on many coasts this phenomenon is dominant (not only the Dutch coast, but also the US east coast see Zhang et al, 2004 as discussed by Stive 2004). This is also a reason that Pilkey critizises the Bruun rule. As far as other causes of erosion are mentioned, I like to remark that altered hydraulic forcing (due to climate change) is certainly important, but this changes the patterns of erosion and accretion, it does not cause (in general) real loss of sediment. The impact of human intervention is more complicated, it can be like what I stated for changing hydraulic forcing, but it can also lead to real structural loss, depending on the type of intervention (Marcel Stive, Delft University of Technology, Faculty of Civil Engineering & Geosciences)	2b – This is best addressed on page 19 Accept. We will address in Section 6.4, p. 19 [VB]
6-245	A	7	32	7	32	"… and sea-level rise is often inferred as one of the underlying causes…." (Yves Henocque, Department of Fisheries)	1a. Agree
6-246	A	7	35	7	35	"…. Changes offshore, or reduction of sediments input from rivers (see 6.2.3)" Don't forget that the coastal zone is the ultimate receiving body of the entire watershed inputs (Yves Henocque, Department of Fisheries)	1a. Agree
6-247	A	7	37	8	27	well, all these oscillations and decadal-to centennil changes can also be understood in terms of the concept of Super-ENSO events where the driving mechanism is	3. I think we must defer to WG1 on this. It will be good to assess their view.

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						changes in the Earth's rate of rotation and the interchange of angular momentum (Mörner, e.g. 1995, GeoJournal, 37, 419-430). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	
6-248	A	7	37	8	11	introduction simply (Qilun Yan, National Marine Environmental Monitoring Center)	3. Ignore
6-249	A	7	40			"sea level pressure gardients" may be changed to "pressure gradients at sea level" (Unnikrishnan Alakkat, National Institute of Oceanography)	1a. Agree
6-250	A	7	41	7	44	See comment no. 4. What happened to the beaches in eastern Australia? Which are the rates of cliff retreat on the US-Pacific coast? (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	2a Clarified
6-251	A	7	44			and dramatic beach lowering and loss of beach volumes on US Pacific coast (Thomas SPENCER, Cambridge University)	1a. Agree
6-252	A	7	48	7	48	Pliocene as example of the future. Again, I am not convinced it is a good "analogue: for the future. Just because it was warmer does not mean it will be that similar to the future. The repeated glaciations of the Quaternary have greatly changed the earth surface, as has evolution and changes in the biota. (Konrad Gajewski, University of Ottawa)	N/A
6-253	A	7	52	7	53	What is a "mature state of a warmer world"? (Konrad Gajewski, University of Ottawa)	As 6-252
6-254	A	8	1	8	3	if there is “widespread concern” are there the corresponding number of references. If not, perhaps soften the comment. (Richard Beamish, Pacific Biological Station)	3 There is widespread concern and MANY references
6-255	A	8	5	8	11	typo line 7. This paragraph focuses on ocean changes, but the POL/NOCS/Tyn team have been looking at the implications on coasts of these changes in ocean parameters - storm surge, erosion, etc. Tsimplis et al's latest publication? (Sarah Cornell, University of Bristol)	1a. Agree Tsimplis ref in Phil Trans Roy Soc
6-256	A	8	7			"affecting" rather than "effecting"? (Donald Boesch, University of Maryland Center for Environmental Science)	1a. Agree
6-257	A	8	7	8	7	affecting instead of effecting (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	See 6-256
6-258	A	8	11			The NAO also shifts the salt balance in the north Atlantic, near the sites of deep-water formation. This could alter the thermohaline circulation converor belt. (Franklin Schwing, NOAA Fisheries Service)	3 not relevant to coasts – see 6-255
6-259	A	8	11			and refer to work of Tsimplis et al. (2005) on NAO implications for UK sea level change (Thomas SPENCER, Cambridge University)	1a. Agree – see 6-255
6-260	A	8	13	8	13	Use of abbreviations: There is a lexicon at the end of each Report, but if facilitates	Editorial

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						if the abbreviation is explained the first time it appears in the text. SST = Sea-surface temperature (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	
6-261	A	8	18			should also discuss the 30-60 day Madden Julian Oscillation (MJO) which originate sin the Indian Ocean and has implications for the initiation and amplification of El Nino. These other oscillations need to be supported by referencing. Who defined them? When? (Thomas SPENCER, Cambridge University)	1b. Agree – but beyond scope of this chapter – is it in WG1?
6-262	A	8	19			explain “long lived El Nino-like pattern” (Richard Beamish, Pacific Biological Station)	1b Better definition of PDO would help
6-263	A	8	21			references needed. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	1b Refs for AO and AAO needed
6-264	A	8	23	8	27	The link between the two sentences in this short paragraph is unclear. Perhaps a linking sentence could say something like…. It is difficult to determine, when a particular trajectory of change is detected, the extent to which it is the outcome of human impact or whether it is part of the natural pattern of change. (Loraine McFadden, Middlesex University)	1a. Agree – will reword
6-265	A	8	23			Scant mention is made about the need to decouple natural from human-induced changes in the mix wth all the other parameters influencing coasts. This requires more attention. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	1b – Agree – will reword
6-266	A	8	23	8	27	How might scientists differentiate between different drivers of coastal change? Are we near to being able to do this? Or still woefully in the dark? How might we recognise the synergistic effects of different drivers? (Heather Viles, University of Oxford)	See 6-265
6-267	A	8	25	8	27	The sentence is long. "Much of the world's coastlines are now human dominated. The consequences of these pressures are addressed in the next section." (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	1a, reworded
6-268	A	8	25		25	unclear what you mean by "are now beyond the influence of human pressures" - they seem to me they are fully under that human pressure, not beyond it???? (Susanne Moser, National Center for Atmospheric Research)	1a, reworded
6-269	A	8	30	9	33	This section is short in comparison to others, and might be expanded. (Maarten Bavinck, University of Amsterdam)	1b, Agree
6-270	A	8	30	10	34	In this recital of human utilization & impacts on the coastal ocean, with respect to sea level rise, I would like to see another section inserted to predict the ecological & economic effects (footprint) of the necessary abandonment and landward migration of human settlements and industry that are now at or below sea level. It	2b This question seems especially pertinent in case of New Orleans. Not sure we can generalise on this

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						seem obvious that in some cases, there is nowhere to go, and in other cases, moving Jakarta, New Orleans, Amsterdam, and Bangladesh inland by 50 or 100 miles would displace existing landward ecosystems, agriculture, and social systems. Note that this section limits the discussion to sea level rise, without consideration of increasing heat, humidity, disease-bearing organisms, freshwater supply, and estuarine sewage disposal. (Gregg Brunskill, Australian Institute of Marine Science)	
6-271	A	8	30	9	33	This section is termed 'exacerbating climate risks' but the section fails to make the link between the issues it describes and climate. (Denise Reed, University of New Orleans)	2b I interpret it that these pressures ADD to those of climate change
6-272	A	8	30			My only other comment concerns reference to some of my works in section 6.2.2. Since the publication of the Small & Nicholls, 2003 JCR paper on coastal population, two other relevant papers have been published in this area. Small and Cohen (2004) discusses coastal and deltaic populations in the context of climatic and physiographic environmental factors. Small (2004) supplements the global analyses of population distribution with estimates of urban extent from night light data and discusses distinctions between urban and rural populations. Reprints of these papers are available online at: ftp://ftp.LDEO.columbia.edu/pub/small/PUBS/SmallCohenCA2004.pdf ftp://ftp.LDEO.columbia.edu/pub/small/PUBS/SmallEarthInteractions04.pdf (Christoper Small, Lamont-Doherty Earth Observatory of Columbia University)	1a, add refs
6-273	A	8	32			It would be helpful to the reader to provide an indication on how much coastal populations and their incomes have increased in, say, the last 25 or 50 years (based on data from Keeling & Whorf 2005, available at CDIAC). (Indur Goklany, Office of Policy Analysis, Department of the Interior)	1a, check for ref
6-274	A	8	32			Repetitive with section 6.2.1. One or the other could be effectively reduced. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	3 Cannot see overlap – but will reduce where appropriate
6-275	A	8	32	8	33	an example of the use of the blanket 'human use is increasing' argument with no recognition of regional variations (Thomas SPENCER, Cambridge University)	1a. Agree – good point
6-276	A	8	32	8	39	combination with next part(No.4) and introduction simply (Qilun Yan, National Marine Environmental Monitoring Center)	3 Cannot follow what is meant
6-277	A	8	34	8	34	Should you use "rapid" in the context of a 10000 year "anomaly" (line 31). In general, it seems you are overstating the relevance of the distant past to the question at hand. While there is no doubt that we have to be able to model these periods, and that we can gain insight about the workings of the climate system through their study, the simplistic use of these periods as "analogues" for the future has caused	N/A

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						much confusion in the recent literature. (Konrad Gajewski, University of Ottawa)	
6-278	A	8	34	8	34	Coastal population is not only living in delta- estuary or barrier island areas but as well in normal coastal plains without any river systems. (Klaus Schwarzer, Institute of Geosciences, Coastal and Continental Shelf Research)	1a. Agree
6-279	A	8	35	8	39	See comment no. 4. This sentence could easily be simplified into 3 smaller sentences. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	1a. Agree – reduced to 2
6-280	A	8	36	8	36	the last word 'coast' should be 'coastline' (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	1a. Agree
6-281	A	8	37			low elevation : precise the value (10 m? 20? 50m?) (LENOTRE NICOLE, BRGM (French geological survey))	1a, will endeavour to clarify
6-282	A	8	39	8	39	Add ' In contrast, the trend is opposite in highly populous country like Bangladesh mainly due to exposure to other extreme hazards (Islam 2004)'. The population density in 2001 is 839 per km2 in Bangladesh, this is lower (743) in the coastal zone but much lower (482) in areas exposed to the sea and lower estuaries. (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	3 This is not the sense being conveyed here. All Bangladesh is low in our context here
6-283	A	8	42	9	4	To ecosystem services of mangroves can be added there importance for human communities with regard to provision of firewood, fish etc. (Maarten Bavinck, University of Amsterdam)	1a. Agree
6-284	A	8	44	8	44	Add ' reduces wind velocities during cyclonic storms' (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	1a. Agree
6-285	A	8	48	9	4	Consider less examples of mangrove forests to aquacultures and support the following statement that aquacultures degrade natural ecosystems with reference. (Miltiadis Seferlis, Greek Biotope/Wetland Centre)	1b Is there an appropriate ref?
6-286	A	9	2	9	4	Are the salt marshes being converted to agricultural or urban areas? Please specify. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	1a, both
6-287	A	9	3	9	4	Delete sentence 'Similar reductions…(Kennish, 2001)." (Maarten Bavinck, University of Amsterdam)	3. it is important to include salt marshes
6-288	A	9	3			Insert at the end of the sentence "…ecosystem services (Dahdouh-Guebas et al. 2005)." Full citation is: Dahdouh-Guebas, F., LP Jayatissa, D Di Nitto, JO Bosire, D Lo Seen, and N Koedam. 2005. How effective were mangroves as a defence against the recent tsunami? Current Biology 15 (12): R443-R447.	1a. Agree – will check reference

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						(Donald Cahoon, Patuxent Wildlife Research Center, Beltsville Lab)	
6-289	A	9	6		8	Seems like that is a point worth mentioning in the executive summary. It puts things in perspectives, and will help you make the point of why they are so vulnerable, and why it's so difficult to implement good adaptation there. The economic and political pressures to continue with the status quo will be a major obstacles to dealing with adaptation. (Susanne Moser, National Center for Atmospheric Research)	2b Agree – will add before revising the Executive Summary. [RN]
6-290	A	9	6	9	17	There is also the loss of wetlands and coastal barriers due to changes in river drainage and sediment load (e.g. US Gulf of Mexico). (Franklin Schwing, NOAA Fisheries Service)	1a. Agree
6-291	A	9	8	9	17	Add another bullet 'polderization'. For example, in coastal Bangladesh 1.5 million ha of land has been empoldered in 123 polders by construction of >5000km of embankments. This has happened in many other coastal countries (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	3 This is covered in first dot point
6-292	A	9	9	9	9	Under the bullit points the withdrawl of groundwater in delta areas should be mentioned. It is irrereversible, leads to tremendous subsidence and sometimes support saltwater intrusion. (Klaus Schwarzer, Institute of Geosciences, Coastal and Continental Shelf Research)	1a. Agree
6-293	A	9	9	9	9	Rephrase to "…conersion of natural habitat to agricultural…" (Miltiadis Seferlis, Greek Biotope/Wetland Centre)	1a. Agree
6-294	A	9	13	9	13	What is 'hay' (seagrass?) and hydrocarbon production (oil, charcoal?) (Maarten Bavinck, University of Amsterdam)	3 OK as is
6-295	A	9	18	9	18	Add direct impact of urban development. (Maarten Bavinck, University of Amsterdam)	3 urban development is covered in next paragraph
6-296	A	9	19	9	28	Repetition of p 8, line 32-39. (Maarten Bavinck, University of Amsterdam)	2b This relates to tourism in line 19 – but rest can be reworded
6-297	A	9	19			6.2.2 In Venice,enlargement of inlets and dredging of the navigation channels in the lagoon have produced changes to the lagoon morphology and hydrodynamics that render the city more sensitive to sea level rise and results in increased frequency of flooding. Martini P., D'Alpaos L. and Carniello L. A two dimensional mathematical model for the study of hydrodynamic and sediment transport in the Venice Lagoon in: P. Campostrini ed., Scientific Research and Safeguarding of Venice, Vol. II , CORILA (Venice),2004, ISBN 88-89405-00-7 (Jane da Mosto, CORILA)	3 This is too specific at this point – but Venice could be covered on page 33 or 40
6-298	A	9	19	9	33	combination with above part(No.3) and introduction simply	3 Not clear

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						(Qilun Yan, National Marine Environmental Monitoring Center)	
6-299	A	9	20	9	23	Redundant with page 8, line 36 (Victor Kennedy, University of Maryland Center for Environmental Science)	1a. Agree – reword
6-300	A	9	23	9	33	suggest dropping from line 23 'Most of these large citites…' (Derek Jackson, University of Ulster)	1a. Agree- will reword
6-301	A	9	24	9	26	Sa~o Paulo is not on the coast. It is 760m above the sea level and 120km far from the coast. Perhaps Rio de Janeiro, also in Brazil, would be an example of a large coastal city. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	1a – thanks – don't know how it got into sentence
6-302	A	9	24	9	24	Rephrase to "…and developing states/countries." (Miltiadis Seferlis, Greek Biotope/Wetland Centre)	1b – nations??
6-303	A	9	25			Much of this is covered in the megadelta box. Does it need to be in twice? I don't think so… (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	1a – we need to revisit this topic
6-304	A	9	26	9	26	See comment no. 4 (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	3 Punctuation
6-305	A	9	26	9	28	Delete the sentence 'Dhaka……..2015'. Dhaka is a city in the GBM mega delta but not a coastal city. (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	1a. Agree – OK but relevant to megadelta
6-306	A	9	26	9	28	Reference is needed. (Miltiadis Seferlis, Greek Biotope/Wetland Centre)	3 Reworded
6-307	A	9	28	9	28	See comment no. 4 (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	3 Ignore
6-308	A	9	30		33	I would also include Europe, some examples can be found in the EUrosion Study (www.eurosion.org) (Luciana das Neves, Hydraulics and Water Resources Institute | Faculty of Engineer, University of Porto)	1a. Agree – check refs
6-309	A	9	33			At this place I suggest to add the youngest US experiences in New Orleans, which demonstrates that the interaction between extreme storm event, loss of coastal area, human induced subsidence and lack of preparedness as well as underestimation of ecological risk leads even in highly developed countries to socio-economic catastrophes. (Wilhelm Windhorst, Kiel University)	1b Probably too early but agree New Orleans needs to be in chapter

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6-310	A	9	36			Good to include both terrestrial and marine. Still nothing on atmospheric inputs though. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	1b – Will add atmospheric inputs [CW]
6-311	A	9	36		36	It is meant external coastal influences ??(refer to your own figure 6.1) (Wim Salomons, Institute for Environmental Studies. Free University Amsterdam)	1b – Changing heading [CW]
6-312	A	9	38	9	48	long term deforestation and reforestation in the river basin have great impact on sediment input of river, like Changjiang drainage basin, where deforestation occurred before the 1980s, but reforestation has been successfully and continously carried out since the middle of the 1980s which is concomitant with great reduction in sediment flux. (Daidu Fan, Tongji University)	1a. Agree – ref to deforestation inserted
6-313	A	9	43	9	43	It should be added: ...erosion "in the catchmant areas", otherwise the reader might think about coastal erosion. (Klaus Schwarzer, Institute of Geosciences, Coastal and Continental Shelf Research)	1a. Agree
6-314	A	9	44	9	44	See comment no. 4 (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	3 – semi-colon appropriate
6-315	A	9	45	9	48	syntax/rephrase (Bhawan Singh, Université de Montréal)	1a. Agree
6-316	A	9	45	9	48	Damming and retension of sediments (and silica) can impact coastal waters and their productivity (e.g. damming of Danube and impact on Black Sea biogeochemistry and ecosystem) (Turley, CM (1999) Progress in Oceanography 44, 387-400). (Carol Turley, Plymouth Marine Laboratory)	3 Ref rather dated
6-317	A	9	46			"damming and channeling has greatly reduced the supply of sediments" : is it possible to give an example of value as done just above? (LENOTRE NICOLE, BRGM (French geological survey))	1a. Agree – there are examples in Syvitski ref – but space constrains inclusion
6-318	A	9	47			insert the verb "be" at the end of the line (Donald Cahoon, Patuxent Wildlife Research Center, Beltsville Lab)	1a. Agree
6-319	A	9	47	9	48	Sentence too long. "… retention of sediment in dams (ref). This effect will probably dominate during the 21st century." (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	1a. Agree
6-320	A	9	48			"dominate" not "dominant" (Donald Boesch, University of Maryland Center for Environmental Science)	1a. Agree
6-321	A	9	48			Can you add a sentence here giving reasons why that would be the case? What's the empirical basis for your statement that they will come to dominate in the future? (Susanne Moser, National Center for Atmospheric Research)	1b Accept – add sentence [CW]

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6-322	A	10	1	10	7	See comment no. 3. Tsunamis are more devastating, but they are not related to climate or human-induced changes. Please be very careful when using this fact in this report. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	2b Agree – will change balance and focus on climate. Look in national communications for references on high energy swells that produced impacts [CW]
6-323	A	10	1	10	1	"… by external marine influences alone or in conjunction with terrestrial influences" (Yves Henocque, Department of Fisheries)	3 Either
6-324	A	10	1	10	7	Note that some of these external marine influences are not related to climate change, although some may changes over time in association with it. (Franklin Schwing, NOAA Fisheries Service)	1a. Agree- see 6-322
6-325	A	10	1	10	7	It is not correct to use the general term 'devastation' to compare Thailand and Sri Lanka on the one hand with Seychelels and East Africa on the other (particularly when Sumatra is added almost as an afterthought). This looks more like journalism than the IPCC. (Thomas SPENCER, Cambridge University)	1a. Agree – see 6-322
6-326	A	10	1	10	7	There have been several papers looking at the potential for dramatic influences on coastal change from, for example, sub-sea landslides off the canary islands and also (in today's Nature) on the role of volcanic eruptions in influencing sea temperatures etc. These sorts of episodic high magnitude/ low frequency natural events should be taken into account in future (if possible?) in examining likely future coastal change (Heather Viles, University of Oxford)	2b But are they relevant here – not climate related?
6-327	A	10	2	10	7	An example about tsunami doesn't have direct relation to the problem of climate change influence on coastal systems, so it is necessary to remove it. (Stanislav Ogorodov, Lomonosov Moscow State University)	See 6-322
6-328	A	10	3			We have well documented tsunami events in the past both in Sri Lanka and in the Maldives (internal reports). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	See 6-322
6-329	A	10	4			Maldives were not on the same scale of damage at Thailand and Sri Lanka, suggest deleting Maldives (Jacqueline Alder, Fisheries Centre, University of British Columbia)	1a. Agree – see 6-322
6-330	A	10	6			Tsunamis are mentioned a number of times in the chapter; not always necessary to do so. (Victor Kennedy, University of Maryland Center for Environmental Science)	1a. Agree – see 6-322
6-331	A	10	8	10	9	The first sentence of this paragraph repeats the previous paragraph (Konrad Gajewski, University of Ottawa)	N/A
6-332	A	10	10	10	34	This section is rather weakly argued, and jargon-packed. The definitions - non-	1b Point taken – need to improve wording in

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						linearity, thresholds, emergent properties, external forcings, etc etc, are really needed before page 3, where the jargon first gets used. The specific types of behaviour, threshold and controls should be mentioned in more (coastally relevant) detail - all the physical and natural (eco)system issues are tangled together. If what you are trying to say is that putting a solid groyne or seawall in somewhere causes scouring somewhere else, then make the message about the unintended consequences of interventions clear. Another key point seems to be that there are multiple factors controlling biodiverse systems, and managing just one of these factors won't "scratch the itch". Another point that may be in there but isn't obvious is that the land-side hydrology matters too - changes far within the catchments can change the shape of the coasts (e.g., river interventions affecting tidal angles, etc - one of the Pethick articles mentioned later in chapter refers to coastal effects of re-equilibration of systems with enhanced "swoosh" effect of water and sediment as flood meadows are restored) Line 26 - missing 'of' (Sarah Cornell, University of Bristol)	this section and simplify text so that the key points about threshold responses are made clear. Also explore cross-referencing with other AR4 chapters. May create a table of example thresholds that are relevant to climate change in coasts [VB/CW]
6-333	A	10	10	10	35	In this section it is important to mention irreversible changes and hysteresis. The current definition of thresholds is not wide ranging enough. (Jason Lowe, Met Office)	1a. Agree – see 6-322 – but hysteresis increases jargon!
6-334	A	10	10	1	7	It should maybe me stressed that tsunamis are not caused by global change or any other man-made interferences with nature. It is the vulnerability of the coastal region that is the problem. (Morten Pejrup, Institute of Geography University of Copenhagen)	1a. Agree – see 6-322
6-335	A	10	10	19	20	I do not think that time lag in the erosion-transport-deposition process in the coastal region is the most characteristic feature of coastal dynamics. Rather the opposite. Maybe the reference of Brunsden has to do with the transfer of sediment from land to the coastal region, and there I would agree. (Morten Pejrup, Institute of Geography University of Copenhagen)	1a – will look for additional example
6-336	A	10	10			This section on nonlinearities and thresholds is very important and sets up some points that are reiterated at the end of the chapter. It seems a little lost as section 6.2.4 - suggest making this a higher profile issue. (Denise Reed, University of New Orleans)	2b – Agree – suggest that opening of Section 6.2.1 includes thresholds and also an introduction which shows that the Section is more about pressures on the coast, than the coast itself [CW]
6-337	A	10	13	10	13	Non-linear is not identical to chaotic. Suggestion: Remove 'chaotic' (Maarten Bavinck, University of Amsterdam)	3 OR is meant to imply difference
6-338	A	10	13			add 'local' before anteceedent (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	1a. Agree
6-339	A	10	14			could nonlinearity be introduced earlier as it s closely associated with the natural	See 6-336

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						tendency for climate impacts to be non-random. (Richard Beamish, Pacific Biological Station)	
6-340	A	10	16			as thresholds are crossed and/or due to new emergent stuctures caused by changed interactions in the system. (Wilhelm Windhorst, Kiel University)	1a. Agree – but is additional jargon
6-341	A	10	19	10	20	How long are the time lags in question? Please give a range for this. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	1a. Agree – will try to clarify with examples
6-342	A	10	21			It is not clear how the forest loss example is one of non-linear dynamics - it looks quite simple. The subsequent points about inundation and salinity are not directly related to ecological change. One point that could be made here is that trees / shrubs / herbs are likely to respond in different ways and at different rates to changes in environmental controls. (Thomas SPENCER, Cambridge University)	2b Agree – will explain better including new table [CW/VB]
6-343	A	10	22	10	24	How are the two observations in this sentence related? Thresholds of what? (Victor Kennedy, University of Maryland Center for Environmental Science)	See 6-342
6-344	A	10	22	10	24	This example on the loss of coastal forests should be amplified -perhaps a small box. This would help highlight the non-linearity issue but also provide a substantive example - without more detail here the reader has no concept of how important or well defined these thresholds might be. (Denise Reed, University of New Orleans)	See 6-342
6-345	A	10	22	10	24	syntax/rephrase (Bhawan Singh, Université de Montréal)	1a. Agree will reword
6-346	A	10	26	10	34	This para can be deleted as it contains no additional information (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	3 will reword
6-347	A	10	26	10	34	The greatest challenge will be to examine the integrated (physical and human) system. How can we best manage the coast when physical and human components of the system have different intrinsic thresholds in response to forcing? (Loraine McFadden, Middlesex University)	2b good point – We will add human systems here – will include human examples in the new table in Section 6.2.4 [CW/VB]
6-348	A	10	28		31	I agree with the sentence but what is the cost of getting this right versus bad management. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	1a. Agree- will reword
6-349	A	10	29	10	30	replace list with generic term for driving factors (Derek Jackson, University of Ulster)	See 6-348
6-350	A	10	32		32	"is also important to community planners" - well, it maybe should be, but it often is not yet at all!!! This should be stated more carefully. (Susanne Moser, National Center for Atmospheric Research)	1a. Agree – will reword

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6-351	A	10	34			Is more work needed in this area? If yes, be more explicit (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	See 6-348
6-352	A	10	39		46	Verymuch psycology seems to be involved in the interpretation. Other data show th oposite. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	1a. Agree - reword
6-353	A	10	39	10	44	The case studies described may be at different time and space scales - the current text doesn't support the assertion that they 'indicate the difficulties involved'. There is an inference here that att shoreline erosion or wetland loss at the coast may be climate change related - such generalisations dilute the import of the really clear cases. (Denise Reed, University of New Orleans)	1a. Agree – reword
6-354	A	10	39			What governs the choice of examples here? Why deal with individual locations? Regional summaries would be more useful. (Thomas SPENCER, Cambridge University)	1a – examples were chosen because there are papers in the literature – will reword
6-355	A	10	43		44	add : or climate change (intensity and frequency of tempests, extreme events) (LENOTRE NICOLE, BRGM (French geological survey))	1a. Agree
6-356	A	10	44	10	44	Add 'subsidence' between level rise and or (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	3 – subsidence is included in the term relative sea level
6-357	A	10	48			Also studies in Canadian Arctic show thining winter ice - e.g. Meier et al. 2005. EOS 86:326-327 (Jacqueline Alder, Fisheries Centre, University of British Columbia)	3 EOS not widely available
6-358	A	10	48		49	This is unfounded ideas. We need much more work based on well-documented observations in the field. Also, peer-reviewed articles. The data referred to are preliminary and hypothetical. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	3 The references cited record this coastal change – as also ref in 6-357
6-359	A	11	1		7	Even IPCC (2001) gave little or no contribution from Antarctica (-0.10 mm/yr) and Greenland (+0.05 mm/yr). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	3 Coastal melt is documented along Antarctic coast. This is not about overall melting – note second clause qualifies the point
6-360	A	11	3	11	4	Please change positive effects on tourism, because growth of the number of torurists in an area can and is in some regions already negativ in terms of ecological and economical sustainability. (Wilhelm Windhorst, Kiel University)	2b – we have tried hard to find positive effects and this effect is documented -- will add reference.
6-361	A	11	4	11	4	change to: "such as longer tourist seasons (Madison 2001)…" (Maarten Bavinck, University of Amsterdam)	1a. Agree
6-362	A	11	6			could be more specific in reference to sea ice cover - since it is both spatially and temporarilly reduced	1a. Agree – will refer to Polar chapter

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						(Jacqueline Alder, Fisheries Centre, University of British Columbia)	
6-363	A	11	9	11	20	The paragraph on melting water ice might also include changes in the thermal stability of gas hydrates on continental shelves and slopes. This section seems curiously limited to shoreline processes, and does not consider the continental shelf. (Gregg Brunskill, Australian Institute of Marine Science)	3 This is a chapter on coasts – will check with polar chapter
6-364	A	11	10	11	11	The cause-effect implied in 'mean a greater potential for wave generation' is not clear - only the reduction in sea-ice cover seems to relate to this outcome. (Denise Reed, University of New Orleans)	1a. Agree
6-365	A	11	12	11	12	leads to rapid coastal erosion' is too blanket a statement. Avoid such generalizations. (Denise Reed, University of New Orleans)	1a. Agree
6-366	A	11	12	11	14	Melting of permafrost may result in release of methane, from methane clathrates, to the atmosphere and therefore add to greenhouse gas global warming or/add to impact on the oceans - another non-linear effect or tipping point. This may have happened rapidly 55 millions years ago (at the PETM) and caused mass extinctions (Zachos et al. (2005) Science, 308, 1611-1615). (Carol Turley, Plymouth Marine Laboratory)	2b – Outside the scope of this chapter
6-367	A	11	18	11	18	See comment no. 4 (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	3 Ignore
6-368	A	11	18	11	19	5% is true for 30 years, but if a different base is used, this can go the other way. Suggest picking a longer time frame, not one that opens the report to criticism as showing intent to be alarmist. (John Everett, Ocean Associates,Inc.)	2b – check with Don Forbes – polar chapter
6-369	A	11	18	11	20	The example of Bering Sea is unsuitable for middle latitudes. First, this sea is closer to arctic seas by its environmental characteristics. Second, 30 years observation period isn't representative enough for the long-term forecast. (Stanislav Ogorodov, Lomonosov Moscow State University)	2b – check with Don Forbes – polar chapter
6-370	A	11	18	11	20	When you include in the the first paragraph of page 11 possible positveveconomic benefits, then it should be mentioned here the an open Bering would be of enormous importance for the shipping industry between Asia and Erurope, especially if the growing international devison of labour is taken into account. (Wilhelm Windhorst, Kiel University)	1a. Agree – useful point
6-371	A	11	19			The rate of Bering Sea ice reduction has increased in recent years, and now some areas are ice-free year-round. (Franklin Schwing, NOAA Fisheries Service)	1a. Agree
6-372	A	11	22	13	4	This brief view of climate change effects on coral reefs does not mention acidification from carbonic acid of coastal ocean water, due to increased oceanic	1b – correct – will need to be reconsidered as part of cross-cutting theme

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						uptake of fossil fuel carbon dioxide from the atmosphere. Many recent references are available for this. If continental seas experience surface layer warming, then it will be harder to mix surface waters with cooler deep water, and upwelling along coral reef margins will decrease. These physical and chemical oceanographic changes may affect corals directly. Changes in shelf margin pH are briefly mentioned on p. 23, in a different context, but lacking many references to the measured effects of increased pCO2 on biota. (Gregg Brunskill, Australian Institute of Marine Science)	Acidification does need addressing
6-373	A	11	22	11	32	Coral reefs as indicators of climate change. There has been a little bit of work on other marine/coastal biota and climate change that could be worth mentioning. The TAR briefly mentions the possible temperature effects on algal blooms, and since then, there has been some work through Europe's ELOISE/BASIC and HABES programmes e.g., on the Baltic exploring this (Stal 2003 - but anthropogenic nutrients still prove to be the big controller), and some elsewhere (at U Washington -Nelson? Australia? Cindy Heil's 2005 paper for eastern seaboard). Algal blooms have impacts on tourism and also on other organisms (up through trophic levels) Key issues, of course, are the multiple stressor effects - as for corals, so temperature relationships rarely get the impact of eutrophication studies. Also Miller AJ et al, 2003 (Sarah Cornell, University of Bristol)	1b – agree – need general comments on biodiversity in 6.2.5
6-374	A	11	22	13	4	Here and elsewhere, the coral sections are reasonably balanced and do mention expansion of range and new host/new algae as adaptations, but still stress bleaching to excess (to me). It would be useful to mention that even the warmest marine waters have corals, usually of the same species groups as those being bleached. It is the amount and suddeness of the CHANGE as much as the temperature that causes bleaching. (John Everett, Ocean Associates,Inc.)	1a. Agree – will consider in re-assessment of coral
6-375	A	11	22	13	4	coral bleaching is described in several chapters (chapters 1, 4, 6 and each regionel chapters (e.g. chapter 11, page 15, lines 9-29)), but seems not to be referred to with each other. I agree that bleaching is the most important signature of the global warming, and should be appeared in several chapters. However, within the limit of pages, they can be integrated in some parts, or at least referred to with each other. (Hajime Kayanne, University of Tokyo)	Yes - - see 6-372
6-376	A	11	22			Section on coral reefs. Added value is needed here. Focus is on corals themselves rather than the services corals also provide to other things. For example, the flood risk implications of coral bleaching and death are not noted - nor the need for more work in this area.	OK see 6-372

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	
6-377	A	11	22		32	There is no mention of the possible development of new coral reef zones with the increase of mean sea surface temperature (LENOTRE NICOLE, BRGM (French geological survey))	3 – there is – see page 26, line 25
6-378	A	11	25	11	25	See comment no. 4 (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	3 ignore
6-379	A	11	27			Tomascik et al. Study of pollution from Jakarta Bay onto offshore reefs might be useful here (Jacqueline Alder, Fisheries Centre, University of British Columbia)	1a. Agree
6-380	A	11	27			It is not clear why overfishing would exacerbate these effects. (Denise Reed, University of New Orleans)	3 This is dealt with in Pandolfi ref (herbivore removal)
6-381	A	11	27			and sediment and pollutant impacts (Franklin Schwing, NOAA Fisheries Service)	1a. Agree added.
6-382	A	11	30	11	30	See comment no. 4 (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	1a. Agree-; replaced by .
6-383	A	11	35	13	4	The example of coral bleaching (Box 6.1) is associated with El Nino events, which are cyclic and don't connected straightly with global climate changes. Moreover, as is well known, corals survived Pleistocene-Holocene sea level oscillations and Holocene climatic optimum. Coral destruction is an important source of beach sediments and, as a result, atolls forming. I consider section 6.2 could be abridged by removing this box. (Stanislav Ogorodov, Lomonosov Moscow State University)	3 We need to re-assess how corals are treated – but this is a very important issue and the box is crucial
6-384	A	11	35	12	48	Box 6.1 can be shortened. It is an extensively commended issue. (Miltiadis Seferlis, Greek Biotope/Wetland Centre)	3 – It is discussed so much because it is so important
6-385	A	11	35	13	3	Surprised no mention of high ocean CO2 here and therefore impact on calcification of coral and synergistic impact with bleaching on corals. Check Royal Society report for details (http://www.royalsoc.ac.uk/document.asp?id=3249). This is probably as serious as coral bleaching as there is concern that corals may not survive in a high CO2 ocean. (Carol Turley, Plymouth Marine Laboratory)	1a. Agree – yes – acidification needs more balanced treatment, see 6-372
6-386	A	11	35	13	4	Reduce to within 1 page (Qilun Yan, National Marine Environmental Monitoring Center)	See 6-372
6-387	A	11	36	13	3	I find this box altogether too long, and could imagine removing it. (Maarten Bavinck, University of Amsterdam)	See 6-372
6-388	A	11	36	13	4	This information duplicates information presented in Chapter 4. The duplication is not justified. Chapter's 4 and 6 should agree on which chapter will cover coral bleaching. The other chapter should provide a cross-reference to the material.	See 6-372

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						(Lenny Bernstein, IPIECA)	
6-389	A	11	36			Comment on Box 6.1 and Table 6.2 on p. 15 (2nd row, regarding corals). It should be noted that some studies have measured a net increase in the growth rate of coral at higher temperatures [see, e.g., Carricart-Ganivet, J.P., 2004. Sea surface temperature and the growth of the West Atlantic reef-building coral Montastraea annularis. Journal of Experimental Marine Biology & Ecology 302: 249-260]. A modeling study undertaken by McNeil et al. (2004) to account for changes in the coral calcification rate due to both the saturation state of CaCO3 in seawater and the sea surface temperature suggests that annual average coral reef calcification rates will increase with future ocean warming and eventually exceed pre-industrial rates by about 35% by 2100. Their results suggest that present coral reef calcification rates are equivalent to levels in the late 19th century and does not support previous suggestions of large and potentially catastrophic decreases in the future. [Ref: McNeil, B.I., R.J. Matear & D.J. Barnes, 2004. Coral reef calcification and climate change: the effect of ocean warming. Geophysical Research Letters 31 L22309, doi: 10.1029/2004GL021541.} [See also Riebesell, U. 2004. Effects of CO2 enrichment on marine phytoplankton. Journal of Oceanography 60: 719-729.] See also comment 13. (Indur Goklany, Office of Policy Analysis, Department of the Interior)	1a. Agree – these are important comments, and will be taken into consideration
6-390	A	11	36			More recent references are required in box 6.1. The length of this box could be reduced. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	See 6-372
6-391	A	11	37			A large new body of literature of long-term records and recent studies of biological communities on rocky coasts has been missed. This work has been concentrated in the UK and the west coast of America. They have demonstrated large range extensions in populations - arributed to SST rather than just SLR. This literature needs to be represented in this chapter. This would also enable an assessment of changes rather than 'threats' and some more added value about the effects these changes may have on things like productivity, fisheries, implementing and regulating national and international legislation as well as long term trends for the fate of the species which are extending their range. Sample references are: Southward, A.J., Langmead, O., Hardman-Mountford, N.J., Aiken, J., Boalch, G.T., Dando, P.R., Genner, M.J., Joint, I., Kendall, M., Halliday, N.C., Harris, R.P., Leaper, R., Mieszkowska, N., Pingree, R.D., Richardson, A.J., Sims, D.W., Smith, T., Walne, A.W., Hawkins, S.J., in press. Long-term oceanographic and ecological research in the western English Channel. Advances in Marine Biology.	2b Agree. This is important – will add a Hawkins et al (2003).

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						Genner, M.J., Sims, D.W., Wearmouth, V.J., Southall, E.J., Southward, A.J., Henderson, P.A., Hawkins, S.J., 2004. Regional climatic warming drives long-term community changes of British marine fish. Proceedings of the Royal Society of London, B,271, 655-661. Hawkins, S.J., Southward, A.J., Genner, M.J., 2003. Detection of environmental change in a marine ecosystem – evidence from the western English Channel. Science of the Total Environment, 310, 245-246. Herbert, R. J. H., Hawkins, S.J., Sheader, M., Southward, A.J. 2003. Range extension and reproduction of the barnacle Balanus perforatus in the eastern English Channel. Journal of the Marine Biological Association of the United Kingdom, 83, 73-82. BURROWS, M.T., MOORE, J., & JAMES, B. 2002. Spatial synchrony of population changes in rocky shore communities in Shetland: implications for monitoring. Marine Ecology Progress Series (In Press). MIESZKOWSKA, N., KENDALL, M.A., LEWIS, J.R., HAWKINS, S.J., LEAPER, R. & SOUTHWARD, A.J. Long-term change in the distribution and relative abundance of intertidal organisms in the English Channel: the effect of 40 years of climate fluctuation. Journal of the Marine Biological Association of the UK. POLOCZANSKA, E.S., BURROWS, M.T., & HAWKINS, S.J. (In preparation). Climate change and competitive interactions in intertidal barnacle populations: models built on 40 years of evidence. Journal of Animal Ecology. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	
6-392	A	11	46			It is not clear why branching species would be more susceptible than massive. (Denise Reed, University of New Orleans)	3. The literature does document this effect
6-393	A	12	0			This was an event (ENSO) and reveals absolutely no trend (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	1a. Agree – will re-examine wording. There seems to be a trend in the events
6-394	A	12	9	12	10	Here and several other places, add something like: after ….. gases--and as the Sea Level continues to rise, as it has since the end of the last ice-age. (John Everett, Ocean Associates,Inc.)	N/A? – is this this chapter?
6-395	A	12	20	12	21	What date is the base period? Is this a long enough period for credibility of the document? (John Everett, Ocean Associates,Inc.)	N/A? – is this this chapter?
6-396	A	12	24	12	27	Sentence too long. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	1a. Agree –reworded slightly
6-397	A	12	24			Was bleaching really the most extensive on record or just the most	3 It was the most extensive on record

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						comprehensively reported on record? (Thomas SPENCER, Cambridge University)	
6-398	A	12	27	12	35	References are needed to support these statements (Thomas SPENCER, Cambridge University)	1a. Agree – see 6-372
6-399	A	12	31			The recovery process here should be explained. The use of the term 'died' on line 29 doesn't imply recovery. Is it recolonization? (Denise Reed, University of New Orleans)	See 6-372
6-400	A	12	32	12	35	Sentence too long. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	1a. Agree – reworded slightly
6-401	A	12	35			There should be a link to future ENSO changes. (Jason Lowe, Met Office)	1a. Agree
6-402	A	12	38	12	48	delete lines and insert Rowan (12004) reference at end of an expanded line 25 (Derek Jackson, University of Ulster)	3 I believe this important given significance of bleaching
6-403	A	13	1	13	4	delete lines (Derek Jackson, University of Ulster)	See 6-402
6-404	A	13	1			"susceptible to seawater warming" need to precise that it is a rapid warming (as El Nino) (LENOTRE NICOLE, BRGM (French geological survey))	3 It is temperatures that exceed seasonal maximum that are of concern – details are elsewhere
6-405	A	13	5			Lagoons can also be considered "sentinels" of climate change processes. This was considered in detail in: Eisenreich, Stephen J. (2005) (Ed) Climate Change and the European Water Dimension EUR 21553 EN, European Commission, where a chapter on Venice is presented http://ies.jrc.cec.eu.int/fileadmin/Documentation/Reports/Inland_and_Marine_Waters/Climate_Change_and_the_European_Water_Dimension_2005.pdf (Pierpaolo Campostrini, CORILA)	3 Venice lagoon is unique – and this is not the best place for it – perhaps page 33 or 40?
6-406	A	13	7	19	5	It is logically to interchange sections 6.3.1 and 6.3.2. (Stanislav Ogorodov, Lomonosov Moscow State University)	2b People and their activities cause climate change and sea-level rise
6-407	A	13	9	13	10	It should be mentioned that anticipated sea level rise through the 21st century will not be caused only by human activity but also by natural forcings, although we do not know the exact proportions of these components today (Are Kont, Institute of Ecology, University of Tallinn)	Agree
6-408	A	13	10			I'm not clear if "...superimposed….." is the correct term. It implies to me an independence between the climate change and evolving coastal system. In fact the two will be linked. (Jason Lowe, Met Office)	From a systems perspective a useful distinction so CC effects can be quantified, although in some ways the remark is correct.
6-409	A	13	10		10	cite Wigley 2005 (paper in science) at the end of that first sentence.	Agree

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Susanne Moser, National Center for Atmospheric Research)	
6-410	A	13	11	13	14	Sentence too long. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Agree
6-411	A	13	13	13	13	change 'strongest' to 'strong' (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	Agree
6-412	A	13	15		17	It sounds like "maximum frightening". (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Reject – factual statement
6-413	A	13	15			Nore sure this relates to Figure 6.1 as suggested. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Agree
6-414	A	13	19	13	30	cancel (Qilun Yan, National Marine Environmental Monitoring Center)	Reject – add reference to support
6-415	A	13	23			SRES is not defined or explained, but I guess this is done in Chapter 2. (Gregg Brunskill, Australian Institute of Marine Science)	Glossary and cross-reference issue
6-416	A	13	23			Is SRES defined anywhere? (Franklin Schwing, NOAA Fisheries Service)	Glosary and cross-reference issue
6-417	A	13	23	13	23	...which comprise… (Bhawan Singh, Université de Montréal)	Link to Chapter 2
6-418	A	13	28			if there has been 'considerable debate' on the SRES scenarios then this should be referenced so that the reader can go to this literature and form their own judgement. As it stands the text is too uncritical. (Thomas SPENCER, Cambridge University)	Use Chapter 2
6-419	A	13	32	13	34	own-tail-eating first line! (Sarah Cornell, University of Bristol)	Deleted
6-420	A	13	32			Very hypothetica. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Deleted
6-421	A	13	34			...considered where? (Victor Kennedy, University of Maryland Center for Environmental Science)	Deleted
6-422	A	13	34			How far into the future do these scenarios need to be considered? (Jason Lowe, Met Office)	Deleted
6-423	A	13	37			check repetition with ch2. X-refer and reduce text here if possible. This section just outlines SRES. It doesn't critique them or explain how they can be applied. This is ideally what should happen in this chapter rather than outlining what they are (which can be done elsewhere) (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Agree
6-424	A	13	39		42	Most important is the Sun. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Reject – WG 1 issue

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
6-425	A	13	42	13	42	Abbreviation: GDP = global development patterns? Please explain. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Agree
6-426	A	13	48	13	50	too UK-biased (Thomas SPENCER, Cambridge University)	Agree: add non-UK references
6-427	A	13	49	13	50	"expansion of tundra over the northern continents". Is this really the case? In North America, I am under the impression that tundra was not geatly expanded, except perhaps in Alaska. But south of the Ice Sheet, the tundra was only a narrow band (Konrad Gajewski, University of Ottawa)	Wrong chapter
6-428	A	13	50			Should be flood risk rather than flood defence (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Not correct
6-429	A	13				this is nicely done (Richard Beamish, Pacific Biological Station)	Thank you
6-430	A	13		19		This discussion of "assumptions about future trends" is concerned only about sea level rise, and does not cover all of the other temperature and carbon dioxide effects on the physics, chemistry, and biology of the coastal zone. Table 6.2 mentions some of these climate change drivers, which are not discussed or analyzed in the text. (Gregg Brunskill, Australian Institute of Marine Science)	Accept and will be as comprehensive as possible, within the literature include sea temperature and storm models.
6-431	A	14	4	14	4	Remove 'detailed' (Maarten Bavinck, University of Amsterdam)	Agree
6-432	A	14	13		17	Table 6.1 - it would help the reader to have the key drivers and they influence factors such as coastward migration (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Accept
6-433	A	14	16	14	17	This Table presents a very useful breakdown of the implications of the SRES scenarios on the sector. It should be a model for other chapters, none of which have presented similar analyses. (Lenny Bernstein, IPIECA)	Agree
6-434	A	14	19	14	24	I can't quite grasp this paragraph - not clear how an undeveloped Africa scenario leads to more adverse coastal impacts, and I presume the specific adverse impacts really relate to habitats, rather than the other trends highlighted in the table. Again, the tsunami issue comes back, without a clear statement of how such a crisis affects climate change adaptation. I know they are linked, but make the issues clear - do we want a tsunami-proof coastline? or can we use the threat of tsunamis and similar scale projected climate-change storms and surges to maneouvre decision-makers into allowing space for coastal dynamism?! (Sarah Cornell, University of Bristol)	Agree and modified the text Like concept “or can we use the threat of tsunamis and similar scale projected climate-change storms and surges to maneouvre decision-makers into allowing space for coastal dynamism?!” and will consider in later sections [RN/RW]
6-435	A	14	20	14	22	The example of Africa not developing as a scenario should be further explained,	Deleted

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						and preferably expanded. (Maarten Bavinck, University of Amsterdam)	
6-436	A	14	20	14	20	Add 'or China and India emerging as economic giants' between developing and through. (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	Deleted
6-437	A	14	23			the reference to tsunamis here is not necessary especially since they are espisodic events which it the short term might over whelm the effects of climate change at the local/regional scale; in some exceptions they may provied a window of opportunity to better adapt; find discussing tsunamis just clouds the major issues. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Agree
6-438	A	14	23	14	24	See comment no. 3. Quoting (K. Alverson, 2005, Watching over the world's oceans, Nature 434, p. 19-20. commentary): "Despite local tsunamis being a frequent occurence in the Indian basin, we have no idea when or where to expect the next large regional tsunami. It could be centuries away. " (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Agree
6-439	A	14	23	14	23	sea-level rise, hazards such as tsunamis and hurricanes that would (…) (João Figueira de Sousa, Universidade Nova de Lisboa)	Agree
6-440	A	14	29			I'm not sure what "grid basis" means here. If it means the grid scale of GCMs or smaller then I don't think it is correct that terrestrial scenarios are well developed. There is great uncertainty in simulations of, e.g., precipitation. (Jason Lowe, Met Office)	
6-441	A	14	29		30	No – the Sun is excluded. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Agree
6-442	A	14	30		31	The relation between rotartion and Earth's radius indicates a mean rose of maximum 1.1 mm/ye for 1850–1940 (Mörner, e.g. ICZM Autumn, 31-36). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	WG1 issue
6-443	A	15	6		8	comment : SRES scenarios are usually given from 1990 to 2100 and not to 2080s. That may explain the diffrences in the max values given in the texte. It can be confusing. In 2100 it will be 56 cm for the B1 scenario and 88 cm for the A1FI scenario (LENOTRE NICOLE, BRGM (French geological survey))	WG1 issue
6-444	A	15	7			Please reconcile with the numbers in WG1 TAR which mentions 88cm upper value. Do the numbers quoted include the ice melt parameter uncertainty? Explain why less than 88cm. (Jason Lowe, Met Office)	Reject – following TSU instructions on time frame – make text clearer
6-445	A	15	14	15	14	What are the downscaling tools? Regional modelling studies? Please specify.	Agree

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	
6-446	A	15	14			Possible references? (Loraine McFadden, Middlesex University)	Add or delete comment
6-447	A	15	14			references needed to help direct people to this new and emerging work. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Agree
6-448	A	15	17		20	What about acidification in this table; in addition to poleward migration of species some species could move further offshore; if run-off varies then changes in coastal primary production would be possible. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Agree concerning acidification
6-449	A	15	17	15	20	Table 6.2: It would be easier to understand if the climate driver/direction of change and ecosystem and physical system effects were divided into separate columns. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Agree but difficult in space constraints
6-450	A	15	17			Table 6.2, concerning storm intensity, it has been observed to increase persistently since the 1970s. Please refer to Kerry Emanuel, 2005, Nature, 436, 686-688 (Daidu Fan, Tongji University)	Agree
6-451	A	15	17			Table 6.2 Add: Global temperature increase/sea level rise---coastal erosion, land inundation, wetland loss, barrier beach retreat (Vivien Gornitz, Columbia University and Goddard Institute for Space Studies)	Agree
6-452	A	15	17			Table 6.2 The table is uncomplete: should add for Sea temperature, second column: Increased stratification / for Run-off, second column: Increased nutrification / for atmospheric CO2 concentration, second column: Increased acidity leading to CaCO3 saturation impacts (Yves Henocque, Department of Fisheries)	Agree
6-453	A	15	17		20	Where is – most importnt – the Sun? Where is Earth's rotational changes? (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	WG1 issue
6-454	A	15	17			Table 6.2. Tables/Figs are often positioned quite far apart from the text to which they are referred. This reduces effect. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	
6-455	A	15	17		20	table 6.2 :add shifting of cyclonic zones to "storm track, frequency and intensity" (LENOTRE NICOLE, BRGM (French geological survey))	Accept
6-456	A	15	17			Table 6.2 has now lost the sea level rise section cf ZOD. This seems a shame, as it was good to have the whole list with certainties added. To run-off section might it be worth identifying changes in salinity (associated with ice melting and freshwater influx?) (Heather Viles, University of Oxford)	Agree
6-457	A	15	19	15	20	Got a bandwagon of my own, now - ocean pH decrease, as the corollary of atmospheric CO2 increase - the recent Royal Society report (Carol Turley) and	Accept

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						some research by GLOBEC highlight the potential effects of acidification on fisheries and other ecosystem effects (as well as carbonate equilibrium problems for calcareous organisms) p23 lines 35-38 pick up on acidification, but the RS report has braoder set of impacts. (Sarah Cornell, University of Bristol)	
6-458	A	15	19	15	19	Table 6.2: the response to changing wave climate is not only changing patterns of ersion and deposition but as well a change in the underwater geomorphology and sediment distribution patterns. (Klaus Schwarzer, Institute of Geosciences, Coastal and Continental Shelf Research)	Agree
6-459	A	15	19			Drivers 1 and 2 (sea temperature, runoff) will change the stratification and circulation of the coastal oceans, which will affect HABs, euthrophication, sediment plumes, pollutants, pathogens, etc. (Franklin Schwing, NOAA Fisheries Service)	Agree
6-460	A	15	21	15	23	Sentence too long. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Deleted
6-461	A	15	21	15	21	Abbreviation: West Antarctic Ice Sheet (WAIS). The abbreviation is used below. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Deleted
6-462	A	15	21		24	What is the timescale over which the ice sheets disintegrate? If over centuries or the next millennium, the end result may appear catastrophic relative to the present shoreline, but there would still be enought time to adjust by retreating from the coast. Next sentence is oddly phrased. "….displacement..." As this ice melts, sea level will rise. (Vivien Gornitz, Columbia University and Goddard Institute for Space Studies)	Agree
6-463	A	15	21		28	Unfounded speculations (see general comments). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	WG1 issue
6-464	A	15	21		21	This opening sentence on this paragraph and discussion should mention Greenland as well, then discuss WAIS, then Greenland (next page, a bit hidden). Seems like Hansen 2005 and others have raised issues that make Greenland even more likely to melt down, and that will go quicker than WAIS. You mention this later and discuss quite adequately, but the way this discussion begins here, it looks like it's all about Antarctica, and it isn't. (Susanne Moser, National Center for Atmospheric Research)	Accept
6-465	A	15	21	15	28	This discussion of WAIS should be related to the dicussion on non-linearities to emphasise the importance of that. See comment #5 (Denise Reed, University of New Orleans)	Greatly reduced
6-466	A	15	22			delete "to"	Agree

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						(Donald Boesch, University of Maryland Center for Environmental Science)	
6-467	A	15	22	15	22	Change "to" to "do", i.e., if the ice shelves of the West Antarctica do disintegrate --- (John Hannah, University of Otago)	Agree
6-468	A	15	22	15	22	: if the ice shelves of West Antarctica were to disintegrate… (Bhawan Singh, Université de Montréal)	Agree
6-469	A	15	23			Quite a few pre-1999 references are dotted throughout the text. More recent references should be used and cited. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Agree
6-470	A	15	25		25	that expert "elucidation" I think is an expert "elicitation" (Susanne Moser, National Center for Atmospheric Research)	Agree
6-471	A	15	26			WAIS is not explained (Wilhelm Windhorst, Kiel University)	Agree
6-472	A	15	28			The focus is on WAIS. Some studies, e.g. Ridley et al., 2005 suggest Greenland contribution could be 5 mm/yr early in the simulation for a forcing less than 21st century forcing of A1FI. (Jason Lowe, Met Office)	Agree
6-473	A	15	28			What about the larson C collapse in 2003? (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Agree
6-474	A	15	31			Not at all. It may, in fact, even fall. My estimate is +5 +/-15cm. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Agree
6-475	A	15	32			if "unrealistic" – drop it. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Agree
6-476	A	16	5	16	8	This point has already been made re WAIS on previous page - make the link or delete the duplication. (Denise Reed, University of New Orleans)	Agree
6-477	A	16	8			"irreversibly" not "irreversible" (Donald Boesch, University of Maryland Center for Environmental Science)	Agree
6-478	A	16	8	16	8	split infinitive, and 'irreversibly' (Sarah Cornell, University of Bristol)	Agree
6-479	A	16	9	16	17	Delete these results. They are based on a CO2 rise of 2% per year, which is completely unrealistic. Currently CO2 levels are rising at 0.5% per year. The fastest rate of rise in any of the SRES illustrative scenarios (A1FI) is less than 1% per year, and does not reach four times pre-industrial level by 2100. The other illustrative scenarios have substantially lower rates of increase. (Lenny Bernstein, IPIECA)	Deleted but disagree as 4xCO2 forcing levels out at a lower forcing than 21st century increase in A1FI (discuss with Jason Lowe, Hadley Centre)
6-480	A	16	9	16	13	Sentence too long. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Agree

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6-481	A	16	9	16	13	Improved punctuation would help this sentence. Also change the word, "experiences" to, "showed". (John Hannah, University of Otago)	Agree
6-482	A	16	9	16	13	Very clumsy sentence. Reword. (Victor Kennedy, University of Maryland Center for Environmental Science)	Agree
6-483	A	16	9	16	13	Need to rephrase this sentence (Bhawan Singh, Université de Montréal)	Accept
6-484	A	16	10	16	11	The assumption of a 2% per yr increase in CO2 concentrations over the next 70 years seems somewhat unrealistic considering the Mauna Loa CO2 record shows an average increase of about 0.4% per yaer increase from 1959 to 2004, with a max year-to-year incraes of about 0.75% {see Keeling and Whorf 2005, at CDIAC]. (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Accept
6-485	A	16	14	16	14	"Over the next millenia". Vague. Does the author mean "millenium"? (Kevin Walsh, University of Melbourne)	Accept
6-486	A	16	15			Rise in sea-level or increased rate of rise? It might be helpful to more clearly distinguish between the two. (Denise Reed, University of New Orleans)	Accept
6-487	A	16	18	19	18	…timescales remain to be… (Bhawan Singh, Université de Montréal)	Accept
6-488	A	16	19	16	19	...but is required….. Also this sentence needs to be rewritten. (Bhawan Singh, Université de Montréal)	Accept
6-489	A	16	21			Paragraph is repetitive with earlier SRES material. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Accept
6-490	A	16	28	18	49	For Box 6.2: I suggest to retain the example about Australia. Two following examples less correspond to the section 6.3.2 theme "Climate and sea-level scenarios". (Stanislav Ogorodov, Lomonosov Moscow State University)	Accept
6-491	A	16	28	18	49	Box 6.2 should be shortened (Miltiadis Seferlis, Greek Biotope/Wetland Centre)	Accept
6-492	A	16	28	18	50	Reduce to 1 page, reduce 1 to 2 Figs. (Qilun Yan, National Marine Environmental Monitoring Center)	Accept
6-493	A	16	29			Box 6.2 Add: Case study: In the greater New York City metropolitan area, sea level is projected to rise by 24 cm to 1.1 m by the 2080s, based on extrapolation of historic tide gauge data and two global climate models (Hadley Centre and Canadian Climate Centre) (Gornitz et al., 2002). As a consequence, the flood return period for the 100-year storm (combined extratropical and tropical cyclones) will be reduced to 4-60 years. (Ref: Gornitz, V., Couch, S., and Hartig, E.K., 2002.	Reference added

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						Impacts of sea level rise in the New York City metropolitan area. Global and Planetary Change, 32, 61-88). (Vivien Gornitz, Columbia University and Goddard Institute for Space Studies)	
6-494	A	16	29			Box 6.2 - Lots of others besides Nicholls could be cited. Woolf, Woodworth, Flather, Wolf to name a few other UK scientists. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Accept
6-495	A	16	32		45	Increase in extreme events is not based on observational facts but on models (this was even noted in TAR-3). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Controversial issue – WG1
6-496	A	16	39			changes in the storm surge -> add : wave (LENOTRE NICOLE, BRGM (French geological survey))	Disagree Models are surges – not waves
6-497	A	16	48	16	50	Run-on sentence (Victor Kennedy, University of Maryland Center for Environmental Science)	Accept
6-498	A	16	48	16	50	...dynamical modelling to investigate… (Bhawan Singh, Université de Montréal)	Accept
6-499	A	17	3			"storm component" ? Storm surge component (Unnikrishnan Alakkat, National Institute of Oceanography)	Accept
6-500	A	17	5	17	5	Ice Age abrupt events were larger and more widespread than those of the Holocene: I think it would be agreed that they were of geater amplitude in the Full and Late glacial than in the Holocene, but I think the jury is still out about the widespread nature of Holocene changes. That is, there is increasing evidence of quite extensive rapid transitions at the millennial-scale during the Holocene (where rapid is based on the definitions in the top of the paragraph). For example Viau et al (2002, Geology 455-458), have suggested that these rapid millennial-scale changes occurred synchronously in pollen diagrams across North America, and we have a paper accepted that shows these transitions occurred in Europe (pollen diagrams) at the same times as in North America. I think it would be more fair to say we dont know much about this yet. (Konrad Gajewski, University of Ottawa)	Not applicable – seems to be referring to another chapter – WGI? Take up with TSU.
6-501	A	17	6		17	McInnes et al. 2003 was not in the references, but then the entire page 67 seems to be missing from my copy. (Gregg Brunskill, Australian Institute of Marine Science)	Check
6-502	A	17	6			Box 6.2 Table 1 could be spaced/formatted more efficiently and effectively in terms of space and visuals. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Accept
6-503	A	17	26			Sizeable' is too vague to help this discussion. (Denise Reed, University of New Orleans)	Accept

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6-504	A	17	27	17	27	...regions are experiencing.. (Bhawan Singh, Université de Montréal)	Accept
6-505	A	17	30		30	"has POTENTIAL implications for flood defence in London" - I don't think that if any of the SRES play out, or even if we just continued on the historical rates of SLR, that we need to be THIS careful. Just drop the potential, and maybe even say what these implications might be. Just spell it out. This is so academically hidden, no wonder no one pays attention to what we have to say!!! Just say it! Spell it out! (Susanne Moser, National Center for Atmospheric Research)	Accept
6-506	A	17	33		34	Yes, very much so – and still this draw-back is ignored in the text. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	?
6-507	A	17	33			The uncertaintiy described on line 33 seems to negate the statements on lines 27-28 where the it appears we know what is happening in most regions. (Denise Reed, University of New Orleans)	Accept
6-508	A	17	34	17	35	It is hard to know what a treeline shift was in the non-analogue forests of the late-glacial. Was the southward shift of the treeline, difficult to identify at that time, really that noticable? Why not just say rapid vegetation responses. (Konrad Gajewski, University of Ottawa)	Wrong chapter?
6-509	A	17	37			'especially Bangladesh " may be changed as "especially Bangladesh and east coast of India" (Unnikrishnan Alakkat, National Institute of Oceanography)	Accept
6-510	A	17	38			regarding Love and Gregory (2005)-- "storm surge model for the Bay of Bengal" may be changed to "storm surge model for the northern part of the Bay of Bengal " (Unnikrishnan Alakkat, National Institute of Oceanography)	Accept
6-511	A	17	41			Time (2) forgets the effect of the Solar Minimum at this time (Mörner, 2005a). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	WG1 issue
6-512	A	17	47			Box 6.2 Analysis of extreme water levels for impact and adaptation analysis: changes in sea level can also change the ocean dynamics themselves. Lionello P., Mufato R., Tomasin A. (2005) Sensitivity of free and forced oscillations of the Adriatic Sea to sea level rise. Climate Research 29: 23-39 (Jane da Mosto, CORILA)	Text deleted
6-513	A	17				In Box 2 Table 1 the time scales for the predictions needs to be provided. (Denise Reed, University of New Orleans)	Accept
6-514	A	18	1		50	Box 6.2 figures need to be improved, showing location in each country, larger size, better explanations, and sources of the information. The consequences of increased freshwater flooding and sea water rise should be discussed for each situation, as to where will industry in human population move after 5-10 major destructive river or seawater floods happen.	Beyond the scope of the Box

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						(Gregg Brunskill, Australian Institute of Marine Science)	
6-515	A	18	11	18	13	Figure 1: Please indicate latitude and longitude in the maps. A reference map of Australia would be of great help. The figure could be placed directly above or under table 1 (summary of Australian extreme water level anayses). References for the figure? (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Accept
6-516	A	18	12	18	12	…and 2050 climate… (Bhawan Singh, Université de Montréal)	Accept
6-517	A	18	27	18	31	Figure 2: A reference map of Europe would help. The graphic resolution is not good. The legend is very difficult to read. The figure could be placed directly under the corresponding text. References for the figure? (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Accept
6-518	A	18	48	18	49	Figure 3: A reference map of N Indian Ocean would help. The graphic resolution is not good. The figure could be placed directly under the corresponding text. References for the figure? (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Accept
6-519	A	19	0	37		This section is too long. Furthermore is follows the classical approach of climate change impacts on natural systems and then consequences for human societies. Sections 6.2 and 6.3 showed clearly that coastal changes cannot be dealt with in isolation from human impacts. In fact it showed that most low-lying areas heave been heavily modified by humans for centuries. Hence a subsection of climate change impact on (heavily) modified coasts and low-lying areas is in order. (Wim Salomons, Institute for Environmental Studies. Free University Amsterdam)	Accept – section will be shortened slightly and 6.4.2 will address the impacts on developed coastal areas (Virginia)
6-520	A	19	2	19	5	what do these lines tell us (Richard Beamish, Pacific Biological Station)	Accepted, deleted these lines (Virginia)
6-521	A	19	2			this simply repeats a point made on page 13, lines 32-34. Only needed once. (Thomas SPENCER, Cambridge University)	Accepted, delete these lines (Virginia)
6-522	A	19	4		4	Fact check whether that cited paper was about stabilizing emissions or about stabilizing concentrations (which would, of course, require a substantial reduction of emissions. Stabilizing emissions (at current rates) I don't think will give us the desired relief here! (Susanne Moser, National Center for Atmospheric Research)	Accepted, delete these lines (Virginia)
6-523	A	19	8	23		Nearly all of this section is about sea level rise, with only two short paragraphs (p. 23, line 13-38) on hydrology and chemical effects. This is not well balanced presentation or analysis. (Gregg Brunskill, Australian Institute of Marine Science)	We need to add temperature and salinity effects where applicable in these pages (Virginia)
6-524	A	19	8	36		Comment on section 6.4 -- flooding issues: Throughout the text, coastal floods are	Accepted, (we need to add this point in text)

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						nearly always characterized (explicitly or implicitly) as storm-surge or sea floods. I do not see any explicit recognition of the role of higher sea level in greatly exacerbating freshwater floods of inland origin. I am not sure where to find this information in the literature, but 20 years ago Maury Roos of the California Department of Water Resources calculated that a one-foot rise in sea level would transform the 100-year flood in the Sacramento-San Joaquin Delta into a 10-year flood. Add to this effect the influence of earlier and faster snowmelt, increased frequency of high intensity rainfall events, and an accelerated hydrologic cycle, and it becomes apparent that SLR greatly worsens threats fromthe landward as well as the seaward side. (Robert Buddemeier, University of Kansas)	(Virginia)
6-525	A	19	8	38	5	Not much infromation about Mediterranean Sea, in many aspects a sensitive and important marine ecosystem. (Miltiadis Seferlis, Greek Biotope/Wetland Centre)	Accept
6-526	A	19	8	38	5	Consider strengthening regarding the evaluation of impacts in the first 21st century. (Miltiadis Seferlis, Greek Biotope/Wetland Centre)	Accept
6-527	A	19	8	38	5	Can you reduce length of coverage of the topic? (Miltiadis Seferlis, Greek Biotope/Wetland Centre)	Accept (see 519)
6-528	A	19	8	36	3	Reduce to within 8 pages (Qilun Yan, National Marine Environmental Monitoring Center)	See 519
6-529	A	19	10			This section also poorly represents coastal systems. There needs to be a brief introduction about coastal environments, habitats, their geographic distribution and spatial extent - and which ones this chapter focusses on. Rocky coasts represent 80% of the world's coastline and there is only scant mention of them. Although there erosion may be less than that of soft cliffs, there contribution to the sediment budget for maintaining other habitats/coastal areas such as beaches is often under recognised and the rock coasts themselves protect much coastline. References need to be made to Trenhaile, Stephenson and the recent EU Eurosion project. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Comment about rocky coasts accepted, (add Normandy and other examples as appropriate from EU reports) Introduction to coastal environments is in section 6.2
6-530	A	19	10			Not enough coverage of current known and future ecological impacts on coasts in terms of community ecology, species and how this may lead onto effects on other parameters such as how we manage and monitor for legislation, the effects it will have on fisheries, etc. Examples can be drawn from changes in coastal bird behaviour, for which there are references such as the IBIS special issue in 2004. This section is currently very physical process-based. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	
6-531	A	19	14	19	16	It is not right that accretion only occurs if there is locally abundant sediment	Accepted, delete lines 15 and 16 (Virginia)

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						supplied by rivers or in uplift areas. There are a lot of areas under accreation or growing just by redeposition of sediment. As an example: the erosion of a cliff of 30 m height which is composed of sandy sediments (occurs very often around the Baltic sea but as well in other areas around the world) supplies a huge amount of sediment for the creation of new spits and lowlands only a few meters above sealevel. Not only rivers should be regarded as sediment suppliers. (Klaus Schwarzer, Institute of Geosciences, Coastal and Continental Shelf Research)	
6-532	A	19	17			An assumption is here converted to a "fact". (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Ignore – examining what if
6-533	A	19	19	33	41	Estuaries and coastal lagoons have always been infilling environments in periods of sea level rise. In my personal opinion I do not think that the conceptual link between coastal lagoon trapping of sand sized sediment and the sediment budget on open adjacent coast lines warrants a prediction of erosion several magnitudes greater than what is predicted by Bruuns model. These suggestions do not conform with coastal evolution in the Danish part of the Wadden Sea. where prograding and eroding barrier coastlines are found within a distance of 20 Km. (Morten Pejrup, Institute of Geography University of Copenhagen)	Reword to reflect controversy, but not fully accepted (Virginia)
6-534	A	19	21	19	31	This point focuses on the line 29 -- is 'adding together' and 'integrating' the same thing? I believe that the Gornitz et al. assessment combines very different parameters e.g. wave heights in metres, slope in degree to give a vulnerability index value. This is a simple and useful approach, however is such an approach sensitive enough to the dynamics of integrated system behaviour to be termed an integrated assessment? (Loraine McFadden, Middlesex University)	The examples cited here use a similar approach for categorizing and mapping vulnerability based on an integration of various physical components of coastal systems. They do not simply “add together” variables. We do not call these “integrated assessments” which implies an assessment of social factors, etc (Virginia)
6-535	A	19	21	19	31	It is necessary to add the scheme of cross-section of the coast change (Bruun, 1962). This scheme is essential for understanding shoreline evolution mechanism provided by predicted sea level rise. (Stanislav Ogorodov, Lomonosov Moscow State University)	Not accepted
6-536	A	19	33		36	Shouldn't offshore geomorphology and changes in freshwater discharge volumes be included in factors affecting beach sediment supply? (Jacqueline Alder, Fisheries Centre, University of British Columbia)	See 533 (Virginia)
6-537	A	19	33	19	41	see above comment (Marcel Stive, Delft University of Technology, Faculty of Civil Engineering & Geosciences)	Accept
6-538	A	19	40		41	It might be a good idea to reinforce the need to practice good coastal management	

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						to enable coasts and communities to better adapt to climate change. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	
6-539	A	19	41			Ahrendt 2001 is missing from the reference list (Susanne Moser, National Center for Atmospheric Research)	Add to references: (Virginia) Ahrendt, 2001. Expected effect of climate change on Sylt island: results from a multidisciplinary German project. Climate Research, 18, 141-146.
6-540	A	19	43	20	2	Given that so many examples are mentioned in passing it is not clear why this one is amplified. The information is helpful - this is the kind of deatil which is needed to support some other concepts (see many other of my comments). (Denise Reed, University of New Orleans)	The organization of this section was to be: sandy beach-dunes, gravel and cobble beaches, soft rock and hard rock cliffs. IN rewriting we will attempt to make this flow better (Virginia)
6-541	A	19	43	20	2	It does not make sense to list growing rates of spits if at the same time nothing is mentioned about the water depth in the growing direction of the spit. It is a big difference if just a 5 m deep area is filled up by the migartion or a 100 m deep area is filled up. Even tons are not an appropriate scale. A proper dimnsion is m^3 / time unit (year). (Klaus Schwarzer, Institute of Geosciences, Coastal and Continental Shelf Research)	Accepted, delete example beginning on line 45 (Virginia)
6-542	A	19	45	19	50	delete lines (Derek Jackson, University of Ulster)	Accepted, delete example beginning on line 45 (Virginia)
6-543	A	19		21		too many beach and cliff examples. I suggest this is where the text can be shortened. (Richard Beamish, Pacific Biological Station)	Accepted, delete example beginning on line 45 (Virginia)
6-544	A	20	1	20	3	delete lines (Derek Jackson, University of Ulster)	Accepted, delete example beginning on line 45 (Virginia)
6-545	A	20	4	20	4	The role of gound water levels on cliff retreat is discussed for soft rock cliffs which are of course more sensistive to changes in ground water levels than hard rock cliffs. A fine example of the prominent role of ground water in the retrear mechanisms of cliffs cut in soft bedrock (chalk) is provided by Pierre, G. and Lahousse, P. (in press): The role of groundwater in cliff instability: an example at Cape Blanc-Nez (Pas-de-Calais, France), Earth Surface Proceses and Landforms. There are other examples of this, but this is a nice example in which variations in precipitations, runoff and infiltatration were analysed showing that these mechanisms play a more important role than marine processes for the retreat of these cliffs.	Accepted (Virginia)

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Arnaud Hequette, Université du Littoral)	
6-546	A	20	4	20	10	As said on this page (lines 7 and 8), higher gound water levels may enhance soft cliff erosion, this being favored by increased precipitation. There are large uncertainties, however, concerning precipitations in the future (at local, regional or even larger scale), and it should be emphasized that there is an important need for better estimations of precipitations with climate change if we want to obtain more reliable predictions of future soft rock cliff retreat. (Arnaud Hequette, Université du Littoral)	Accepted, the importance of precipitation is stated in line 9. We will rephrase to make it clear that "changes in precipitation and ground water levels" could influence soft rock cliff retreat. (Virginia)
6-547	A	20	4	20	17	Although modelling of soft rock cliffs considerably improved during recent years I think it should be acknowledged that models such as those decribed in this page (which are based on the dynamic equilibrium of shore profile to changes in sea-level, wave heights, and tidal range) represent morphological adjustments to changes in hydrographic and oceanographic forcings without considering variations in factors such as ground water levels, runoff and other processes that may also control the erosion of soft rock cliffs. The role of ground water level and precipitations may be quite significant in the dynamics of soft rock cliffs (as stated in lines 7 and 8). (Arnaud Hequette, Université du Littoral)	See response to comment 6-546. (Virginia)
6-548	A	20	4			Is the issue with hard rock cliffs really this simple - what about shore cut platform communities that become submerged? (Denise Reed, University of New Orleans)	Yes in a generic, relative sense, see Cooper and Jay (2002) (Virginia)
6-549	A	20	4	20	10	The retreat of soft rock cliffs along the coast of Patagonia is not representative. There have been a lot of reserach done on this subject in the northern hemisphere (American continent by Davidson Arnott and around the Baltic Sea, where records are existing for more than 100 years (Kannenberg, Schrottke et al.). (Klaus Schwarzer, Institute of Geosciences, Coastal and Continental Shelf Research)	Accepted, add a sentence reflecting on the complexities of cliff retreat noted in Cooper and Jay (2002) . (Virginia)
6-550	A	20	5			Lack of critical analysis of Cooper and Jay and other literature on this topic. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Accepted, see response to 6-500. (Virginia)
6-551	A	20	5		8	comment : the more rapid erosion of soft rock cliff will not be only due to toe erosion as written. The collapse of the top of cliff will also increase because of increase of rainfall wich will increase infiltration phenomenum and of increase of frost/thaw phenomenum in medium-high latitudes (LENOTRE NICOLE, BRGM (French geological survey))	Accepted, see response to 6-546
6-552	A	20	8	20	10	What is the cause of this acceleration in erosion: sea-level rise, increased storminess, increased precipitation? It would be useful to know what has changed. (Arnaud Hequette, Université du Littoral)	Jorge??

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6-553	A	20	9	20	9	m per year, not m year (Sarah Cornell, University of Bristol)	Accepted. (Virginia)
6-554	A	20	9		10	"rate has accelerated during past decade": is it possible to give values? (LENOTRE NICOLE, BRGM (French geological survey))	Jorge ?
6-555	A	20	12	20	17	Have such models only been applied to (the east coast of) England? The paragraph commences with the words 'considerable progress'. (Loraine McFadden, Middlesex University)	Robert, can you or Jim Hall answer this ? (Virginia)
6-556	A	20	12	20	17	It would eb helpful to know whether the SCAPE model is 2D or 3D - does it suffer from some of the same problems as the Bruun rule for instance? (Denise Reed, University of New Orleans)	Robert, can you or Jim Hall answer this ? (Virginia)
6-557	A	20	20	4	10	This shift in erosion can hardly be interpreted as a consequence of sea level rise. Other factors will surely have changed much more during these 5 decades. (Morten Pejrup, Institute of Geography University of Copenhagen)	Accepted. (Virginia)
6-558	A	20	20	20	38	Figure 6.2 is useful, but relating parts a and b is difficult because the x axis is different (reversed direction and different units) to the gtrapsh in section a. If the four graphs could be more standardised the impact would be better (Heather Viles, University of Oxford)	Accepted, the graphs are from the 2005 publication. (discuss with chapter team) (Virginia)
6-559	A	20	38	20	38	Figure 6.2 b is confusing because the x-axis has been shifted so that one gets the impression that the high scenario causes the smallest recession of the coast. (Morten Pejrup, Institute of Geography University of Copenhagen)	Accepted, the graphs are from the 2005 publication. (discuss with chapter team) (Virginia)
6-560	A	20	41			Figuer 6.2 Need N-S markers on this figure as text refers to this and assumes global readers will know that Happisburgh is south of Cromer! See line 36 on the same page. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Accepted, (ask can you or Jim Hall to add N-S indication on his figure) (Virginia)
6-561	A	20	42	20	42	…in figure assumes… (Bhawan Singh, Université de Montréal)	Accepted, change “on” to “in” (Virginia)
6-562	A	21	8			There is no context for the reference to sub cell 3b. (Denise Reed, University of New Orleans)	Not sure what additional context is needed? (Virginia)
6-563	A	21	8			sub cell 3b' has no significance for an international audience (Thomas SPENCER, Cambridge University)	Accepted, ask Jim Hall if he can insert reference map (Virginia)
6-564	A	21	15			Box 6.3. Second paragraph is repetitive with earlier text. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Accepted, discuss deleting box 6.3 with chapter team (Virginia)
6-565	A	21	21	21	22	Terrestrial carbon inventory stable? Gajewski et al (2001. Global Biogeogeochemical Cycles 15: 297) show a large change in carbon storage in peatlands duting the postglacial, estimated at <25Pg at 15k to >450Pg at the present. Recent work in Siberia is also showing large changes in peatland extent and initiation.	This comment appears to be misplaced and Ignore. Comment does not relate to paragraph. (Virginia)

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						(Konrad Gajewski, University of Ottawa)	
6-566	A	21	27			what does 'good agreement' mean? Who says the agreement is good? (Thomas SPENCER, Cambridge University)	Accepted, reword. (Virginia)
6-567	A	21	29		39	Nothing of this scenario modeling matters. It is only the quality of observations that matters. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	We disagree, historical observations alone are not sufficient to determine future coastal conditions. (Virginia)
6-568	A	21	29	21	29	Forty two instead of 42 (Bhawan Singh, Université de Montréal)	Accepted. (Virginia)
6-569	A	21	32			The numbering sequence of figures should be carefully reviewed and clarified. Figure 6.3.1 is cited on page 21 but presented on page 31, after several 6.4 boxes/tables/figures. Suggest you move the figure closer to page 21 to avoid confusion. Also, Figure 6.3 cited on page 27 is apparently missing, and should it be cited as Figure 6.3.2? (Donald Cahoon, Patuxent Wildlife Research Center, Beltsville Lab)	Accepted, numbering and figure placement will be corrected. (Virginia)
6-570	A	21	32			Figure 6.3.1 is missing (Arnaud Hequette, Université du Littoral)	Accepted, figure placement will be corrected (Virginia)
6-571	A	21	32			Figure 6.3.1 does not appear for another 10 pages (Victor Kennedy, University of Maryland Center for Environmental Science)	Accepted, numbering and figure placement will be corrected. (Virginia)
6-572	A	21	32			Figure 6.3.1 is referred to but this numbering does not exist. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Accepted, numbering and figure placement will be corrected. (Virginia)
6-573	A	21	32			Figure 6.3.1 should be included in box 6.3 (Wilhelm Windhorst, Kiel University)	Accepted, these will be merged if both are kept. (Virginia)
6-574	A	21	43	23	50	I think that the paragraph 6.4.1.2 is weak on the sedimentological and hydrographical part and focuses too much on the biological implications of sea level rise. There is a very close connection between biota and sediment accumulation in shallow estuaries that is not mentioned at all (Morten Pejrup, Institute of Geography University of Copenhagen)	Will consider rewording (Virginia)
6-575	A	21	45			change "hydrodynamic-oceanographic" to "hydrodynamic" (Unnikrishnan Alakkat, National Institute of Oceanography)	Accepted (Virginia)
6-576	A	21	46			Deltas and coastal embayments are quite different environments. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Accepted, indicate that estuaries and lagoons are commonly associated with (but not restricted to) depositional coastal landforms (Virginia)
6-577	A	21	47	21	50	"peak warmth is locally delayed". What does that mean? Delayed with respect to what? Quite frankly, I don't understand what this sentence is saying, quite apart from the fact it seems quite speculative. Oh, Macdonald et al (typo) (Konrad Gajewski, University of Ottawa)	Ignore. Comment does not match with any part of this text. (Virginia)

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6-578	A	21	50	21	50	According to the definition marshes are supratidal; not intertidal. If it is the pioneer zone that the authors refer to it is a very narrow zone in the Gulf of Mexico where tidal range is only about 30 cm. I would suggest to write "1700 km2 of coastal salt marshes were ....." (Morten Pejrup, Institute of Geography University of Copenhagen)	Accepted. Revise as suggested. (Virginia)
6-579	A	21	50	22	1	are you saying that the loss of 1700 sq km of marsh is entirely due to 'human development'? There are more recent, 2005 publications on Mississippi land loss. Somewhere in this chapter there is a need to consider the landscape modelling work on the Mississippi and its predictions of future land loss (Thomas SPENCER, Cambridge University)	Accepted, insert “primarily” before the words “due to” (Virginia)
6-580	A	21	51	21	53	Typo, temperate forest. And et al., has been dropped. The sentence also implies the pollen-based reconstruction shows glacier expansion (Konrad Gajewski, University of Ottawa)	Ignore. Comment does not match with any part of this text. (Virginia)
6-581	A	22	0			Suggest inclusion of reference to interactions between snow depletion in the Himilayans, more intense monsoon winds and greater circulation in the Arabian Sea, that could result in fish kills and nitrogen gas releases. See http://www.bigelow.org/climatechange/ for further information, as well as related Science article: Goes et al., Warming of the Eurasian Landmass Is Making the Arabian Sea More Productive, Science 2005 308: 545-547 (Magdalena Ariadne Kim Muir, Arctic Institute of North America (AINA), and EUCC-Coastal Union)	Ignore. Comment does not match with text. (Virginia)
6-582	A	22	1			The Barras et al is a projection of land loss not a model simulation. (Denise Reed, University of New Orleans)	Accepted, change sentence to reflect this is projection (Virginia)
6-583	A	22	7		18	Some mention of the impact of Hurrican Katrina might make the point here. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Section will be added on tropical cyclones. (Virginia)
6-584	A	22	7	22	31	There is discussion of New Orleans and the Missippi delta in terms of the interactions between human development and sea level rise. There also needs to be a recognition of additional climatically induced vulnerability of these areas to extreme weather events and sea surface temperature rise. There has been a lot of analysis now of the increased intensity of hurricames due to warmer sea surface temperatures in the Gulf of Mexico, which suggests pattern of existing and future climatic impacts is already manifesting itself now, and that could be referred to a future impact. (Magdalena Ariadne Kim Muir, Arctic Institute of North America (AINA), and EUCC-Coastal Union)	Accepted. Section or box about tropical cyclones should be added. (Virginia)
6-585	A	22	7		18	Proposed added sentence : Salted intrusion in coastal aquifers will have consequencies on water supply and agriculture	Agrees in concept but impacts on human are covered in section 6.4.2. (Virginia)

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						(LENOTRE NICOLE, BRGM (French geological survey))	
6-586	A	22	9	22	10	It would facilitate to have the country for each delta (Thailand, USA, China). (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Accepted, insert country name after each delta (Virginia)
6-587	A	22	10		13	Maybe a reference to recent impacts of hurricaine Katrina is worthwile (Luciana das Neves, Hydraulics and Water Resources Institute | Faculty of Engineer, University of Porto)	Accepted. Section or box about tropical cyclones should be added. (Virginia)
6-588	A	22	11			it is not just groundwater withdrawal in the Mississippi but also oil and gas removal (Thomas SPENCER, Cambridge University)	Disagree, oil and gas withdrawals are affecting the wetlands near the city but not the city of New Orleans (Virginia)
6-589	A	22	12			Groundwater withdrawals have not reduced land elevations in New Orleans--there are essentially no groundwater withdrawals there. Rather, drainage of swamps has caused compaction due to loss of soil volume. (Donald Boesch, University of Maryland Center for Environmental Science)	Disagree. There were historical withdrawals that contributed to subsidence. See the following article: Kazmann, R.G. and Heath, M.M. 1968. Land subsidence related to ground water offtake in the New Orleans area. Trans. Gulf Coast Assoc. of Geol. Soc, vol. XVIII.
6-590	A	22	13	22	13	Please cite the cities in the same order as the corresponding deltas above. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Accepted, cites will be cited as suggested (Virginia)
6-591	A	22	14	22	18	Sentence too long. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Editorial.
6-592	A	22	20		31	Salt water intrusion in these areas might be worth a mention here. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Will consider adding (Virginia)
6-593	A	22	20			Sea level rise will not destroy the world's deltas, but will move them upstream and perhaps change their shape. In some locations where runoff increases, deltaic accumulation and extension rates will likely increase. (Gregg Brunskill, Australian Institute of Marine Science)	Disagree, most of the world's deltas were formed during the past 8,000 years when sea level rise decelerated. Note that we say an acceleration in sea level rise will contribute to the gradual destruction of many (not all) of the world's deltas. (Virginia)
6-594	A	22	20	22	31	Problems with the text. Coleman et al. 200_ does not appear in the list of references (Morten Pejrup, Institute of Geography University of Copenhagen)	Virginia will check with Jim Coleman on this.
6-595	A	22	20	22	39	Formating problem with these 2 paragraphs. Cannot print/read end of lines. (Bhawan Singh, Université de Montréal)	Formatting problem does not appear in authors or IPCC files.
6-596	A	22	26	22	26	Complete reference (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Virginia will check with Jim Coleman on this.
6-597	A	22	28		31	This is also happenning throughout the European coasts, again some examples can be taken from the EUrosion Study	Accepted, insert " and parts of Europe" after "Asia" (Virginia)

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						(Luciana das Neves, Hydraulics and Water Resources Institute | Faculty of Engineer, University of Porto)	
6-598	A	22	28	22	31	also reforestration in the upper river basin contributes to sharp reduction of sediment flux (Daidu Fan, Tongji University)	Not necessary to say this here (Virginia)
6-599	A	22	30	22	30	Water removal? (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Accepted, substitute “removal” for “abstraction” (Virginia)
6-600	A	22	33	22	39	please pay attention to new discussion of "Bruun rule" by (Li et al., 2000, Chinese Journal of Marine Geology and Quaternary Geology,20(1): 87-91; Cooper and Pilkey, 2004, Global and Planetary Change, 43: 157-171; Pilkey and Cooper, 2004, Science, 303: 1981-1982). Assessing coastal erosion based on the Bruun rule can be misleading (Daidu Fan, Tongji University)	Agreed, the Bruun rule is discussed as a first order, two dimensional approach for estimating shoreline erosion on page 19, lines 21-27.
6-601	A	22	33	22	39	I think that this paragraph shows that it is not sea level rise that control the coastal retreat in this area. One has to remember that sediment availability is much more important for coastal development on a decadal time scale than sea level rise. Normally changes in sediment supply are caused my human activities in the form of coastal protection or dredging of navigation channels (Morten Pejrup, Institute of Geography University of Copenhagen)	But there is a sea level signal
6-602	A	22	34	22	35	Should be changes in the Blackwater described by Pethick be described as an adjustment to a changed tidal prism (due to sea-level rise) - rather than simply erosion. I think more substance can be added here without too many more words. (Denise Reed, University of New Orleans)	Accepted, will add to text (Virginia)
6-603	A	22	36			6 mm/yr (Vivien Gornitz, Columbia University and Goddard Institute for Space Studies)	Accepted, insert “per year”. (Virginia)
6-604	A	22	42			Need to justify earlier on, why the coastal types discussed in this chapter were focussed on - at present it reads as these are the only coastal systems which exist. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Agreed, we may need to reorganize this section because nearshore continental shelf waters, barrier features and coastal plains are left out (Virginia)
6-605	A	22	45	22	49	Sentence too long and not clear. If the influence of sea-level fluctuations is not clear, then what is aimed with the statement? (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Storms certainly play a role here but they are not as certain about sea level change (Virginia)
6-606	A	22	49	23	2	The sentence is not informative. There are no former comments on the Volga river delta in the text. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	
6-607	A	22	50	22	50	Bohai, check spelling. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Spelling is correct (Virginia)

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6-608	A	23	1			A lake, not a sea. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	The Chinese refer to this as Bohai Sea. (Virginia)
6-609	A	23	4	23	22	There is a summary of the impacts of changing sea level rise and fresh water flow on coastal systems. While there is brief mention of temperature changes and CO2 enrichment, there is no reference to extreme weather events such as impacts of storms, which can also have a major and even catostrophic impacts on particular coasts. Under freshwater inputs, there is also no explicit discussion of the changes in seasonal and annual rainfall, which is a very big issue for some coasts such as the Mediterranean and southern Europe (i.e., wide spread change in winter rains and droughts for last 2 or 3 years in Portugal and Spain). Lastly, the comments with respect to the persistence of animal and plant life, or biodiversity, does not recognize the coastal development and coastal squeeze are likely to barriers to this type of "adaptation" in many of the coasts of the world. Please also see more general comments on interactions between climate change and biodiversity. (Magdalena Ariadne Kim Muir, Arctic Institute of North America (AINA), and EUCC-Coastal Union)	Accepted, paragraph on temperature effects should be added (Virginia)
6-610	A	23	4	23	5	I think that this statement is too general. Shallow estuarine systems where sediment accretion can keep pace with sea level rise will not experience increased salinities. But the statement may be true for deeper estuaries like Ria and fjords (Morten Pejrup, Institute of Geography University of Copenhagen)	We use the word “generally” for this very reason, based on dozens of scientific articles we reviewed. (Virginia)
6-611	A	23	5			it would be helpful to have some examples of vegetation community shifts as a result of salinity change. There is published data on shifts from Spartina alterniflora to Spartine patens in the Mississippi delta plain with salinity change (Thomas SPENCER, Cambridge University)	Will add example(s) as suggested (Virginia)
6-612	A	23	6	23	6	Add 'or changes in vegetation composition, as observed in the Sunderban (Ifthekar & Islam, 2004)' after further inland. (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	The change in the salinity of the Sunderbans has been attributed to tectonic movements that caused changes in the Ganges river course, more so than climate and sea level rise (Virginia)
6-613	A	23	11	23	11	Atmospheric CO2 enrichment? (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	No, an increase in dissolved or aqueous CO2, which is associated with atmospheric CO2 enrichment (Virginia)
6-614	A	23	13		22	Although there may be greater flushing in some estuaries and therefore less eutrophication and fewer algal problems. Won't inshore waters see changes in the levels of harmful algal blooms (HABs) especially with nutrient increase as seen in the hypoxic zone of the Gulf of Mexico (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Yes, freshwater systems will be affected by these processes but this should be in another chapter. (Perhaps we could refer to the ecosystems or other chapter here) (Virginia)

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6-615	A	23	13		22	The discussion of changes in river flow rates on estuarine flushing is good, but the parallel situation on the shelf margin is not presented, as an equivalent factor in flushing and residence time of shelf and continental sea water masses. If greenhouse warming of the surface ocean inhibits upward mixing of cold deep water, then upwelling along some coasts will decrease, and this source of nutrients (and cooler water) will decline for coastal productivity and fisheries. (Gregg Brunskill, Australian Institute of Marine Science)	Good point, will consider adding (Virginia)
6-616	A	23	13	23	22	The paragraph is not clear. Freshwater input alone is not the only factor responsible for estuarine stratification. It also depends much on estuarine circulation. Additionally, inputs of freshwater with high nutrient concentration may also estimulate eutrophication. Estuaries with shorter water residence time have less probabilities of developing algal blooms because the nutrient yield is diluted due to rapid water exchange. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Agreed, we will clarify to indicate "influence" rather than "determine" (Virginia)
6-617	A	23	13			More recent references are required for this and the next paragraph. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	The references are dated 1997, 2001, 2002, 2003, and 2004 (Virginia)
6-618	A	23	19	23	22	I am not sure that estuaries with a residence time less than a day exist. I doubt it. However, increased residence time will have implications for the filtering efficiency of sediments from the fluvial input. (Morten Pejrup, Institute of Geography University of Copenhagen)	We could say "estuaries with short residence times" (Virginia)
6-619	A	23	20	23	22	There is an opportunity here to link eutrophication and HABs to terrestrial influences - altered runnof regimes due to climate change but also the effect of human activities. It fits with your theme and makes an important link. (Denise Reed, University of New Orleans)	Accepted, we will make this linkage (Virginia)
6-620	A	23	24		38	The chemical and biological consequences of this good paragraph are not presented well. There are many good experimental studies on the effects of 2X carbon dioxide pressure on biota, and many predictions of the effects on increased temperature on essential microbial processes (nitrogen fixation, denitrification, N cycling, and changes in limiting nutrients) across the continental shelf. (Gregg Brunskill, Australian Institute of Marine Science)	(see next comment)
6-621	A	23	24	23	38	This entire paragraph seems out of place. The section is about deltas, estuaries and lagoons not the coastal ocean. (Denise Reed, University of New Orleans)	Agreed, we may need to reorganize this section because nearshore continental shelf waters, barrier features and coastal plains are left out (Virginia)
6-622	A	23	29	23	33	Suggest you reference the Royal Society report http://www.royalsoc.ac.uk/document.asp?id=3249 (Carol Turley, Plymouth Marine Laboratory)	At a minimum we will add references to the scientific literature upon which the Royal Society based its report and policy

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							recommendations (Virginia) For example, Caldeira K & Wickett M E (2003). *Anthropogenic carbon and ocean pH*. Nature **425**, 365
6-623	A	23	35	23	38	Can be deleted; well explained in previous sentences (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	Disagree, there is no mention of the effects of lowering pH and saturation state on coral in the previous sentences (Virginia)
6-624	A	23	40	23	50	In the beginning of the paragraph there is a sentence about shoreline erosion, but then saltwater intrusion is discussed. The case of Gippsland Lakes is not clear. Is the saltwater invasion due to the permanent opening to the sea? (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Accepted, we will add a phrase or sentence that encompasses the increase in tidal prism as water level rises. (Virginia)
6-625	A	23	40	23	50	For the discussion of interaction between sea level rise, coastal lagoons and accelerated shoreline erosion, I would suggest that there be a discussion of a European example. I would suggest the Venice laguna be considered due to the extensive studies, as well as the engineering solutions that are currently being considered. (Magdalena Ariadne Kim Muir, Arctic Institute of North America (AINA), and EUCC-Coastal Union)	Accepted, Venice lagoon example should be added (Virginia)
6-626	A	23	44		46	Effects on hypersaline lagoons….These are very localized effects. Elsewhere, it is more likely that rising sea level will lead to problems of salinization. (Vivien Gornitz, Columbia University and Goddard Institute for Space Studies)	Accepted, we will add the caveat suggested by this reviewer (Virginia)
6-627	A	24	2	25		Although space is very limited, I recommend that some mention be made of the processes controlling wetland elevation change, in particular the subsurface processes of soil organic matter accumulation (the net balance between root growth and decomposition), groundwater flux (shrink-swell), and soil compaction. Cahoon et al in press review the effects of these processes on elevation change in salt marshes and mangrove forests. Knowledge of these processes is essential to develop best practices for managing and restoring tidal wetlands as sea levels rise. Recent papers not included in the review by Cahoon et al in press, include, Whelan et al. in press, full citation = Whelan, KRT, TJ Smith III, DR Cahoon, JC Lynch, GH Anderson. in press. Groundwater control of mangrove surface elevation: shrink-swell varies with soil depth. Estuaries; and Rogers and Saintilan, accepted, full citation = Rogers K and N Saintilan. accepted. Relationships between surface elevation and groundwater in mangrove forests of SE Australia. Journal of Coastal Research (Donald Cahoon, Patuxent Wildlife Research Center, Beltsville Lab)	Agree CW and VB will explore a diagram that will look at wetlands and CC

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6-628	A	24	2	26	3	With regard to wetland response to rising sea level, modelling by Duke University researchers (Brad Murray and student Matt Kirwan) suggests that vegetation growth and sediment trapping can keep up with sea level rise at lower rates of rise, but there would be a threshold after which the marsh would be overwhelmed. This threshold depends on vegetation growth rates and would therefore be dependent on species and average temperature. Not sure if much of this has been published but the chapter authors should be aware of this research. There are also likely to be major differences between salt marshes and brackish marshes (as found on deltas e.g. Fraser delta) because of the different plant communities involved. (Philip Hill, Geological Survey of Canada)	Agreed, the ability to keep pace with sea level and thresholds are addressed on next page. (Virginia)
6-629	A	24	2			Natural variability of these systems is hardly touched on and how this affects our ability to look at climate change impacts. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Agreed, see next page which specifically addresses natural ability of some systems to keep pace with sea level. (Virginia)
6-630	A	24	4		9	these statements are informative and more text like this would be helpful (Richard Beamish, Pacific Biological Station)	Accepted (Virginia)
6-631	A	24	4		18	Surely, in some locations, wetlands and mangroves will move landward, and not be "lost". It just so happens that many people may not choose to live in a wetland or mangrove swamp. Please present an analysis of how to decide when New Orleans, Jakarta, and Venice should be abandoned, and move all the industry, shipping, and population somewhere landward?? (Gregg Brunskill, Australian Institute of Marine Science)	Agreed, see next page which discusses natural ability of some wetlands to keep pace with sea level. (Virginia)
6-632	A	24	4	24	18	The information in this paragraph could be put in a table, or in a graphic, preceeded by a short introduction. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	(discuss with Robert- where did numbers on line 134 come from?)
6-633	A	24	4		8	Very high values of rise applied - far too high from my point of view. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	We feel these numbers are realistic and are not aware of any studies that indicate otherwise (Virginia)
6-634	A	24	4	24	14	I think it will be useful to include European comments in addition to North American examples. There are extensive analysis in relation to UK at least within Europe, and common examples for much of northern Europe (Magdalena Ariadne Kim Muir, Arctic Institute of North America (AINA), and EUCC-Coastal Union)	Agreed, we will seek results of similar studies from other countries, including Europe (Virginia)
6-635	A	24	4	26		Regarding wetlands it would be very useful if some examples from the very well investigated Dutch, German and Danish Wadden Sea appears. This coastline is one of the most prominent areas with a long history of human impact (dyke construction) and wetland development (M. Pejrup, J. Bartholdy, etc.). (Klaus Schwarzer, Institute of Geosciences, Coastal and Continental Shelf	Agreed, we will seek results of similar studies from other countries, including Europe (Virginia)

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						Research)	
6-636	A	24	4	24	18	What is meant by 'lost'? How are the percentages of 5, 18, 38 and 42 arrived at? Why no error terms? These figures are likely to be widely quoted and thus their basis needs to be clearly and firmly established. (Thomas SPENCER, Cambridge University)	Lost means converted to open water. Add some text (RN)
6-637	A	24	5	24	8	These statements about how many wetlands are 'estimated' to e lost or 'might be lost' are dramatic and include many assumptions. 'Inundate' coastal wetlands is a very strange thing to say as most of them are inundated by the tide every day.I tink this needs to be qualified with some statements such as 'if x and y occur'. There is no real reason why coastal wetlands should not be able to keep up with fairly high rates of slr (> 1cm/yr according to Morris et al) - so statements like these really need to be explained. Why do some survive and other not?? (Denise Reed, University of New Orleans)	Numbers deleted
6-638	A	24	5			Aren't coastal wetlands usually inundated by the sea? (Thomas SPENCER, Cambridge University)	Accepted. We will rephrase to indicate “permanent” inundation. (Virginia)
6-639	A	24	7		7	the projected wetland losses are relative to what baseline year? That should be added and put into the context of what we have already lost over the past decades. People may not grasp the significance of this loss without reference points. (Susanne Moser, National Center for Atmospheric Research)	Numbers deleted
6-640	A	24	15		18	I don't quite agree with this sentence; in the majority of the cases, coastal protection works are built to protect urban areas at risk so as I understand it which gives rise to "coastal squeeze" is land claim by human development (this have clearly had significant impacts on natural environment) (Luciana das Neves, Hydraulics and Water Resources Institute | Faculty of Engineer, University of Porto)	Numbers deleted
6-641	A	24	15	24	16	Not really true in North America. In fact, there is a time transgressive movement of treeline in North America: movement northward in the early Holocene in the Mackenzie Delta region (10-6ka), movement northward in the mid Holocene in central North America (when there was a southward movement in northwestern Canada, 6-4ka) and basically no movement of treeline in eastern Canada (after the ice sheet was gone at 6ks). Reference: Gajewski & MacDonald (2004) in: Long-term environmental change in Arctic and Antarctic Lakes, Kluwer Press, PIenitz et al., eds. (Konrad Gajewski, University of Ottawa)	Here we are talking about coastal forest - the realm of forests influenced by sea level change. This comment is about the movement of continental treelines (Virginia)
6-642	A	24	18			References on coastal squeeze should be cited. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Agree
6-643	A	24	20			Cahoon et al. in press (see full citation in comment # 7 above) developed a broad	Accepted, we have asked reviewer for this

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						regional to global geographical model relating wetland accretion, elevation, and shallow subsidence in different plate tectonic, climatic and geomorphic settings for both temperate salt marshes and tropical mangrove forests. This paragraph on mangrove dynamics and the last paragraph on this page on salt marshes should be updated with findings from Cahoon et al. in press. In salt marshes, the close correspondence between accretion and sea-level rise suggests they are exhibiting 'keep up' behaviour, yet many marshes exhibited significant shallow subsidence. The large variability suggests that the local process environment exerts strong influence. (Donald Cahoon, Patuxent Wildlife Research Center, Beltsville Lab)	article in press and will update accordingly (Virginia)
6-644	A	24	20	24	21	Salt marshes are supratidal areas that is situated above mean high water level. The intertidal area is the area between mean (or spring) low-water level and mean(or spring) high-water level. If Kennish, 1986 wrote what the authors quote he was wrong. (Morten Pejrup, Institute of Geography University of Copenhagen)	Many wetland ecologists refere to *Spartina* marshes as “high intertidal” or “intertidal”. There are dozens of coastal classifications and many use the term “intertidal” for salt marshes and mangroves, and some say that “supratidal” is above the high water mark, not the mean high water level (see Australian Faunal Directory). We could change the intertidal to “tidal” to make this more general though (Virginia)
6-645	A	24	20	24	34	It would be relevant to mention examples of typical rates of salt marsh accretion rates (Morten Pejrup, Institute of Geography University of Copenhagen)	They vary greatly among geographic regions, not sure there is a “typical rate”. (Virginia)
6-646	A	24	20	24	45	Data on the variability in sedimentation rates within mangrovesare provided by Saenger (2002) 'Mangrove Ecology, Silviculture and Conservation' (Kluwer) in Table 4.5. Accretion rates measured ranged up to 384 mm/year. Collapse of underlying peat is mostly confined to mangrove landscapes dominated by Rhizophora mangle, but is not widespread elsewhere. In any case, elevated CO2 concentrations generally result in a stimulation of root growth, together with the earlier onset of aerial root formation (see Saenger 2002, section 9.3.5 'Mangroves and Global Climate Change'). Specific points from this reference, could be used to enhance the section on the effects on mangroves and their landward migration. (Peter Saenger, Southern Cross University)	Will get reference from CW.
6-647	A	24	23	24	25	Why should coastal wetlands become a sink for atmospheric CO2? Because of increasing productivity? The recent article from "Borges, A.V., Do We Have Enough Pieces of the Jigsaw to Integrate CO2 Fluxes in the Coastal Ocean?, Estuaries, 28 (1), 3-27, 2005." shows the high variability of sea-air CO2 fluxes	Accepted, this would require more space to explain fully. Delete paragraph. (Virginia)

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						considering the different types of coastal ecosytems. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	
6-648	A	24	23	24	23	Add '(Agarwala et.al. 2003)' after detailed research (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	Need to review this reference first (Virginia)
6-649	A	24	25			The fact that mangroves are trees and that saltmarshes are dominated by herbs suggests that there are like;y to be differences in the patterns of response between the two systems (Thomas SPENCER, Cambridge University)	Agreed. (Virginia)
6-650	A	24	29			Some saltmarsh systems behave in this way; it is not a unique characteristic of mangroves (Thomas SPENCER, Cambridge University)	Yes, this paragraph is about mangroves, see next page about marsh response (Virginia)
6-651	A	24	31	24	31	Which coastal area in the Caribbean Sea did hurricane Mitch hit? This type of information is important for the non-specialists that will read this chapter. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Most severe loss of life was in Honduras and Nicaragua (total roughly 10,000), but El Salvador and Guatemala were also affected. (Virginia)
6-652	A	24	32			The global SET network provides a wide range of estimates of mangrove surface elevation change and near-surface accretion (see Proceedings of INTECOL 2004) (Thomas SPENCER, Cambridge University)	Consider adding statement about SET network, find summary pub (Virginia
6-653	A	24	36		45	It may be worth mentioning here that another consequence of loss of freshwater wetlands behind many mangroves and an important source of freshwater for coastal communities. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	We will add greater emphasis to salinity changes in next draft (Virginia)
6-654	A	24	36			Lack of synthesis and benefits here - what about the CO2 storage capacity of mangroves? (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Addressed on next page lines 22-27. (Virginia)
6-655	A	24	40			Well, here we have some papers that have been accepted, but not yet out, that are of direct relevance to this question. So you may simply wish to ignore this comment. As I mentioned above, we have shown that millennial-scale transitions are synchronous in Europe and North American pollen diagrams (Gajewski et al; accepted. Climatic Change). And we have produced, using pollen diagrams from across North America, a mean temperature curve for the Holocene for North America. Transitions in this curve occur at the same time as those in the North Atlantic and Greenland, and further, the reconstruction for the past 2000 years is synchronous with the Mann et al and Esper et al curve. The dominant cycle is 1150 yrs, and there is a cycle in the 14C curve at that frequency. Maximum temperatures are from 6-4ka (Viau et al., tent accepted pending revisions? JGR). However, these	Ignore. These papers are not available and they appear to focus on treeline movement at the continental scale (see comment 6-641 by this reviewer) (Virginia)

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						papers have not yet undergone scrutiny through publication. You may not wish to consider these. I note in a couple of places in the text, you are citing "submitted" papers in this chapter, and I am not convinced this is wise; until they have undergone peer review, and in fact, scrutiny by publication. (Konrad Gajewski, University of Ottawa)	
6-656	A	24	41			Kerrilee Rogers, a student of Neil Saintilan, has completed a dissertation that describes the important role of shallow subsidence in mangrove transgression into salt marshes in southeast Australia. You should cite her publications on this topic: Rogers et al. 2005: Full citation = Rogers, K. N Saintilan, H Heinjis. 2005. Mangrove encroachment of salt marsh in Western Port Bay, Victoria: the role of sedimentation, subsidence, and sea-level rise. Estuaries 28: 551-559; Rogers et al. accepted. Full Citation = Rogers, K., KM Wilton, N Saintian. accepted. Vegetation change and surface elevation dynamics in estuarine wetlands of southeast Australia. Estuarine, Coastal and Shelf Science. (Donald Cahoon, Patuxent Wildlife Research Center, Beltsville Lab)	Accepted, need to get paper which appears quite relevant and should be included (Virginia)
6-657	A	24	42	24	43	Sea level rise has been associated' is a really weak linkage and the citation supporting the statement is a wide ranging report. Find something more specific about cause-effect or remove such statements. (Denise Reed, University of New Orleans)	Accepted, the linkage is very distinct and we will reword this (Virginia)
6-658	A	24	47	24	47	delete bracketed terms (Derek Jackson, University of Ulster)	Ignore (editorial) (Virginia)
6-659	A	24	47	25	8	A key distinction is between systems that are dominated by external inputs of inorganic sediment (where future change can be modelled to some degree by predicting changing patterns of tidal inundation) and those dominated by the in situ accumulation of organic material (where the vegetation response to changed inundation is less easily modelled). The chapter needs to evaluate how these different types of saltmarsh system will be affected by different facets of climate change. (Thomas SPENCER, Cambridge University)	Considering this and the other comments on this section, we should create a graphic that shows the variables that influence the sustainability of coastal wetlands and landforms (Virginia/Colin)
6-660	A	25	0			van Wijnen and Bakker (2001) present another model of salt marsh development and the influence of sea-level rise for marshes on the Wadden Sea, which you should refer to here. Full citation: van Wijnen, HJ and JP Bakker. 2001. Long-term surface elevation change in salt marshes: a prediction of marsh response to future sea-level rise. Estuarine, Coastal and Shelf Science 52:381-390 (Donald Cahoon, Patuxent Wildlife Research Center, Beltsville Lab)	Accepted, get article and add "Wijnen and Bakker, 2001" to list of articles cited. (Virginia)
6-661	A	25	1	25	18	Is it possible to draw a conclusion on the general vulnerability (or general vulnerability trends) of saltmarsh? If the evidence is not conclusive - is it worth	We probably go as far as the literature permits on such statement. It is possible to state the

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						mentioning this fact and highlighting how can this be addressed? Perhaps more systematic national to regional scaled assessments of wetland behaviour (McFadden et al., in press)? <McFadden, L., Spencer, T. and Nicholls R.J. Broad-Scale Modelling of Coastal Wetlands: What is Required? Hydrobiologia> (Loraine McFadden, Middlesex University)	common factors that influence vulnerability or illustrate them in a graphic (Virginia)
6-662	A	25	2			The Sun et al reference appears to be about forested wetlands not about marshes. (Denise Reed, University of New Orleans)	Accepted, delete Sun *et al* reference here (Virginia)
6-663	A	25	6			The basis for these claims of varying regional losses is not clear (Thomas SPENCER, Cambridge University)	Agreed, delete or explain better – Robert? (Virginia)
6-664	A	25	10	25	20	This material needs a stronger conceptual framework. There are six points to make. 1) The key theoretical concept is that of 'accretionary balance' (vertical accretion v. sea level rise). 2) These ideas go back to the idea of a tidal energy control developed by Court Stevenson and others in the 1980s which have subsequently been shown to be over-simplified. They need to be viewed in the light of the marsh growth models proposed by JRL Allen and JR French - it is critically important that only 'mature' marshes show responses that can be linked to sea level change; younger systems are likely to be at non-equilibrium positions in the tidal frame. 3) There is a need to introduce the idea of 'sediment pulsing' in riverine / deltaic settings, developed by J Day and others. In a Mississippi context, hurricanes provide one, but not the only, pulsing mechanism. 4) Hurricane impacts do not only lead to sediment deposition in marshes. See the lieterature on Hurricane Andrew (1992) for the full range of effects. 5) The work of JR French on modelling the response of marsh surfaces to different sea level rise scenarios should be quoted. 6) This whole debate is solely in terms of vertical response. But, for example, backbarrier marshes are just as likely to be affected by barrier retreat. (Thomas SPENCER, Cambridge University)	Considering this and the other comments on this section, we should create a graphic that shows the variables that influence the sustainability of coastal wetlands and landforms (Virginia)
6-665	A	25	14	25	20	delete (Derek Jackson, University of Ulster)	Need to reword this statement in text to make it clearer. (Virginia)
6-666	A	25	15	17		Table 6.2: the following statement is somewhat confusing – the positioning of decreased is confusing. The reader has to determine whether the impacts are decreased or whether the CaCO3 saturation state has decreased – suggest clarification. “CO2 fertilisation of coastal ecosystems; decreased CaCO3 saturation impacts on coral reefs and other ecosystems” (Clive Wilkinson, Global Coral Reef Monitoring Network)	See above - need to reword this statement in text to make it clearer. (Virginia)
6-667	A	25	20			Cahoon (2003) describes the impacts of 17 hurricanes on the surface elevation dynamics of 10 salt marshes and mangrove forests around the Gulf of Mexico and Caribbean. The full range of possible responses was observed (i.e., accretion =	Accepted, add/summarize this reference. (Virginia)

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						elevation, accretion > elevation, accretion < elevation) and the results were not always intuitive. Full citation = Cahoon, D. R. 2003. Storms as agents of wetland elevation change: their impact on surface and subsurface sediment processes, Proceedings of the International Conference on Coastal Sediments 2003. May 18-23, 2003, Clearwater Beach, FL, USA. CD-ROM Published by World Scientific Publishing Corp. and East Meets West Productions, Corpus Christi, Texas, USA. ISBN 981-238-422-7. (Donald Cahoon, Patuxent Wildlife Research Center, Beltsville Lab)	
6-668	A	25	22		27	This paragraph is very brief and undeveloped, compared to the lengthy analysis of sea level change and coastal erosion elsewhere. Where is the regional prediction of the effects of hydrological, temperature, CO2 change on physical, chemical, and biological processes in the coastal zone, estuaries, and the continental shelf? Coral reefs and seagrass are mentioned, but nothing on mangroves, wetland biota, and the effect of submergence of saltpans. (Gregg Brunskill, Australian Institute of Marine Science)	Accepted, this would require more space to explain fully. Delete paragraph. (Virginia)
6-669	A	25	22	25	27	delete (Derek Jackson, University of Ulster)	Accepted. Delete paragraph. (Virginia)
6-670	A	25	22		25	While this may be true, you should put this in context of the "coastal squeeze" again - if we're losing more and more wetlands, this potential for sequestration cannot be realized. (Susanne Moser, National Center for Atmospheric Research)	Accepted, this would require more space to explain fully. Delete paragraph. (Virginia)
6-671	A	25	25	25	27	Saltmarshes and mangroves release methane and N2O. What is the source for the statement that these are negligible. Chmura et al. address only carbon sequestration. (Donald Boesch, University of Maryland Center for Environmental Science)	Accepted, this would require more space to explain and fully reference. Delete paragraph. (Virginia)
6-672	A	25	25	25	27	According to "de Bie, M.J.M., J.J. Middelburg, M. Starink, and H.J. Laanbroek, Factors controlling nitrous oxide at the microbial community and estuarine scale., Marine Ecology Progress Series, 240, 1-9, 2002.", estuaries are responsible for 60% of total marine emissions of N2O to the atmosphere. Marine CH4 emissions are very low considering other sources, but coastal areas would be responsible for 3/4 of total marine emissions. Please review the sentence. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Accepted, Delete paragraph. (Virginia)
6-673	A	25	25	25	27	Abbreviation: Greenhouse Gases (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Accepted, Delete paragraph. (Virginia)
6-674	A	25	29	25	31	See comment no. 4 (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	
6-675	A	25	29			"human impacts" is what it say and not sea level or climate.	Will change text to focus on climate change.

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						(Nils-Axel Mörner, Paleogeophysics & Geodynamics)	(RS)
6-676	A	25	29	25	42	This paragraph would be improved if there was an effort to evaluate the role of climate change vs other factors. (Denise Reed, University of New Orleans)	
6-677	A	25	29			The recent 'World Atlas of Seagrasses' priovides up to date information on seagrass taxonomy and extent (Thomas SPENCER, Cambridge University)	
6-678	A	25	31	25	34	How much are the "present losses" in % of area of original coastal ecosystems? (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Will change text to focus on future. (RS)
6-679	A	25	35			is this UV irradiance – not micron v? (Clive Wilkinson, Global Coral Reef Monitoring Network)	Agree
6-680	A	25	36	25	39	The example of El Nino influence is a special case, so it should be removed. (Stanislav Ogorodov, Lomonosov Moscow State University)	Agree
6-681	A	25	40		42	An increase in turbidity will also affect productivity as well as species distributions (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Agree
6-682	A	25	40	25	43	the statement that sea level rise will affect the depth of growth of seagrasses is over the top. Predictions of 10s of cm in rise may lead to changes of seagrass growth, but this will be insignificant amongst other factors. Such variations would be almost impossible to detect – similar situation could be claimed for coral reefs – but a 10cm change over 20 to 30m – is less than 0.1%. Not significant and not measurable. (Clive Wilkinson, Global Coral Reef Monitoring Network)	If the horizontal regression of the deep edge of a seagrass bed is compensated for by upslope migration the net effect of the rise in sea level is indeed insignificant. When shoreline armouring or natural barriers prevent upslope migration of the shallow edges of seagrass beds, the rise in sea level and concomitant upslope migration of the deep edge of the seagrass bed will result in net loss of habitat. As suggested by the reviewer, insert: “some seagrass beds occur in 20-30 m of water, so the horizontal shift caused by tens of cm increase in water depth will be a small proportion of the total bed area. However, seagrass beds also occur in turbid estuaries where the depth limit is on the order of meters, not tens of meters. The potential loss of seagrass habitat due to sea level rise could indeed be significant and measurable in these areas. The effects of elevated sea level will have the greatest impact in areas of high turbidity and lesser effects in areas of low

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							turbidity." (Virginia)
6-683	A	25	41		42	A few cm or dm will have no (or negligible) effect. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	See response to comment 6-682 above (Virginia)
6-684	A	25	44		50	OK, but not a sea level effect. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Accepted. (Virginia)
6-685	A	25	44			More recent references are required. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	accept
6-686	A	25	46	25	49	You are assuming the abrupt shifts are a response to the Milankovitch forcing, but they could also be solar variability, etc. (Konrad Gajewski, University of Ottawa)	?
6-687	A	26	0			There have been some recent papers in Nature and Science (especially by Kerry Emmanuel, either in 2004 or 2005) on recent and predicted increases in hurricane intensity and their putative relation to sea surface temperatures which deserve a mention here (Heather Viles, University of Oxford)	accept
6-688	A	26	1		3	these changes would also alter the algal species composition and potentially increase HAB incidences (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Too specific
6-689	A	26	5			Duplication with Box 1. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Duplication will be addressed during revision (Colin)
6-690	A	26	7		33	Many of these relationships are still not well understood. In many cases, the coastal waters around reefs are being polluted by nutrient inflow and toxic wastes, with associated nutrient eutrophication, overfishing has already removed many of the species involved in the predator-prey dynamics of the reef, and the greenhouse effect is associated with rising carbon levels (resulting in decreased coral growth rates), increasing sea temperatures (associated with bleaching), and increased incidence of severe weather conditions (such as hurricanes and typhoons) which can badly damage reefs. The periodic changes in weather patterns called 'El Niño' and 'La Niña', for example, often result in increases in water temperatures and subsequent coral reef bleaching, and further global warming may have implications for these weather patterns (Buddemeier 2001). Human activity may affect the emergence and frequency of a wide variety of pathogens and diseases of coral, including black band disease, white band disease, red band disease, white pox disease, rapid wasting disease, and coral plague (possibly by transfer of pathogens via the discharge of ballast waters). In the case of Jamaica, for example, the coral reefs have degraded over the last three decades from a pristine, high diversity coral-dominated environment, to a low	Useful comments on coral disease and Caribbean corals (Colin)

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						diversity algae-dominated environment (ranging from damaged to dead reef). The major factors have been overfishing, pllution (primarily excess nutrient inflow), seere storms and hurricanes, and adisease (probably viral) that wiped out a keystone species in the mid-80's, the sea urchin Diadema antillarum It is important to note, however, that only the first two of the factors listed above are anthropogenic. The other two are natural, and at least one (storm damage) occurs frequently in the Caribbean, and is in fact part of the natural dynamic processes of coral reef ecology. This highlights the probable importance of multiple 'hits'; coral reefs are probably capable of dealing with one or two of these factors at a time, but not with all of them simultaneously. Although there has been general agreement as to the nature and sequential, cumulative impact of the various negative factors, there has been considerable debate on the relative importance of the two major anthropogenic agents. Lapointe (1997: Lapointe et al 1997) has argued that the primary cause of algal overgrowth is a 'bottom-up' process, that is, caused by nutrient inflow. Others, including Hughes (1984; Hughes et al. 1999), Aronson and Precht (2000), and Edmunds and Carpenter (2001), feel that the major factor is 'top-down', that is, that the absence of herbivores which can control the algae. More recent information, including the fact that nutrient levels at many inshore locations are only slightly above those of the open ocean (Greenaway and Morrison, unpublished), and that the recovery of Diadema populations in shallow water reef areas has resulted in the removal of algae and an increase in coral recruitment (Edmunds and Carpenter 2001), indicates that 'top-down' processes are probably more important, which means that steps to control fishing pressures are more likely to result in reef improvement than steps to reduce pollution levels. See, for example, M Haley and A Clayton. The role of NGOs in environmental policy failures in a developing country: the mismanagement of Jamaica's coral reefs. Environmental Values, Vol.12, No.1, February 2003, pp 29-54 (Anthony Clayton, University of the West Indies)	
6-691	A	26	7	27	16	In chapter 4 (4.4.9), bleaching and suppression of calcification due to CO2 increase are discussed in detail as two major factors for coral reef ecosystems. On the other hand,in chapter 6 (6.4.1.4) calcification suppression is discussed by only four lines (lines 38 to 41, page 26), which is important in reef landform formation process. (Hajime Kayanne, University of Tokyo)	This needs to be resolved between chapters 4 and 6 (Colin)
6-692	A	26	7	27	16	I have a comment in relation to coral reefs and island atolls, and a more general comment about reefs. While the coverage is mostly good for these types of reefs,	I do not know of work on salinity impacts or deep-water reefs (Colin)

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						though it might be useful to include a consideration of combined effect of temperature and salinity. For example the corals of the Arabian Sea are existing at the upper end of temperature and salinity ranges, and had a significant mortality in 1998. In that sea, there is a combination of higher temperatures and increased salinity (with salinity attributable to human uses mostly right now). In the future, enclosed seas such as this and the Mediterranean will experience higher temperature and salinities. So what will be the impacts of this on coral reefs in these regions. An interesting aside to this is that some parties are monitoring the health of these reefs as an advance indication of potential risks to coral reefs elsewhere in the world. The more general comment goes to the need to recognize and consider the impact of climate change on deep water reefs, cold water reefs, and areas of high biological diversity such as sea mounts. Even warm seas like the Mediterrean have deep and cold water reefs, so what will happen there. Similarly what will be the impacts in open seas as the sea temperature rises in those seas, and what will the biodoversity impacts on these very productivity areas. Part of this goes to temperature, but may also have impacts due to changing currents and circulation patterns. (Magdalena Ariadne Kim Muir, Arctic Institute of North America (AINA), and EUCC-Coastal Union)	
6-693	A	26	7	26	42	The following references do not appear in the Refences list: pandolfi et al, 2003; Douglas, 2002; Lesser 2004; Lough, 2000; Little et al., 2004; Obura, 2005 Hoegh-Guldberg, 2004; Precht and Aronson, 2004; Gardner et al, 2003; Sheppard et al., 2005 (Bhawan Singh, Université de Montréal)	References supplied (Colin): Pandolfi, J. et al., 2003. Global trajectories of the long-term decline of coral reef ecosystems. Science, 301: 955-958. Douglas, A.E., 2003. Coral bleaching - how and why? Marine Pollution Bulletin, 46: 385-392. Lesser, M.P., 2004. Experimental biology of coral reef ecosystems. Journal of Experimental Marine Biology and Ecology, 300: 217-252. Lough, J.M., 2000. 1997-98: Unprecedented thermal stress to coral reefs? Geophysical Research Letters, 27: 3901-3904. Little, A.F., van Oppen, M.J.H. and Willis, B.L., 2004. Flexibility in algal endosymbioses shapes growth in reef corals. Science, 304: 1492-1494.

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							Obura, D.O., 2005. Resilience and climate change: lessons from coral reefs and bleaching in the western Indian Ocean. Estuarine Coastal and Shelf Science, 63: 353-372. Hoegh-Guldberg, O., 2004. Coral reefs in a century of rapid environmental change. Symbiosis, 37: 1-31. Precht, W.F. and Aronson, R.B., 2004. Climate flickers and range shifts of coral reefs. Frontiers in Ecology and the Environment, 2: 307-314. Gardner, T.A., Côté, I.M., Gill, J.A., Grant, A. and Watkinson, A.R., 2003. Long-term region-wide declines in Caribbean corals. Science, 301: 958-960. Sheppard, C.R.C., Dixon, D.J., Gourlay, M., Sheppard, A. and Payet, R., 2005. Coral mortality increases wave energy reaching shores protected by reef flats: examples from the Seychelles. Estuarine Coastal and Shelf Science: in press.
6-694	A	26	9			overfishing as a major cause of declining reef condition is a bit overstated for most coral reefs except for the Caribbean. More recently coral bleaching has been a big factor. It may be better to say it is a 'contributing factor'. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Will consider in rewriting (Colin)
6-695	A	26	9			Pandolfi et al 2003 is not in literature cited. (Donald Cahoon, Patuxent Wildlife Research Center, Beltsville Lab)	Accept (Colin)
6-696	A	26	9			"overfishing" is not a sea level problem. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Accept (Colin)
6-697	A	26	10	26	15	See comment no. 4 (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Ignore, punctuation (Colin)
6-698	A	26	11			References on recent caribbean coral reef deterioration would be helpful (Thomas SPENCER, Cambridge University)	Accept (Colin)
6-699	A	26	14		16	Is this a necessary repeat? (Susanne Moser, National Center for Atmospheric Research)	Accept , rationalize in revision (Colin)
6-700	A	26	16		19	Recent research indicates some corals may be able to tolerate warmer temps than	References to recent research included, see 6-

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						previously thought, however, much of this comes from lab studies and more work is needed. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	693 (Colin)
6-701	A	26	18		19	I don't think managers can "improve the ecological resilience of coral reefs". The solution is to reduce emissions of CO2 to the atmosphere. This is an example of a "false fix" solution. (Gregg Brunskill, Australian Institute of Marine Science)	Disagree. Wooldridge et al ref to be added provides examples of increasing reef resilience by reducing eutrophication pressures – some rewording Wooldridge, S., Done, T., Berkelmans, R., Jones, R. and Marshall, P., 2005. Precursors for resilience in coral communities in a warming climate: a belief network approach. Marine Ecology Progress Series, 295: 157-169. (Colin)
6-702	A	26	18			How will management improve the resilience of corals? (Thomas SPENCER, Cambridge University)	See 6-701 (Colin)
6-703	A	26	25	26	25	See comment no. 4 (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Ignore, punctuation (Colin)
6-704	A	26	25			corals may migrate a small way polewards but not to any major extent as they will not receive sufficient light energy (PAR) during winter months due to low sun angle and surface reflectance. Thus predominantly phototrophic corals will starve in winter and not expand towards the poles. (Clive Wilkinson, Global Coral Reef Monitoring Network)	Minor point that can be noted (Colin)
6-705	A	26	27	26	30	See comment no. 4 (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Ignore – punctuation (Colin)
6-706	A	26	30		33	Last sentence can be deleted - not relevant to focus of this chapter. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	May delete or reduce (Colin)
6-707	A	26	35			good (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	OK (Colin)
6-708	A	26	38			Note the rapid keep-up in Early Holocene time. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Accept (Colin)
6-709	A	26	38			It is not clear what is meant by 'rapid' sea-level rise. (Denise Reed, University of New Orleans)	Accept (Colin)
6-710	A	26	46		47	unfounded guess. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	See Emmanuel 2005 paper (Colin)
6-711	A	26	46			ok (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Emmanuel (2005) paper
6-712	A	26	47			should cite recent papers on intensification of hurricanes, e.g., Emmanuel,	Accept (Colin)

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						Trenberth, and others. (Susanne Moser, National Center for Atmospheric Research)	
6-713	A	26	49	26	49	Do Geng and Sugi (2003) really project an increase in tropical cyclone intensity once they reach extratropical regions? As far as I can tell, their paper does not specifically mention tropical cyclones at all. Extratropical transition of tropical cyclones was not mentioned either. How did the author of this section reach this conclusion? (Kevin Walsh, University of Melbourne)	Re-assess (Colin)
6-714	A	27	0			The whole development on deltas should be logically under 6.4.1.2 There is no sub-chapter under 6.4.2, what is at the beginning minus the Deltas should be called 6.4.2.1 Introduction. In general, this chapter is not very well constructed (Yves Henocque, Department of Fisheries)	Cannot follow point made (Colin)
6-715	A	27	1		2	Might want to include recent comments on increasing incidence of cyclones in the N hemisphere. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Agreed, see 6-712 (Colin)
6-716	A	27	4	27	16	atoll island is described in chapters 6 and 16. Of course, atoll islands are both low-lying coast and small islands and should be discussed in both chapters. However, each chapter does not seem to refer to each other. With the limitation of pages, they should share description and refer to each other. (Hajime Kayanne, University of Tokyo)	Agreed, discuss with Chapter 16 (Colin)
6-717	A	27	4		16	Proposed added sentence on increase of mean sea-surface temperature wich will permit the development of coarl reefs in new areas (if it has not be written before (p 11) (LENOTRE NICOLE, BRGM (French geological survey))	See p. 26, lines 25-27 (Colin)
6-718	A	27	4	27	4	…raised special concern. (Bhawan Singh, Université de Montréal)	Accept (Colin)
6-719	A	27	11		12	A redistribution of the sediments affecting infrastructure also implies tourism impacts as see in the Caribbean where resorts that lose beaches after cyclones see a drop in tourist numbers. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Accept (Colin)
6-720	A	27	11	27	16	delete (Derek Jackson, University of Ulster)	On what grounds should this be deleted (Colin)
6-721	A	27	12	27	16	See commetn no. 4 (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Ignore (Colin)
6-722	A	27	19			This is a very physical, direct approach to 'human settlement' impacts. The header is human society and this section needs to do more to reflect this. There are impacts on ecology and food production/productivity, for example.	722 – Agreed. Impacts on ecology and food production/productivity to be included.

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						(Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	
6-723	A	27	21		27	Climate change can also affect food security in some areas as well as income security. Food security for inshore fisheries including coral reef fisheries, income security from a loss or decline in fish resources. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	723 – Agreed. Food security to be included.
6-724	A	27	21	27	21	Change to: "Climate change affects human settlements in coastal areas in many way, including:" (Maarten Bavinck, University of Amsterdam)	724 – Corrected.
6-725	A	27	21		24	Proposal to add item : 3) possible increase in frequency and intentsity of storms and extrem events impacts on human health (e.g. Katarina or Wima cyclones) (LENOTRE NICOLE, BRGM (French geological survey))	725 – This is already in item 2.
6-726	A	27	22			10 cm or less rise would have negligible effects +50 cm or more will have some effects. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	726 – This is meant to be general; otherwise, have to specific for temperature and rainfall too.
6-727	A	27	23	27	23	change to: "(2) changing temperature" (Maarten Bavinck, University of Amsterdam)	727 – Corrected.
6-728	A	27	23			human health is a very controversial topic (ref. Paul Reiter). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	728 – Noted. See comment 880.
6-729	A	27	23		23	should also mention changed runoff patterns as rainfall may not necessarily increase (in total amount) but become more variable, more extreme (Susanne Moser, National Center for Atmospheric Research)	729 – Done. See comment 727.
6-730	A	27	23			It is no simply an increase in rainfall that impacts human health - rather it is the change in rf patterns, drier, wetter, seasonaility etc. (Denise Reed, University of New Orleans)	730 – Done. See comment 727.
6-731	A	27	24	32	19	This section makes use of the term 'sectors', which is not accurate. For instance, the 'sectors' mentioned in table 6.3 are not always such: health and 'human settlements and infrastructure' in particular. The term 'dimension' may be more suitable to capture the range of phenomena that are discussed. (Maarten Bavinck, University of Amsterdam)	731 – Retain ‘sectors’, to follow IPCC format.
6-732	A	27	26			Can Table 6.3 show whether the effects are positive or negative? (Denise Reed, University of New Orleans)	732 – Table has been improved but unable to show positive or negative effects at this stage. See comment 733.
6-733	A	27	30	27	32	The composition of the series of 'sectors' or 'dimensions' in column 1 is not made clear. Why these and not others? It looks like a quite random selection. The heading 'biological effects' in column 8 is not immediately clear. Second, note XX suggests that each so-called sector has only one single most impact. However, 'human settlements and infrastructure', and 'water resources', each have 2. Finally, it would	733 – Agreed. See comment 732. Table 6.3 revised to show more significant impacts, less significant impacts and negligible impacts or impacts not established.

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						be useful to follow the table with some points of analysis. (Maarten Bavinck, University of Amsterdam)	
6-734	A	27	30		31	Table 6.3 I do not understand. It appears temperature change and erosion has no effect on agriculture? Near this section Figure 6.3 is mentioned, and I cannot find it in my copy of this chapter. (Gregg Brunskill, Australian Institute of Marine Science)	734 – Done. See comment 733.
6-735	A	27	30			XX marks single most important impact, but some rows have more than one 'single' most important impact… admittedly they are related, but take the word single out! (Sarah Cornell, University of Bristol)	735 – Done. See comment 733
6-736	A	27	30			Table 6.3 : Tempreture change will affect Recreation and tourism, but will not affect Human settlements and Infrastructure. Is this correct ? Hotter climete will reduce the heating, while append cooling, along with design of houses and related life lines. (Hideyuki Kobayashi, Ministry of Land, Infrastructure and Transport)	736 – Agreed. See comment 733.
6-737	A	27	30			Table 6.3 -- seems to me that Flooding/Ag & forestry could also be dominant (in certain developing countries); and that Erosion/Human settlement could also be dominant (Susanne Moser, National Center for Atmospheric Research)	737 – See comment 733.
6-738	A	27	30			Table 6.3 Hard to read at a quick glance. Symbols could be used instead of XX's to mark changes. Wave climate Change should also be added as another parameter (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	738 – Table has been revised. See comment 733.
6-739	A	27	30	27	32	Table 6.3 does not ad to my understanding of the problem. There are too many single crosses and only 11 out of 42 sections do not have a marking. It could be considered only to mentioned the double crosses, single most important impact in the sector (Morten Pejrup, Institute of Geography University of Copenhagen)	739 – Done. See comment 733.
6-740	A	27	30	27	33	Could add ocean acidification/high ocean CO2 to table and then add X to Fisheries & agriculture (XX), Recreation and tourism and human settlements and infrastructure (Carol Turley, Plymouth Marine Laboratory)	740 – Ocean acidification is outside coastal zone.
6-741	A	27	35	27	36	I agree that "Societal vulnerability is regionally specific in terms of socio-economic findings". In the following examples, however, this barely comes out. Also see point 2 of my comments. (Maarten Bavinck, University of Amsterdam)	741 – Statement refers to figure 6.3.
6-742	A	27	35	27	35	Figure 6.3 is not to be found (Maarten Bavinck, University of Amsterdam)	742 – Figure 6.3 was accidentally left out by TSU.
6-743	A	27	35			Where is Fig. 6.3?	743 – See comment 742.

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						(Victor Kennedy, University of Maryland Center for Environmental Science)	
6-744	A	27	35			Can't see Figure 6.3 (Loraine McFadden, Middlesex University)	744 – See comment 742.
6-745	A	27	35			Where is fig 6.3 ?? (John Ronde de, Rijkswaterstaat/ RIKZ)	745 – See comment 742.
6-746	A	27	35	27	35	There does not appear to be a Figure 6.3 (Bhawan Singh, Université de Montréal)	746 – See comment 742.
6-747	A	27	37			Estonia is partly uplifting – the south Baltic coasts would be a better reference (e.g. Harff et al., 2001). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	747 – Corrected.
6-748	A	27	37	28	2	The Estonian mainland is relatively high elevated above the sea level (on average on 30-70 m). Low-lying areas which could be flooded occupy not more than 3-5% of the coastline extension. Besides, Estonia is a country with quite high level of development. This fact allows to doubt that any sizeable losses of expensive coastal acres would be permited. (Stanislav Ogorodov, Lomonosov Moscow State University)	748 – Done. See comment 747.
6-749	A	27	37	27	37	Estonia is NOT an extensive low lying aera. The whole Northern coastline is a cliff coast mainly of palaeozoic hard rocks. Besides it is situated in the area of uplift due to the postglcial rebound. Denmark, Germany and Poland have extensive low lying areas, if examples from the Baltic Sea should be mentioned. (Klaus Schwarzer, Institute of Geosciences, Coastal and Continental Shelf Research)	749 – Done. See comment 747.
6-750	A	28	1			Some indirect effects/synthesis impacts are missing. Such as changes in SST and its potential/known effects on hazard risk/magnitude. Magnitude and frequency changes get little attention in the chapter as a whole. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	750 – Agreed. To be incorporated where necessary.
6-751	A	28	2		4	Primarily due to subsidence. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	751 – Noted.
6-752	A	28	3			High Arctic costs and changes in permafrost etc. is not covered in this section, similar for the Antarctic - are they covered in another chapter? (Jacqueline Alder, Fisheries Centre, University of British Columbia)	752 – This is covered in the Polar chapter.
6-753	A	28	4	28	5	The sentence "Coasts which are already …" is not clear and appears not necessary in the text. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	753 – Corrected.
6-754	A	28	4			The sentence beginning 'Coasts…' does not make sense. (Denise Reed, University of New Orleans)	754 – Done. See comment 753.
6-755	A	28	5			I find it hard to believe that African coastss have a higher economic risk than Asia,	755 – Higher vulnerability as risks represented

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						which has higher population concentrated in the coast as well as a higher infrastructure investment costs. Similarly in Latin America - El Nino has a major impact on communities in the Eastern Pacific of the area including food and income security, and in some cases health. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	a high percentage of GNP for Africa.
6-756	A	28	5		6	Southeast Asia would have an even higher level of vulnerability. See Box below, p. 28-30 and p. 39,lines 49-50 and p.40, lines1-4. (Vivien Gornitz, Columbia University and Goddard Institute for Space Studies)	756 – Rejected. See comment 755.
6-757	A	28	10	30	34	This section (Box 6.4, Figure 1, Table 1) should be greatly expanded and amplified to include other megadeltas of the world, such as New Orleans, Jakarta, Holland, Venice. I suspect the impact of increasing heat, sea level, and CO2 on these regions will impact more people, food resources, disease, and potable water supplies than elsewhere in the world. The figures can be improved, and extend the coverage to other regions. (Gregg Brunskill, Australian Institute of Marine Science)	Deleted
6-758	A	28	11	28	39	Where is the legend? (Maarten Bavinck, University of Amsterdam)	Deleted
6-759	A	28	11	30		Box 6.4. Deltas are indeed hotspots for vulnerability and this is an important topic to present. But given the need to reduce the number of pages, this 3-page box should be shortened by reducing the amount of text in paragraphs 2 and 3. The second figure also needs a figure legend. (Donald Cahoon, Patuxent Wildlife Research Center, Beltsville Lab)	Deleted
6-760	A	28	11			Box 6.4 Figure1, "seven major deltas around the uplifting Himalayan-Tibetan massif" should be nine major deltas … (nine in figure 1 and table 1). (Daidu Fan, Tongji University)	Deleted
6-761	A	28	11	30	33	In our stakeholder consultations for a project on the Fraser River delta, we were surprised to learn of a community concern about salinization of irrigation water due to the upstream migration of the salt wedge under low river flow conditions (we had been focusing on wetland loss and impacts on infrastructure). Water is taken from the main river channels to irrigate fields on the delta during the summer. Rising sea level would push the average and maximum positions of the salt wedge upstream, this increasing the frequency of salty water intake at any particular location. Presumably there would be similar concerns in many highly populated deltas. I'm not sure if this is the appropriate place to mention such impacts, or perhaps 6.4.2.1 or 6.4.2.2? (Philip Hill, Geological Survey of Canada)	Deleted
6-762	A	28	39	28	39	In review' article should not be cited. Also in line 2 of p.29	Deleted

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Derek Jackson, University of Ulster)	
6-763	A	29	2	29	18	Box 6.4, Table 1: Defining the type of delta listed in the table would help better understanding the box text. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Deleted
6-764	A	29	11			Box 4 - could be shortened and duplication avoided with earlier sections. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Deleted
6-765	A	29	24		32	this paragraph is peripheral to the chapter content/purpose. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Deleted
6-766	A	29	24			Include references to Australian/NZ classifications systems such as Harris et al and Hume. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Deleted
6-767	A	29	24	29	32	It is not clear to me what this paragraph on delta geomorphology adds to the discussion (even though it is well written). (Denise Reed, University of New Orleans)	Deleted
6-768	A	29	24	29	32	The Penland model for the Mississippi delta might be useful here. (Thomas SPENCER, Cambridge University)	Deleted
6-769	A	29	34		48	Much of this paragraph could be expressed more succinctly in a table. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Deleted
6-770	A	29	34		48	Box should be focused on what climate hange means to the communities (in the table) that depend on these areas and associated issues. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Deleted
6-771	A	29	34	29	36	Which are the consequences of this processes of pyrite oxidation? (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Deleted
6-772	A	29	34	29	34	Add 'Polderization" before Drainage (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	Deleted
6-773	A	29	36			detection of high arsenic levels in the Ganges-Brahmaputra region. No reference is given (Unnikrishnan Alakkat, National Institute of Oceanography)	Deleted
6-774	A	29	37		38	high arsenic levels: in what (the air or in ground water) (Wim Salomons, Institute for Environmental Studies. Free University Amsterdam)	Deleted
6-775	A	30	1	30	15	Figure has no caption. It would useful to have a general S. America Map to localise the Plata Estuary. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Deleted
6-776	A	30	1	30	15	reference source of and caption for diagram? (Derek Jackson, University of Ulster)	Deleted
6-777	A	30	15	30	15	Title of figure is missing	Deleted

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Bhawan Singh, Université de Montréal)	
6-778	A	30	16	30	21	How much of the Parana´ basin is "regulated" through the contruction of dams? Could this decrease the sediment transport? (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Deleted
6-779	A	30	17			The Coleman reference is not in the citation list (Denise Reed, University of New Orleans)	Deleted
6-780	A	30	17	30	18	Coleman et al, 200? (Bhawan Singh, Université de Montréal)	Deleted
6-781	A	30	18		19	Only 4 values given, should be 6. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Deleted
6-782	A	30	19		20	Not if one consider the change from 5 to 6 on the southern part – there it rather looks like the oposite. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Deleted
6-783	A	30	20	30	21	The suspended sediment delivery from the river is more likely a potential control on erosion rather than the river flow. Also, although mean annual river flow may not have decreased the regime may have changed, e.g., flood flows lessened. (Denise Reed, University of New Orleans)	Deleted
6-784	A	30	23	30	33	This paragraph needs to be related more directly to climate change. (Denise Reed, University of New Orleans)	Deleted
6-785	A	30	28			Contruction of dams---add: Syvitski, J.P.M., Vorosmarty, C.J., Kettner, A.J., and Green, P., 2005. Impacts of humans on the flux of terrestrial sediment to the global coastal ocean. Science, 308, 376-380. (Vivien Gornitz, Columbia University and Goddard Institute for Space Studies)	Deleted
6-786	A	30	31			Meaning of "fractionation" here is not clear. (Donald Boesch, University of Maryland Center for Environmental Science)	Deleted
6-787	A	30	31	30	34	delete from 'The consequences….. (Derek Jackson, University of Ulster)	Deleted
6-788	A	31	1			Figure 6.3.1 presents some problems. First, is it meant to be Figure 6.3 (tht standard figure numbering scheme)? Second, it presents estimates for cliff erosion rather than as the text suggests (p.27 line 35) global pattern of sensitive coasts. Third, there is no source cited. (Donald Boesch, University of Maryland Center for Environmental Science)	Deleted
6-789	A	31	1		26	Figure 6.3.1, I have no clue where Sherringham might be, and there is no map showing the location or significance. (Gregg Brunskill, Australian Institute of Marine Science)	Deleted
6-790	A	31	1	31	26	I cannot find the reference in the text to figure 6.3.1. furthermore, the reader needs to know where the different geographical places mentioned on the vertical axis is	Deleted

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						situated. (Morten Pejrup, Institute of Geography University of Copenhagen)	
6-791	A	31	1	31	26	There does not appear to be any reference in the text to Figure 6.3.1. (Bhawan Singh, Université de Montréal)	Deleted
6-792	A	31	21	31	25	Add in text explaining where study was conducted (Country). (Derek Jackson, University of Ulster)	Deleted
6-793	A	31	21			Figure 6.3.1 -- make clear in this Figure that this is in the U.K. (Susanne Moser, National Center for Atmospheric Research)	Deleted
6-794	A	31	21			Figure 6.3.1 is located out of position - page 31 but referred to on page 21! (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Deleted
6-795	A	31	21		25	precise in figure 6.3.1 legend that these locations are in UK (LENOTRE NICOLE, BRGM (French geological survey))	Deleted
6-796	A	31	29	31	31	The sentence is not clear and too long. The issues about tourism and recreation are important economically. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	796 – Agreed. To be revised.
6-797	A	31	29	31	33	This paragraph includes too amny braod generalisations to contribute any substance to the chapter.Also it seems to contradict some of the staments in the paragraph beginning on line 42 where generalizations can be made - how? If not enough is known….? (Denise Reed, University of New Orleans)	797 – Agreed. To be revised.
6-798	A	31	29		29	Fisheries is an important and growing global sectors which impacts on the coast (Trawling and in particular fishing ponds in Mangroves). (Wim Salomons, Institute for Environmental Studies. Free University Amsterdam)	798 – Only coastal fisheries to be considered.
6-799	A	31	30	31	32	Although it is true that "our understanding of impacts on the developing countries are rather limited", more can be said. Also see my comment 2. (Maarten Bavinck, University of Amsterdam)	799 – Agreed. To be revised.
6-800	A	31	31	31	33	Why have 'health' and 'water resources' been chosen? There are many other possible topics. This is probably dealt with in an earlier chapter. (Maarten Bavinck, University of Amsterdam)	800 – Sectors are chosen by IPCC.
6-801	A	31	32			revise text from "small magnitude of climate change" to "small magnitude change in climate" (Donald Cahoon, Patuxent Wildlife Research Center, Beltsville Lab)	801 – Corrected.
6-802	A	31	35	31	40	This paragraph does not add much to the text. It has been already said in section 6.3.2 (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	802 – Agreed – paragraph deleted.
6-803	A	31	37	31	38	It might help to present an example or two of 'nonlinearities'. (Maarten Bavinck, University of Amsterdam)	803 – NA. See comment 802.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
6-804	A	31	37	31	40	This argumentation implies that there arein the majority linear interactions. I have doubts about this. But if there is reference on this and if some examples could be presented, this statement of the authors would be better justified. I would especially appreciate at least one example for a conflict with the functioning of coastal ecosystems, which would be an ecological argument. Or do you mean a confict due to losses of ecological services? Which would be a socio-economic argument. (Wilhelm Windhorst, Kiel University)	804 – NA. See comment 802.
6-805	A	31	40			insert the word "natural" before 'functioning" (Donald Cahoon, Patuxent Wildlife Research Center, Beltsville Lab)	805 – NA. See comment 802.
6-806	A	31	40			…….and the morphological and sediment dynamics of the coast (Loraine McFadden, Middlesex University)	806 – NA. See comment 802.
6-807	A	31	42	32	2	this paragraph repeats much of the text and ideas from earlier, b ut doesn't have the impact and focus (or location) of a concluding summary. If the 3-point listing is important, it should be in the earlier section. Line 7 p 32 should be thermoHALINE circulation. (Sarah Cornell, University of Bristol)	807 – Corrected.
6-808	A	31	42			The subsection heading (6.4.2) is 'consequences for human society', yet this paragraph discusses consequences of human society. Would this paragraph be better placed elsewhere? (Loraine McFadden, Middlesex University)	808 – Rejected. It is “consequences of climate change for human society”.
6-809	A	31	48		49	Speculations – see general comments. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	809 – Noted. See comment 812.
6-810	A	31	48		50	Seems like that has been said now at least 3-4 times already and gets repetitive beyond need. (Susanne Moser, National Center for Atmospheric Research)	810 – Noted. See comment 812.
6-811	A	31				Figure 6.3.1 should be moved to page 21 (Denise Reed, University of New Orleans)	811 – Corrected.
6-812	A	32	4	32	19	Possible duplications from section 6.3.2; can be reduced or deleted (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	812 – Agreed. Paragraph to be revised.
6-813	A	32	4	32	19	The section coiuld be reduced. Summarizing implausible model scenarios to lead to an ambiguous finding, requiring further research, is not an efficient use of space. (Franklin Schwing, NOAA Fisheries Service)	813 – Agreed. See comment 812.
6-814	A	32	5	32	6	Another critical threshold is the relationship between coral calcification and aragonite saturation state such that a doubling of atmospheric CO2 causes up to a 30% decrease in coral calcification rate. (Carol Turley, Plymouth Marine Laboratory)	814 – Agreed. See comment 812.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
6-815	A	32	7			"Thermocline Circulation (THC) " may be changed to "Thermohaline Circulation". (Normally, THC refers to Thermohaline Circulation) (Unnikrishnan Alakkat, National Institute of Oceanography)	815 – Corrected.
6-816	A	32	8	32	19	These extreme-case scenarios need a better link to previous text, and a clearer statement of why they are in this section. The description of the 5m slr case studies should be in there, but should be flagged clearly as an 'out-there' scenario. The 'conclusions' as they stand look almost like suggestions that abandonment should begin now - the policy message is blurred here, and it should be handled with care! The last sentence is a good basis for an intro sentence for this paragraph. (Sarah Cornell, University of Bristol)	816 – Agreed. See comment 812.
6-817	A	32	16			add reference for FUND model (Susanne Moser, National Center for Atmospheric Research)	817 – Agreed. Reference to be added.
6-818	A	32	16			I didn´t find an explanation of this abbreviation, nor is there a reference. A short hint about the charakter of FUND. (Wilhelm Windhorst, Kiel University)	818 – Agreed. See comment 817.
6-819	A	32	17		18	Yes "extreme", unfounded andtotally speculative – not to say pure nonsence. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	819 – Rejected. An opinion.
6-820	A	32	18			reference required (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	820 – Agreed. Reference to be added.
6-821	A	32	21	32	23	Change to 'Fresh water resources' (Maarten Bavinck, University of Amsterdam)	821 – Corrected.
6-822	A	32	23		47	Compared to the examples and analysis given to coastal erosion and sea level change, this section (and that following) needs more quantitative analyses, examples, and illustrations. What % of metropolitan land will be lost, what % of water supplies will be lost, and how will Jakarta tolerate increased floods and too much freshwater? Concerning thresholds above in lines 4-19, there are also "tipping point" thresholds in marine chemistry (titration of the carbonate buffer by carbonic acid), changes in the capacity of the surface layer of the coastal ocean to adsorb CO2, changes in North Atlantic Deep Water formation, and this ocean circulation. (Gregg Brunskill, Australian Institute of Marine Science)	822 – Noted. Will consider only those with impacts on human society in this section.
6-823	A	32	28			which areas and why? (Donald Cahoon, Patuxent Wildlife Research Center, Beltsville Lab)	823 – Rejected. This sentence is meant to be general and for table 6.3 and also chapter 3.
6-824	A	32	29	32	29	(...) for some metropolitan areas and touristic settlements located at the coast.... (João Figueira de Sousa, Universidade Nova de Lisboa)	824 – Corrected.
6-825	A	32	29		30	Comment : moreover :the overpumping of groundwater will cause artificial subsidence (LENOTRE NICOLE, BRGM (French geological survey))	825 – Corrected.

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6-826	A	32	30			after end of paragraph, add example and references (Susanne Moser, National Center for Atmospheric Research)	826 – Agreed. Reference to be provided.
6-827	A	32	32	32	38	In addition to reference to Europe and the Mediterranean and Black Sea, there shoud be reference to southern Spain and Portugal, which experiencing similar changes though based on the Atlantic. For management purposes in responding to climate changes, southern Spain and Portugal are often included with the Mediterrenean region. (Magdalena Ariadne Kim Muir, Arctic Institute of North America (AINA), and EUCC-Coastal Union)	827 – Rejected. Southern Spain and Portugal are in the Mediterranean.
6-828	A	32	36			See my paper in Z. Geomorph.N.F., Supl.Vol. 137, 91-102, 2005. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	828 – Agreed. Reference to be read.
6-829	A	32	39	32	47	This paragraph introduces the contrast between areas in which runoff decreases, and areas in which runoff increases. It would help to point out some implications of this statement: why is this important? (Maarten Bavinck, University of Amsterdam)	829 – Agreed. Paragraph to be revised.
6-830	A	32	39	32	39	Replace 'future population' by 'human condition' (Maarten Bavinck, University of Amsterdam)	830 – Corrected.
6-831	A	32	39	32	47	As one reads the chapter there are many comments like this one. It would be useful if these can be tied together at the end. When I got to the end, I felt that I had been presented with a lot of information, but it was up to me to tie it together. I understand that this is a difficult thing to do, but without this integration the message is not clear. (Richard Beamish, Pacific Biological Station)	831 – Agreed. See comment 829.
6-832	A	32	39	32	40	Not sure what this sentence really means when I read it carefully. Often in this section, the use of the scenarios is described as if they were truth, not illustration. The scenarios are a way to imagine what the population in stressed watersheds would be, but occasionally, the text reads as if the scenarios were objective paths to the future. (Sarah Cornell, University of Bristol)	832 – Agreed. See comment 829.
6-833	A	32	39			Duplication with chapter 3? And earlier section on SRES in this chapter? (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	833 – Agreed. See comment 829.
6-834	A	32	46	32	46	Which six models ? (Morten Pejrup, Institute of Geography University of Copenhagen)	834 – Agreed. To be checked and revised.
6-835	A	32	49			subheading should also include ECOLOGY as this is discussed in this chapter and there is very little coastal 'forestry' (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	835 – Agreed. Coastal forestry is not well defined, but ecology is not a separate sub-sector.
6-836	A	32	49	32	49	The word "forestry" should be cut out from the title of section 6.4.2.2 as nothing is	836 – Noted. See comment 835. Forestry is to

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						mentioned about forestry inside this section. (Stanislav Ogorodov, Lomonosov Moscow State University)	be included but will check literature in revision.
6-837	A	32	49	33	5	Need to mention the thread of high ocean CO2 and low ocean pH on marine ecosystems, foodwebs and fish production - again check out the Royal Society report. Remember lots of aquaculture are shell fish, that have calcium carbonate shells, so they may have real problems producing shells - there is particular concern for the juvenile stages and therefore recruitment (Carol Turley, Plymouth Marine Laboratory)	837 – Agreed. To be considered in revision of this subsection.
6-838	A	33	0			In the future projection on impacts of extreme sea level- The past experience on the impacts of extreme sea level along the east coast of India and the coast of Bangaldesh shows that there have been less loss of human life in the recent years compared to the past due to improved warning system, improved communications and socio econonomic factors. Loss of lives can be expected to be minimum in future. This point is not reflected in the discussion. Even the loss of property also may be expected to be reduced, assuming that movable property can be shifted with a better warning system (This is a general view, as I am not an expert on socio economic issues) (Unnikrishnan Alakkat, National Institute of Oceanography)	838 – Rejected. Comments are more relevant for the adaptation section.
6-839	A	33	1	33	1	Note here that climate change has led not only to abundance fluctuations, but to changes in distribution etc. See line 15-17 (Maarten Bavinck, University of Amsterdam)	839 – Corrected. See comment 840.
6-840	A	33	1			perhaps write that climate now is recognized as a major factor affecting fish abundances (not climate change) (Richard Beamish, Pacific Biological Station)	840 – Corrected. See comment 839.
6-841	A	33	1			Does this statement refer to climate variability or climate change? (Donald Boesch, University of Maryland Center for Environmental Science)	841 – Done. See comment 840.
6-842	A	33	1	33	23	6.4.2.2 development is not in coherence with the title. It should start with Agriculture, then Forestry and then Fisheries. Instead, we have Fisheries/Aquaculture/Agriculture and nothing on forestry. The information included in the Millenium Ecosystem Assessment should have been used here (see Page 125 of the Pre-publication final draft) (Yves Henocque, Department of Fisheries)	842 – Agreed. See comment 844. References to be checked.
6-843	A	33	1		33	add maybe some info that was gathered in the Millennium Ecosystem Assessment that could strengthen this section (Susanne Moser, National Center for Atmospheric Research)	843 – Agreed. See comment 844.
6-844	A	33	1	33	23	Given the very significant impact climate change is already having on coastal and estuarine fisheries, this section could benefit from being significantly augmented,	844 – Agreed. This section is to be revised.

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						with more examples provided of concrete impacts and shifts. For example, the UK State of the Seas report indicates some of the changes occurring in the food web, which in turn affects fish populations. Due in part to shifting temperatures, there have been shifts in fish populations in the North Sea, where fish stocks in the Norwegian and EC waters are shifting to Icelandic waters. There are been parallel shifts in the Barents and Bering Sea. Part of the dilemma for fish stocks are difficulties in separating climatic impacts, from impacts of overfishing and increasing destruction of coastal and estuarine habitat, which also need to be highlighted. This interlink may also need to be highlighted, and parallels the interaction between human uses and developments, and climatic impacts and shifts for coasts. (Magdalena Ariadne Kim Muir, Arctic Institute of North America (AINA), and EUCC-Coastal Union)	
6-845	A	33	1	33	23	This section is particularly weak. The discussion of aqauculture is very unclear and it seems that mariculture, which is not mentioned, may be more susceptible to changes in coastal processes associated with climate change. The paragraph beginning on line 15 seems out of context. (Denise Reed, University of New Orleans)	845 – Agreed. See comment 844.
6-846	A	33	5	33	5	Add some references. (Maarten Bavinck, University of Amsterdam)	846 – Agreed. See comment 844.
6-847	A	33	7		10	Water quality and primary production as well as wave climte are linked closely with aquaculture along the coast. In a climate change framework concern should be on HAB as nutrients and water conditions resulting in changes in productivity as well as the species composition of algae in coastal waters. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	847 – Agreed. See comment 844.
6-848	A	33	15		17	Some species of fish may be able to survive in changes up to 4C. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	848 – Agreed. See comment 844.
6-849	A	33	15		17	In terms of fish and invertebrate distributions in marine areas - temperature at depth will be an influence below the surface more than weather/climate. Salinity is also important driver for reproduction especially for species that spawn in estuaries and other coastal habitats. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	849 – Agreed. See comment 844.
6-850	A	33	15	33	17	Change to "Climate and weather affect the distribution", and move the whole paragraph to above line 1. (Maarten Bavinck, University of Amsterdam)	850 – Corrected.
6-851	A	33	15	33	17	Comments on interactions between climate, species and biodiversity also need to be strengthened. I would refer to Chapter 10: Principles of Conserving Arctic	851 – Rejected. Comments on Arctic go to the Arctic chapter.

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						Biodiversity of the ACIA Scientific Report which discusses these matters in a circumpolar Arctic context. (http://www.acia.uaf.edu/PDFs/Ch10_Pre-Release.pdf), as well as European perspective, MB Usher, Conserving European Biodiversity in the Context of Climate Change, draft paper for Council of Europe, 2005). Refer also to Recommendations on Climate Change and Biodiversity Conservation: Knowledge Needed to Support Development of Integrated Adaptation Strategies (see www.epbrs.org). (Magdalena Ariadne Kim Muir, Arctic Institute of North America (AINA), and EUCC-Coastal Union)	
6-852	A	33	15			Need more on this or as part of the section on natural systems. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	852 – Agreed.
6-853	A	33	15	33	17	Aragonite concentrations also determine the distribution and survival of many species (corals, many plankton, shell fish and organisms such as the pteropods that play such an important role in the Antartic foodweb) (Carol Turley, Plymouth Marine Laboratory)	853 – Agreed. See comment 837.
6-854	A	33	19	33	23	Why discuss only rice in this context, and not other crops or e.g. forestry? (Maarten Bavinck, University of Amsterdam)	854 – Noted. Rice is most important. Forestry is in a different subsection.
6-855	A	33	22	33	22	… impacts on coastal areas with high-value (RICE?) plantation crops." (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	855 – Corrected.
6-856	A	33	25	34	9	I think in section 6.4.2.4 is really worthwhile empahasizing the fact that most of the phenomenon concerning coastal erosion, coastal flooding and even at some extent climate change are natural phenomenon which have always existed and helped to shape coastlines throughout history, but because of current and forth scale of people and assets at risk these are far from natural. As I see it these natural phenomenon are problems in the extent of the potential hazardous to human development along the coast. (Luciana das Neves, Hydraulics and Water Resources Institute | Faculty of Engineer, University of Porto)	856 – Agreed. This section is to be revised.
6-857	A	33	27			I would disagree with distribution of human populations - there are concentrations in North America and the Middle East - Cairo for starters. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	857 – Agreed. See comment 858
6-858	A	33	27	33	28	This sentence suggests that it is mainly Europe and 'parts of Asia' that have coastal populations. Reformulate. (Maarten Bavinck, University of Amsterdam)	858 – Agreed. Sentence to be reformulated.
6-859	A	33	27	34	9	Surely some concrete lessons, examples and illustrations from the disasters of the Indian Ocean tsunami in Sumatra and Sri Lanka, the flooding of coastal Louisiana,	859 – Agreed. See comment 856.

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						Texas, Alabama could be found here. If the richest country in the world cannot manage a city that is below sea level during a cyclone, then other locations in the world are doomed. There is no mention of the health aspects, heat waves causing death. Again, the 22 megacities of the world mentioned in line 45 should be illustrated and completely listed, with area and population, water and food requirements when disaster strikes, rapidly or slowly. This is the "reverse footprint" mentioned earlier. (Gregg Brunskill, Australian Institute of Marine Science)	
6-860	A	33	27	33	43	in', not 'to' in first two lines; the second sentence should be the first, and a slightly more critical, systematic and objective assessment of the regional differences in coastal habitation in the first para would make this whole section better. Is N America the only region with coastal development? population growth? etc. Issues of vulnerability/risk/hazard in second paragrpah are blurred too - is the greatest increase in vulnerablitiy primarily related to greatest increase in people in these coasts? (Sarah Cornell, University of Bristol)	860 – Corrected.
6-861	A	33	27	34	9	For the human settlement, infrastructure and development, sea level rise will continue well into the future. Planning and planning for that needs a long term strategy in the developed countries and a long term assessment with support for developing countries. Given the extensive research as well as the high vulnerabilities within Europe, I would suggest the inclusion of relevant examples and case studies from Europe. For example, London and the Thames Estuary are currently protected to a high standard (generally 1:1000 years or 0.1% at the year 2030). The design of the Thames Barrier allowed for sea level rise but did not make any specific allowance for changes due to climate change in fluvial flows coming down the Thames or the size of storm surges arising in the North Sea. Rising sea level and rapidly increasing development within the tidal flood plain mean that flood risk is increasing and by the year 2030, improved arrangements will be required if flood protection standards are to be maintained at present levels (cite, T Reeder et al, Broad Scale Tidal Flood Risk Assessment for London using MDSF and FLOODRANGER, paper for 3rd National CIWEM Conference, October 2004) Two other European examples are the Venice laguna and the central coastal region of Portugal. The Venice laguna, its infrastructure and its communities are very vulnerable to sea level rise and storm events, with natural and human-induced vulnerability augmented by climatic changes. Venice is not only threatened by high tides, but is sinking through subsidence, at the same time as the Adriatic Sea is rising. The surrounding marshes which used to break the waves coming into the	861 – Agreed. See comment 856.

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						city have gradually disappeared, and industrial development on the mainland has added to the increased subsidence and pollution (O Ravera, The Lagoon of Venice: The result of both natural factors and human influence, J. Limmol 59(1) 10-30, 2000). The Moses project, which is comprised of 79 barriers, was approved in 2003, is now estimated to cost more than 5 billion euros, and is designed to rise from the seabed to block the inlets of the Venice laguna from the Adriatic Sea when high tides are forecast. The Atlantic coast in the central region of Portugal and settlements such as Aveiro and Figueira da Foz are also very vulnerable to combination of climatic changes and coastal erosion, storm events, and changes in sediment deposit due to coastal dikes and groins and upstream dams. (Magdalena Ariadne Kim Muir, Arctic Institute of North America (AINA), and EUCC-Coastal Union)	
6-862	A	33	32	33	35	Remove sentence "In North America…Chapter 14). (Maarten Bavinck, University of Amsterdam)	862 – Corrected.
6-863	A	33	32	33	35	This comment is valid for coastal areas all over the world, and not only in the USA. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	863 – Done. See comment 862
6-864	A	33	32		35	This is also the case in several parts of Europe (inter alia Portugal and south Spain). (Luciana das Neves, Hydraulics and Water Resources Institute | Faculty of Engineer, University of Porto)	864 – Done. See comment 862.
6-865	A	33	37	33	37	Change 'global pattern' to 'impact' (Maarten Bavinck, University of Amsterdam)	865 – Corrected.
6-866	A	33	37		41	This can also happen in highly developed areas, when ecological risks are underestimated as the example of New Orleans clearly demonstrates.Thus, it might be necessary to rewrite this paragraph. (Wilhelm Windhorst, Kiel University)	866 – Agreed. See comment 856.
6-867	A	33	38			topography is an important factors, but isn't geology also? (Jacqueline Alder, Fisheries Centre, University of British Columbia)	867 – Corrected by using “and other environmental factors”.
6-868	A	33	38			the number of people as well as the value of related infrastructure exposed to storm surges are related to the severity of the impact. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	868 – Corrected.
6-869	A	33	43			which of the two Few et al., 2004 reference is it? (Susanne Moser, National Center for Atmospheric Research)	869 – Reference to be checked.
6-870	A	33	45	33	45	twenty-two instead of 22 mega cities… (Bhawan Singh, Université de Montréal)	870 – Corrected.
6-871	A	33	46		47	"flooding and salinization of surface water" Add: and coastal aquifers (LENOTRE NICOLE, BRGM (French geological survey))	871 – Corrected.

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6-872	A	33	48	33	49	The text says "One flood model predicts that in 1990 approximately 10 million people per year experienced coastal flooding…" It would seem that there should be data for 1990, not a model prediction. (Lenny Bernstein, IPIECA)	872 – Noted. Information to be checked.
6-873	A	33	49			reference required (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	873 – Reference to be supplied.
6-874	A	34	2		4	Totally irrelevant "maximum frightening" data. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	874 – This refers to the model.
6-875	A	34	6	34	50	Extreme weather risk could be more focused on within this text, with "flooding and erosion" referred to in line 44, and reference to "natural and man made coastal defenses" in line 45. Line 46 would also benefit from reference to changes in variation of availability of fish as food, and impact of invasive species which would benefit from warmer temperatures. (Magdalena Ariadne Kim Muir, Arctic Institute of North America (AINA), and EUCC-Coastal Union)	875 – Agreed. See comment 876.
6-876	A	34	6	34	9	This paragraph seem sout of place with the rest of the section. (Denise Reed, University of New Orleans)	876 – This refers to possible impacts of rapid or catastrophic climate change on coastal cities. To be revised.
6-877	A	34	6	34	9	Worth revisiting this statement after Hurrican Rita? Also see outcome from the Avoiding Dangerous Climate Change Symposium, Feb 2005, (Exeter http://www.stabilisation2005.com/) (Carol Turley, Plymouth Marine Laboratory)	877 – Agreed. See comment 856.
6-878	A	34	8			replace "could" with "would" (Susanne Moser, National Center for Atmospheric Research)	878 – Corrected.
6-879	A	34	9			add something here on what would no longer function or be impaired (Susanne Moser, National Center for Atmospheric Research)	879 – Agreed. See comment 876.
6-880	A	34	14	34	15	It is essential to explain the linkage between disasters and human health (compromised water supply, etc.). (Denise Reed, University of New Orleans)	880 – Agreed. This section is to be revised. See also comment 728.
6-881	A	34	16			clumsy sentence structure - put ' in developing countries' as a clause at the start of the sentence, because the list of infectious diseases looks wrong as things stand. Also line 24 needs style-check (Sarah Cornell, University of Bristol)	881 – Corrected.
6-882	A	34	16	34	16	Typing mistake: ,, (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	882 – Corrected.
6-883	A	34	17	34	19	I do not follow how in industrialized countries outbreaks of infectious diseases are rare because 'public health concerns are more related to mental health problems'.	883 – Agreed. See comment 880.

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						(Peter Saenger, Southern Cross University)	
6-884	A	34	18			might want to include the capacity to mobilize national health programs to prevent disease as seen in recent disasters (Jacqueline Alder, Fisheries Centre, University of British Columbia)	884 – This is quoting from Hajat et al. 2003. However, this section will be revised. See comment 880.
6-885	A	34	18			are rare (Richard Beamish, Pacific Biological Station)	885 – Corrected.
6-886	A	34	21			This para should recognize that despite the links between some pathogens and vectors to climatic variables, socio-economic factors may be more critical for public health. The actual prevalence of malaria, for instance, does not coincide either with its historical or potential range based on the presence of the malaria transmitting vectors and/or the malaria parasite. The current range of malaria is dictated less by climate than by human adaptability, and despite any global warming that might have taken place over the past century (or more), malaria has been virtually eradicated in richer countries although it was once prevalent there (e.g., the U.S. and Italy) . This is because, in general, a wealthier society has better nutrition, better general health, and greater access to public health measures and technologies targeted at controlling diseases in general and malaria in particular. In fact, analysis by Tol and Dowlatabadi (2001) suggests that malaria is functionally eliminated in a society whose annual per capita income reaches $3,100. Taking into consideration that under all SRES scenarios incomes are expected to grow few, if any, countries will be below the $3,100 threshold in the 2080s. Moreover, given the rapid expansion in our knowledge of diseases and development of the institutions devoted to health and medical research, one can be relatively confident that the $3,100 threshold will almost certainly drop in the next several decades as public health measures and technologies continue to improve and become more cost-effective. {Goklany 2003] [Refs: [1] Tol, R.S.J. and Dowlatabadi, H.: 2001, 'Vector borne diseases, development & climate change', Integrated Assessment 2, 173-181. [2] Goklany 2003, provided at the end.] (Indur Goklany, Office of Policy Analysis, Department of the Interior)	886 – Agreed. See comment 880.
6-887	A	34	21		30	The other opinions – by experts (e.g. P.Reiter) – not even mentioned. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	887 – Agreed. See comment 880. Reiter 2005 to be considered.
6-888	A	34	22	34	24	the sentence is not clear. The vectors for such diseases would also increase in numberconsidering higher temperatures? (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	888 – Agreed. See comment 880.
6-889	A	34	22	34	24	Syntax error with this sentence. (Bhawan Singh, Université de Montréal)	889 – Agreed. See comment 880.

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6-890	A	34	30			Flooding could also expose methy mercury as seen when dams have resulted in increased Hg concentrations due to naturally occuring Hg in the soils. Also the exposure of acid sulphate soils in many tropical coastal areas. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	890 – Agreed. See comment 880.
6-891	A	34	32	34	34	the link between climate change and altered marine ecosystems isn't stated at all here, but presumably it is being invoked. As in comments 6 and 8 above, there is rather limited robust science explicitly linking temperature changes with HABs, etc, but it must be a control. (Sarah Cornell, University of Bristol)	891 – Agreed. See comment 844.
6-892	A	34	32			Marine ecological process also plays…' (Stephen J. Hawkins, The Marine Biological Association of the UK)	892 – Corrected.
6-893	A	34	32			Relevance/relation to climate change? This needs to be made clear or this section omitted. It is disjointed. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	893 – Agreed. See comment 844.
6-894	A	34	32			Marine ecology' is far too general a term to use here - ecology affects everything…. (Denise Reed, University of New Orleans)	894 – Agreed. See comment 893.
6-895	A	34	32	34	34	Loss of or changes to marine bioresources, especially to coastal third world countries where they are an important food resource. Also deoxygenation of coastal waters due to increased thermal stratification may have a health impact (H2S, N2) production) (Carol Turley, Plymouth Marine Laboratory)	895 – Agreed. See comment 880.
6-896	A	34	36	34	41	This paragraph seems duplicative of information presented elsewhere. (Denise Reed, University of New Orleans)	896 – Noted. See comment 880.
6-897	A	34	40	34	40	"… may INDUCE…" (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	897 – Corrected.
6-898	A	34	40	34	40	...may induce… (Bhawan Singh, Université de Montréal)	898 – Done. See comment 897.
6-899	A	34	43	34	46	See comment no. 4 (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	899 – Unable to response to comment listed as no. 4.
6-900	A	34	43	34	46	To remove: “Deforestation and ensuing changes in land-use, ... in some regions of the world (Patz, 2001)". (João Figueira de Sousa, Universidade Nova de Lisboa)	900 – Noted. See comment 880.
6-901	A	34	48			why not keep future research in one section (Richard Beamish, Pacific Biological Station)	901 – Noted. See comment 880. To be rephrased to emphasize complexity.
6-902	A	34	49	34	49	Abbreviation: GCMs = global circulation models? (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	902 – Corrected.
6-903	A	34	49	34	49	Has GMC been explained other places in the text?	903 – Done. See comment 902.

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						(Morten Pejrup, Institute of Geography University of Copenhagen)	
6-904	A	35	1		6	The capacity to mobilize resources to deliver programs and infrastrucutre is needed as well. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	904 – Corrected.
6-905	A	35	1			"need to BE BETTER? known" (Susanne Moser, National Center for Atmospheric Research)	905 – Corrected.
6-906	A	35	8	36		This section on tourism and recreation does not mention how temperature and rainfall pattern changes may impact water quality in coastal areas, how this may lead to more beach closures, and hence have substantial economic impacts on coastal recreation/tourism. A day of beach closure is rather expensive! (Susanne Moser, National Center for Atmospheric Research)	906 – Noted. This section is to be revised.
6-907	A	35	10	35	13	travel to sunny beach destinations', and the WTO 2020 report doesn't just refer to beach arrivals, so the trend information in the document is more useful than this single statistic. (Sarah Cornell, University of Bristol)	907 – Noted. Major tourist flows are from north Europe to Mediterranean (especially beach holidays).
6-908	A	35	10	35	13	Does the Mediterranean area get 15% of the 1.56 billion arrivals? Or 15% of the tourist coming from North Europe? (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	908 – Noted. This is 15% of world's total.
6-909	A	35	10		13	Speculations (at the best) or real desinformation. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	909 – Noted. This is from World Tourism Organisation.
6-910	A	35	10	36	3	There is considerable research and practical projects currently underway examining impacts on climate change at a global and European level. For example, see the European climate change and sustainable tourism initiative under the the European Network of Coastal Practioners, http://www.coastalpractice.net; or UN affliated World Tourism Association (http://www.world-tourism.org), and the Djerba Declaration on Tourism and Climate Change, (http://www.world-tourism.org/sustainable/climate/decdjerba-eng.pdf). In lines 19 to 21, please extend references to water shortages and impact on tourism from southeast Mediterranean to throughout Spain and Portugal, particularly in the summer of 2005. In the discussion of the corals at the botton of page of 35, there is the first reference to impacts of acidification on corals, which is commendable, but needs to be extrapolated throughout the text. (Magdalena Ariadne Kim Muir, Arctic Institute of North America (AINA), and EUCC-Coastal Union)	910 – Agreed. See comment 906.
6-911	A	35	10	36	3	Not every bahavoir of tourists can be related to climate change. If sunny beaches are no longer visted by tourists as in times before the reason might not be higher temperatures but the behavoir that tourists go several times a year just for 1 week	911 – Agreed. See comment 906.

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						than 1 time for three weeks. The influence of UV radiation is as well a subject of discussion. Spending much time on the beach has no longer first priority for tourists. About coral bleaching and the decline in the numbers of divers visiting those areas. For a coral it does not matter if it is destroyed by the coral bleaching or by a high number of touristic divers. Consequence: Not every adverse effect to the environment should be related to climate change. Here the authors should be a little bit more critical. (Klaus Schwarzer, Institute of Geosciences, Coastal and Continental Shelf Research)	
6-912	A	35	11			Need percentage for Caribbean (there is one given for Med) (Victor Kennedy, University of Maryland Center for Environmental Science)	912 – Noted, currently unavailable.
6-913	A	35	15		23	Changes in reef related tourism can be dramatic in places such as the Caribbean and Red Sea - events such as hurricanes and terrorist attacks prove this. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	913 – Agreed. See comment 906.
6-914	A	35	15	41	27	An example of redundancy - factors influencing tourist destinations are described both on page 35 and 41. Here is an example of where the text can be shortened. (Donald Cahoon, Patuxent Wildlife Research Center, Beltsville Lab)	914 – Agreed. See comment 906.
6-915	A	35	15	35	23	Again, descriptions of scenarios presented as empirically determined relationships, and when those relationships are found, the type of scenario isn't described. What is the Parry 2000 article? I think the opening sentence can be more generic - this is a very small-region, UK tourist-market view! But shifts in seasonality and location preference are likely to be true elsewhere - as Lise and Tol determine. Agnew and Viner 2001 look at CC and tourism, and the European eCLAT project (ESF report, 2003 http://www.cru.uea.ac.uk/tourism/esf_home.html) (Sarah Cornell, University of Bristol)	915 – Agreed. See comment 906.
6-916	A	35	17	35	19	The sentence is not clear. Perhaps make 2 sentences out of it? (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	916 – Noted. To be rephrased.
6-917	A	35	17			I assume you mean Allen Perry, not Martin Parry. (Richard S.J. Tol, Uni. Hamburg)	917 – Noted.
6-918	A	35	21	35	23	These two sentences are not clear. (Maarten Bavinck, University of Amsterdam)	918 – Noted. To be rephrased.
6-919	A	35	23			An hint, which major segement could be affected would make the conclusion more understandable. (Wilhelm Windhorst, Kiel University)	919 – Agreed. See comment 906.
6-920	A	35	32	35	36	The references cited date from past 6 years. Are there other more recent studies? Besides, the 2 cited references are American. A global reference would be more useful for the readers. How is "climate sensitivity of recreation visits" defined?	920 – Noted. See comment 906. Will include more recent references.

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						Please give examples. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	
6-921	A	35	38	35	41	useful report, not particularly well included. (Sarah Cornell, University of Bristol)	921 – Agreed. Report to be revisited.
6-922	A	35	38	35	41	The paragraph is very vague. Which regions would loose the "good tourism conditions"? What is defined as a good or bad condition? (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	922 – Agreed. See comment 921.
6-923	A	35	38	35	38	What is GHG ? (Morten Pejrup, Institute of Geography University of Copenhagen)	923 – Corrected.
6-924	A	35	38	35	30	Probably true. But new beaches might emerge because the sediment eroded in some places will deposit in other places (Morten Pejrup, Institute of Geography University of Copenhagen)	924 – Rejected. Minor point only.
6-925	A	35	38	35	41	It is not obvious how concentrations of GHG result in patterns of winners and losers in tourism. (Denise Reed, University of New Orleans)	925 – Agreed. See comment 921.
6-926	A	35	40			"get" rather than "getting" (Donald Boesch, University of Maryland Center for Environmental Science)	926 – Corrected.
6-927	A	35	41	35	41	Viner and Amelung, 2005 does not appear in References. (Bhawan Singh, Université de Montréal)	927 – Noted. Reference to be checked.
6-928	A	35	43			Is this really an extreme event? This perhaps needs defining as extreme events should be consistent throughout the IPCC report and be clearly defined. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	928 – Agreed. To be rephrased “Recent specific climate events…”
6-929	A	35	43			coral bleaching will alter the tourism destinations only for the dedicated scuba diver, but there is unlikely to be any decrease in dive tourism. There is likely to be a continuation of the massive growth in dive tourism and the divers will always be looking for somewhere to go. Many will suffer from ‘presentism’ and have no experience of pre-bleached reef conditions, thus will enjoy the experience of diving on a ‘coral’ reef even if coral populations are decreased. Experience in the Maldives after the 1998 massive bleaching was that most tourists were unaware that the corals were dead and were more interested in the fishes. So the message is clear for tourism operators – protect fish stocks. (Clive Wilkinson, Global Coral Reef Monitoring Network)	929 – Noted. See comment 906.
6-930	A	35	44	35	47	Remove sentence "Within increasing…Todd,2003). (Maarten Bavinck, University of Amsterdam)	930 – Agreed - deleted.
6-931	A	35	44	35	47	See comment no. 4 (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	931 – Unable to response to comment listed as no. 4.
6-932	A	35	47	35	47	Is it absolutely unnecessary to cite the name of the hotel (El Nido Resort) in the	932 – NA. See comment 930.

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						IPCC Resort. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	
6-933	A	35	47	35	48	The example of El Nino influence should not be used everywhere. (Stanislav Ogorodov, Lomonosov Moscow State University)	933 – NA. See comment 930.
6-934	A	35	48			Does this mean from 80% to 10% of guests? (Donald Boesch, University of Maryland Center for Environmental Science)	934 – NA. See comment 930.
6-935	A	35	48	35	50	80% to 10% of what? Total holidaymakers? And acidification gets a mention here - so really should be highlighted in earlier sections! (Sarah Cornell, University of Bristol)	935 – NA. See comment 930.
6-936	A	36	0			6.4.3 nicely written but long and repetitive (Richard Beamish, Pacific Biological Station)	936 – Noted. To be rewritten. See also comment 906.
6-937	A	36	0			If available, the UNEP report on "Global Assessment of Coastal Vulnerability" should be mentioned. (Yves Henocque, Department of Fisheries)	937 – Noted. Reference to be checked.
6-938	A	36	0	37		It is good to see an explict acknowledgment of the variability of natural adaptive capacity (resilience) of different coastal systems. Is it worth making the point later on that work on understanding these natural adaptive capacities should help us develop better management tools for other environments and for similar systems that have been 'damaged' already by human activity? (Heather Viles, University of Oxford)	938 – Agreed. See comment 906.
6-939	A	36	1			The costs to deal with repairs and maintenance should also be factored into the costs. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	939 – Agreed. See comment 906.
6-940	A	36	6	38	5	Good content here, but the text hops a bit among the three components of vulnerability. Clearer structuring would make the impact-messages stand out better. (Sarah Cornell, University of Bristol)	accept
6-941	A	36	9		47	I suspect mangrove should be included with seagrasses and coral reefs, and many people use resources from this ecological zone. Glacier fed rivers, and the people who depend on them, will be vulnerable when the glacier finally melts and stops releasing water, such as in the Himalayas, New Guinea, and elsewhere. This listing of vulnerable ecosystems is largely based upon sea level change only, and does not consider heat, CO2, and changes in ecosystem metabolism in the coastal zone. (Gregg Brunskill, Australian Institute of Marine Science)	accept
6-942	A	36	9	38	5	Reduce by 50% (Derek Jackson, University of Ulster)	accept
6-943	A	36	9	38	5	Suggests following revisions to Table 6.4: for line 12, include reference to deltas	accept

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						and estuaries; in line 15, include reference to estuaries; in lines 20 to 21, include references to London and the Thames Estuary, and Venice and the Vencie Laguna; at 22 to 24, reference to ice-bound coasts in the circumpolar Arctic (ACIA Scientific Report) and for lines 24 to 26, references to the UK and Netherlands coast, and the central region of Portugal. (Magdalena Ariadne Kim Muir, Arctic Institute of North America (AINA), and EUCC-Coastal Union)	
6-944	A	36	9	36	47	What is stated here is already stated other places in the text. I might be considered to condense this page or the text other places. (Morten Pejrup, Institute of Geography University of Copenhagen)	accept
6-945	A	36	9			Section 6.4.3. includes some excellent points and really starts to bring together climate change and human activities. (Denise Reed, University of New Orleans)	accept
6-946	A	36	10			No attempt to define these terms (or citation to literature) -- can we presume that such terms come with a general understanding of their meaning? (Loraine McFadden, Middlesex University)	accept
6-947	A	36	16	36	25	Add here that lower socio-economic strata (the poor) are generally more vulnerable, as they frequently inhabit marginal lands (cf World Bank 2001, Attacking poverty). Also see comment 2 above. (Maarten Bavinck, University of Amsterdam)	accept
6-948	A	36	16	36	18	For mitigation, an effort to identify geographic hotspots and more sensitive locations is a priority. (Franklin Schwing, NOAA Fisheries Service)	accept
6-949	A	36	19		26	additions to the list include: kelp beds (more research is needed), dune systems (storm surges destablizing the coast) (Jacqueline Alder, Fisheries Centre, University of British Columbia)	accept
6-950	A	36	19	36	25	I wonder if this list could be compressed into the idea that on sedimentary coasts vulnerability is gearter wheere sediment supply is limited, and on erosional coasts resistivity is the main control? The list seems to include almost everything and thus loses any focus on particular issues. (Denise Reed, University of New Orleans)	accept
6-951	A	36	19		25	The question arises how has human development/changes in the coast increased the vulnerabilities (Wim Salomons, Institute for Environmental Studies. Free University Amsterdam)	accept
6-952	A	36	24			Add : or already in erosion (LENOTRE NICOLE, BRGM (French geological survey))	accept
6-953	A	36	29	36	29	… as the rate of warming…	accept

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						(Bhawan Singh, Université de Montréal)	
6-954	A	36	34			Warrick et al 2005 not listed in the Literature Cited. (Donald Cahoon, Patuxent Wildlife Research Center, Beltsville Lab)	accept
6-955	A	36	34	36	34	Warrick et.al. 2005 not cited in references (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	accept
6-956	A	36	34			ref. not in the list. You may also consult the observationally based multi-parameter picture of Mörner (2000; ICZM, Spring, 17–20). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	accept
6-957	A	36	34	36	34	Warrick et al, 2005 does not appear in References (Bhawan Singh, Université de Montréal)	accept
6-958	A	36	38	36	41	Although adaptive capacities of human society may be difficult to predict (but see my comment 1 above), a lot of research has been done e.g. on adaptive capacities with regard to the Sahel crisis in West Africa, that is extended to predict reactions to climate change. I can provide literature references if necessary. (Maarten Bavinck, University of Amsterdam)	accept
6-959	A	36	39			This statement is true, but only part of the picture, as the most complex systems to understand which are not discussed here (and need to be) are the potential for adaptation of natural ecosystems/or functioning ecosystems within human-influenced settings, of which most of the more sensitive systems outlined above are. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	accept
6-960	A	36	41	36	47	All these points have already been mentioned. (Maarten Bavinck, University of Amsterdam)	accept
6-961	A	36	43			salt water intrusion into freshwater wetlands behind mangroves and dune systesm contaminating importance sources of drinking water. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	accept
6-962	A	36	44	36	45	increased storm surge also come from intensified tropic cyclones (Daidu Fan, Tongji University)	accept
6-963	A	36	50	36	50	Uncertainties instead of vagaries? (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	accept
6-964	A	37	1			Consideration of vulnerability and adaptive capacity needs also to distinguish between the probability of extreme/catastrophic events and the chronic impacts of an increase in average water level. In Venice, measures are required for both a flood protection system against extreme high tides as well as routine protection of the city from the degradation (physical, economic and social) caused by tides, waves and saltwater infiltration. This is described in several chapters in Fletcher C.	accept

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						and Spencer T. (2005) (Eds) Flooding and Environmental Challenges for Venice and its Lagoon: State of Knowledge, Cambridge University Press (Pierpaolo Campostrini, CORILA)	
6-965	A	37	1	37	4	See comment no. 4 (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	accept
6-966	A	37	1		7	All under the assumption that the models work – contrary to field observations. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	WG1 issue
6-967	A	37	10	37	26	This table is incomplete. I would suggest adding 1) that poor countries are more vulnerable than rich ones, and 2) that the lower socio-economic strata are more vulnerable than richer strata. (Maarten Bavinck, University of Amsterdam)	accept
6-968	A	37	10	37	27	Table 6.4: topic 5 could be shortened. A talbe should contain topics, and no long sentences. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	accept
6-969	A	37	10	37	27	Table 6.4: topic 4 is too long. Venice could be an example for the Mediterranean. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	accept
6-970	A	37	10	37	27	Table 6.4: put topics 1 and 3 together. They are overlapping subjects. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	accept
6-971	A	37	10			Tab 6.4 should also mention, perhaps, that adaptation scenarios for some coastal areas includes relocation of the human settlement, agricultural activities etc. whereas other coastal areas e.g. Venice with its unique and precious cultural heritage need to be protected as it is, and where it is. (Jane da Mosto, CORILA)	accept
6-972	A	37	10			Table 6.4 is a mix of sentences and sentence fragments. Reconcile method of presentation (Victor Kennedy, University of Maryland Center for Environmental Science)	accept
6-973	A	37	10			Table 6.4 The distinctions between the first three bullet points are not clear i.e. point one highlights constraints -- are these different to the cost-benefit ratio (cost constraints) mentioned in bullet point two? (Loraine McFadden, Middlesex University)	accept
6-974	A	37	10			Hazard prone areas needs to be added. Nothing about combined risks of SSTs and other things like hazards or ecological shifts (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	accept
6-975	A	37	10			Table 6.4 is an excellent summary of key vulnerabilities. (Peter Saenger, Southern Cross University)	accept
6-976	A	37	20	36	20	Insert 'Bangladesh' after Gulf of Thailand (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone	accept

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						Management)	
6-977	A	37	24		26	add : moreover climate change may shift extreme event such as cyclones to other zones (LENOTRE NICOLE, BRGM (French geological survey))	accept
6-978	A	37	26			Add Louisiana and the U.S. Gulf Coast (Vivien Gornitz, Columbia University and Goddard Institute for Space Studies)	accept
6-979	A	37	29		31	Add this point to the executive summary. Important! (Susanne Moser, National Center for Atmospheric Research)	accept
6-980	A	37	29			Duplication with adaption chapter? (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	accept
6-981	A	37	29		37	Classical approach and solution: higher GDP higher adaptivity and willingness for resettlement. Is this really the case ?? Please look at all the case studies on seafront housing, New Orleans, current housing developments in low lying areas in Europe.Please refer also to chapter 17. (Wim Salomons, Institute for Environmental Studies. Free University Amsterdam)	accept
6-982	A	37	31			At the end of the sentence on adaptive capacity, you may want to add that actually realized adaptation is dependent on many more factors (Susanne Moser, National Center for Atmospheric Research)	accept
6-983	A	37	34	37	37	See comment no. 4 (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	
6-984	A	37	37			Could cite Yohe's work on adaptive and mitigative capacity here (Susanne Moser, National Center for Atmospheric Research)	accept
6-985	A	37	39	37	45	the paragraph is not clear. There is a comment about results being consistent to other studies, but no example is cited. The only reference is (Hitz and Smith 2004). It would also be helpful to cite concrete examples. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	accept
6-986	A	37	39			The Sun is not included. This is a serious mistake. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	WG1 issue
6-987	A	37	39		45	I don't understand why this paragraph is here. Seems to be a bit out of place. However, it is the one and ONLY instance in this chapter where you indicate level of confidence. Keep doing that throughout the chapter more consistently! (Susanne Moser, National Center for Atmospheric Research)	accept
6-988	A	37	47	37	49	The IPCC correctly has stated on numerous occassions that the defintion of dangerous climate change is a political, not technical question. Therefore a statement such as "the 750 ppm level (of CO2) cannot avoid rapid or dangerous climate change …" is completely inappropriate for an IPCC report. This sentence should be deleted and replaced, if needed, with a description of the types of impacts	accept

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						and the speed with which they might occur at various levels of CO2. (Lenny Bernstein, IPIECA)	
6-989	A	37	47	38	1	Does this statement refer to the effects of climate change in general or specifically to coastal systems? In any case, it requires a reference. (Donald Boesch, University of Maryland Center for Environmental Science)	accept
6-990	A	37	47	38	5	Comments on paragraph. [1] What is the basis for the first sentence? How are "dangerous" and "rapid" defined in this para? Where is the analysis that backs this up, and has that been evaluated? [The reference [Parry (2005)] is not furnished so I cannot review it at this time.] . [2] Substitute the following for the last sentence of the para (starting on p. 38, line 3) : "Goklany (2005a), drawing upon results of the "Fast Track" assessment (FTA) reported in a special issue of Global Environmental Change: Part A 14(1): 1-99 (2004), examined various measures of human and environmental well-being for different SRES scenarios out to 2085 for the former and 2100 for the latter. His results indicate that considering the effects of both climate change and non-climate change factors, through much of this century human well-being is likely to be highest in the richest-but-warmest (A1FI) world and lower in poorer-but-cooler worlds. With respect to environmental well-being, matters may be best under the A1F1 world for some critical environmental indicators but not necessarily for others. A2 is the least desirable for both human and environmental well-being. Specifically with respect to coastal flooding, considering both CC and non-CC factors through 2085, B1 has the least population at risk (PAR) of coastal flooding followed by A1FI, B2 and A2, in that order, but if only the additional PAR due to climate change is considered the order -- lowest PAR to highest -- is A1FI, B1, B2 and A2." NOTE: References not provided within the comment are provided at the end. (Indur Goklany, Office of Policy Analysis, Department of the Interior)	accept
6-991	A	37	47	37	49	How do CO2 levels avoid anything? (Victor Kennedy, University of Maryland Center for Environmental Science)	accept
6-992	A	37	49			That sentence (that 400 ppm level avoids the dangerous effects on society as a whole" seems a rather strong claim, and if anything needs to be supported with a reference. I think, more fundamentally, this should be much more carefully stated. We don't KNOW whether 400ppm will avoid "dangerous interference with the climate system", and certainly, as some parts of society (e.g., Arctic peoples) are already heavily impacted, this is hard to defend ethically or factually. (Susanne Moser, National Center for Atmospheric Research)	accept
6-993	A	38	1		5	This paragraph should have some discussion on how reaching 400ppm might very well increase vulnerability in other ways (i.e., because some resources may be	accept

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						unavailable for development or disaster aid, etc.; see discussion in Chapter 18, and refer to it). (Susanne Moser, National Center for Atmospheric Research)	
6-994	A	38	1	38	1	Parry et al, 2005 does not appear in References (Bhawan Singh, Université de Montréal)	accept
6-995	A	38	8	39	7	This section is concerned with sea level rise, and ignores costs and benefits of other climate change stresses, such as heat, CO2 effects, coastal forests, agriculture, aquiculture, coastal ocean circulation, changes in plant and animal metabolism, disease, and water supply. Where possible, give some real $ data for the examples and citations stated. (Gregg Brunskill, Australian Institute of Marine Science)	Where the literature allows, additional cost and other information such as that requested will be included, along with cross reference to ecosystems and other relevant chapters
6-996	A	38	8	42		Section 6.5 could be shortened. Section 6.5.2 has some examples from prior to 1999 and there is some overlap with the introduction to Section 6.5.3. (Donald Cahoon, Patuxent Wildlife Research Center, Beltsville Lab)	Noted – requested actions will be taken
6-997	A	38	8			In this section, all of the mitigation is re. sea level rise, without mention of other direct or indirect (e.g. storm surge) consequences of climate change (cf. p. 48, line 2ff., p. 50, lines 3-5). (Franklin Schwing, NOAA Fisheries Service)	See response to 995
6-998	A	38	10	39	7	This section focuses wholly on economic analysis, and disregards social analysis. One good introduction to social analysis is found in Visser, L. (ed) 2004 Challenging coasts. Amsterdam University Press. (Maarten Bavinck, University of Amsterdam)	Noted, and action will be taken – reference appreciated
6-999	A	38	10			Section 6.5.1 seems to describe a fairly limited set of tools. The authors should be sure to review the entire spectrum of work. It is possible that there are few good tools but if so others should be described and their limitations made known. (Denise Reed, University of New Orleans)	Only tools of specific and direct relevance to coastal and low lying areas can be discussed in Ch 6; other AR4 chapters will review other tools, of either specific or general relevance, as appropriate; more tools will be discussed here, as space allows
6-1000	A	38	10	42		The 6.5.1 section on "Methods and tools" deals with sea level rise whereas the following sections deal primarily with extreme events like storms etc. This is inconsistent: are there no "Methods and tools" to deal with extreme events ? Please leave out in the text the reference to the tsunami, this had nothing to do with climate change. Replace tsunami with New Orleans which is more relevant. (Wim Salomons, Institute for Environmental Studies. Free University Amsterdam)	More attention will be given to tools that deal with extreme events, to the extent they are available; reference to tsunami will be replaced by Hurricane Katrina – it had not happened when FOD was prepared.
6-1001	A	38	12	38	50	This may be a definitional issue (as none of terms are defined) but this section seems to inappropriate limit "costs" to direct costs and total economic costs of climate change. Based on the absence of definitions and brief materials, it does not	Very pertinent and helpful comments; terms are defined elsewhere in the WG II report.

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						appear that social, environmental and ecosystem costs have been estimated fully. It is also important to note different assumptions and regulatory frameworks with impose different costs with respect to environment and human health. For example, parties in the US may not fully take into account ecosystem and environmental costs, given the national and state regulatory framework.Similarly, in the absence of an ununiversal health and welfare region, climatic impacts may be disproportionately bourne by individuals within the society, versus the entire society (see fallout of Hurricane Katrina for how burden of what may be climatically augmented storms are borne by individuals and particularly poorer minorities within tge Louisana and Gulf states). In contrast, the European directives and policy frameworks impose obligations to cost out, and to improve and maintain ecosystem health (i.e., Water Framework Directive which has obligations for estuaries and coasts). Moreover, due to differing approaches to health cared and social benefits, the health and economic impacts of climate change may be more fully borne by the state, as opposed to individuals. In addition to these points, I would suggest that it is very important to define what is a "cost", and to refer to and economically evaluate the range of services provided by ecosystems. Arguably need to explicitly include ecological, environmental, and social costings in this analysis. (Magdalena Ariadne Kim Muir, Arctic Institute of North America (AINA), and EUCC-Coastal Union)	
6-1002	A	38	14			Have all direct economic cost studies been about SLR only? There may be more references. This section is very weak on socio-economic consequences and non-modelled assessmetns of impacts such as those by Few, Bray, Tompkins, Turner (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Noted, and action will be taken – references appreciated
6-1003	A	38	15		19	Very classical approach. Climate change is only sealevel rise, where are the extreme events and climate change (Wim Salomons, Institute for Environmental Studies. Free University Amsterdam)	These statements are literature based; a broader approach will be taken.
6-1004	A	38	20		23	Could include the losses in fisheries and aquaculture production (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Noted, and action will be taken
6-1005	A	38	20	38	27	See comment no. 4. The sentences in the whole paragraph are too long. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken
6-1006	A	38	25	38	25	Abbreviation: FUND = ? (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken
6-1007	A	38	29	38	31	See comment no. 4. Do not use etc in scientific and/or official reports. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken
6-1008	A	38	29	28	31	"land prices may rise if land is lost, food prices may rise if agriculutral land gets	The use of “may” was intended to indicate

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						scares, etc." the situation can occur in small countries but not in large ones. This is also mentioned in somewhere in the text (Daidu Fan, Tongji University)	that exceptions do occur.
6-1009	A	38	30	38	30	Reformulate as land prices may 'change (both rise and fall)' if land is lost. Land price usually fall in areas subject to erosion (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	Noted, and action will be taken
6-1010	A	38	31	38	31	AN appropriate way - computable general equilibrium models are not a complete panacea for the problem of true economic impacts… admittedly I don't have references to hand of the application of other econometric approaches to future sea-level rise impacts, but just because CGEs are widely used, doesn't mean that some users aren't wary of them. How does society really respond to changing market forces? yes, static and direct costs are likely to be too small, but but but... (Sarah Cornell, University of Bristol)	Noted, and action will be taken
6-1011	A	38	31			There are economists (not to mention non-economists) who would argue that general equilibrium models are not an "appropriate" way to assess these costs, as most of the costs may be incurred during out-of-equilibrium stages of a system (e.g., Hanemann); This paragraph should be stated more carefully and critically of economic models. See also the discussion in Moser, Susanne. 2005. Climate Scenarios and Projections: The Known, the Unknown, and the Unknowable As Applied to California. Synthesis Report of a workshop held at the Aspen Global Change Institute, 11-14 March 2004 in Aspen, Colorado, AGCI: Aspen, CO (in press) (Susanne Moser, National Center for Atmospheric Research)	Noted, and action will be taken – reference appreciated
6-1012	A	38	39			This needs a reference. (Susanne Moser, National Center for Atmospheric Research)	Noted, and action will be taken
6-1013	A	38	41	39	7	The paragraphs are not clear. There could be concrete examples or model results showing the costs of adaptation, for instance. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken re clarity; Figure 6.4 in part addresses request for concrete examples, and more will be added.
6-1014	A	38	47	38	50	Can be deleted; well explained in previous sentences (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	The added details would seem useful, but consideration will be given to deleting the noted text
6-1015	A	39	3			After "misleading conclusions" add a sentence on why? (Susanne Moser, National Center for Atmospheric Research)	Noted, and action will be taken
6-1016	A	39	5	39	5	analysis and considered… (Bhawan Singh, Université de Montréal)	Noted, and action will be taken
6-1017	A	39	5			add "and" between "analysis" and "considered"	See above

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						(Richard S.J. Tol, Uni. Hamburg)	
6-1018	A	39	6	42		A small point. The focus of this chapter is quantifying increases in societal vulnerability as a result of climate change -- it doesn't attempt to address all dimensions of societal vulnerability in coastal zones. This point is clear in the subsection title, but not in these sentences. (Loraine McFadden, Middlesex University)	Noted, and action will be taken
6-1019	A	39	7			At the end here, you should conclude with a recognition of the limitations of economic models and approaches, and the many unknowns in doing economic assessments. Also recognize that economic impact studies have not been done with equal attention for all impacts: what has not yet been costed out/examined (e.g., far less attention on beach nourishment, salinization of aquifers, impacts on ag). (Susanne Moser, National Center for Atmospheric Research)	Noted, and action will be taken, as the literature allows
6-1020	A	39	10	44		Comment on paragraphs, section 6.5.2: Lines 25-32 on p 40 and 46 (p 40) to 4 (p 41) are examples of pseudoparagraphs that crop up in various places, consisting of lists of diverse observations related only by a general background topic. These should be transformed into either real paragraphs by adding integrative text, or into genuine lists with brief topical heading sentences. (Robert Buddemeier, University of Kansas)	Noted, and action will be taken
6-1021	A	39	10	40	44	In addition to tropical cyclones, it would be useful to have a greater focus on hurricanes. By this time, there should be analysis, models and observations arising from recent hurricanes in the Gulf of Mexico, such as Hurricane Katrina, whose intensity may have increased due to warmer sea surface temperatures and climatic changes. (Magdalena Ariadne Kim Muir, Arctic Institute of North America (AINA), and EUCC-Coastal Union)	"Tropical cyclones" includes "hurricanes"; the chapter will be updated to capture recent events
6-1022	A	39	10			IBID (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	See response to 1002
6-1023	A	39	10	41	4	Reduce to within 1 pages (Qilun Yan, National Marine Environmental Monitoring Center)	Other reviewers are requesting additional information – every effort will be made to tighten language and hence reduce size of this section
6-1024	A	39	12		16	See above. Some reference to actual estimates of severe weather-related costs from e.g. Munich Re would be helpful. (Anthony Clayton, University of the West Indies)	Noted, and action will be taken
6-1025	A	39	12	41	4	This section could be structured more clearly into regions (paragraph by paragraph) or hazard type - flood, erosion, storm damage. Lots of good data and recent assessments, but tangled structure	Noted, and action will be taken

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						(Sarah Cornell, University of Bristol)	
6-1026	A	39	12	39	13	Data from EM-DAT (the OFDA/CRED International Disaster Database) does not support this statement with respect to deaths from exterme events. Specifically, the average deaths per year from climate and weather related events (i.e., drought, extreme temperature, famine, flood, slides, wave/surge; wild fires, wind storm) declined by over 95 percent between the 1930s and 2000-2003, while death rates declined overall by 98.5 percent [Goklany 2005c, based on EM-DAT, the OFDA/CRED database; this database probably missed a number of events in the early years, which suggests an even stronger downward trend]. If famines are excluded then both deaths and death rates peaked during the 1920s [Goklany, personal communication]. Similarly, long term data from the United States on cumulative deaths and death rates due to hurricanes, floods, lightning and tornados show that they peaked in the 1970s, and have since declined by over 50 percent for deaths and 64 percent for death rates [Goklany 2000 and personal communication]. With respect to property loss, data for the US indicates that, indeed losses have increased for floods and hurricanes but because there is now more property at risk (because the population has increased and it wealthier). If the increases in property at risk is accounted for, there is no significant trend for either hurricanes or floods. [I am not aware of property loss studies for other types of events]. References: [1] Goklany (2000, 2003), [2] R.A. Pielke, Jr. and C.W. Landsea, "Normalized hurricane damage in the United States: 1925-1995," Weather and Forecasting 13: 621-631 (1998), [3] Mary W. Downton, J. Zoe Barnard Miller, and Roger A. Pielke Jr. 2005 Reanalysis of U.S. National Weather Service Flood Loss Database. Natural Hazards Review. February 2005: 13-22. (Indur Goklany, Office of Policy Analysis, Department of the Interior)	The revised text will need to highlight the different interpretations of trends – e.g. Munich Re vs EM-DAT based studies; references appreciated
6-1027	A	39	12	41	4	Reduce by 50% (Derek Jackson, University of Ulster)	Other reviewers are requesting additional information – every effort will be made to tighten language and hence reduce size of this section
6-1028	A	39	15	39	16	There is repetition of the hazards in the sentence. They have already been addressed in the text. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Repetition will be avoided
6-1029	A	39	18	39	32	Add here the vulnerability of the poor (see comment 2 above). (Maarten Bavinck, University of Amsterdam)	Noted, and action will be taken
6-1030	A	39	18	39	32	The Benfield Hazard research centre has material that may be relevant. This paragraph is odd to read - jumps around a bit, and has a funny selection of	Noted, and action will be taken – references appreciated

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						sadnesses, which don't coherently add up to the less tangible costs of coastal disasters. There must be some more current literature on this. The UK Environment agency's new social policy unit have done some research on environmental justice that I think has some relevance. (Sarah Cornell, University of Bristol)	
6-1031	A	39	18		32	Paragraph does not adequately mention mental health impacts (higher propensity for suicide, spousal and child abuse after disaster), and things like higher propensity for bancrupcy. It's widely discussed currently in the US after the hurricanes in the Gulf region (and recent changes in US bancruptcy laws). (Susanne Moser, National Center for Atmospheric Research)	Noted, and action will be taken
6-1032	A	39	18	39	32	I agree. Some major cities never gained momentum back after a natural disaster. E.g. galvestone Texas, will New Orleans gain momentum again or will it die back ? (Morten Pejrup, Institute of Geography University of Copenhagen)	Noted
6-1033	A	39	34	39	40	Baxter (2005) provides some assessment of post-flood morbidity and mortality after the North Sea flood of 1953 (Thomas SPENCER, Cambridge University)	Noted, and action will be taken – reference appreciated
6-1034	A	39	42		50	There are some recent papers in Science and Nature about the increase in high energy hurricanes and cyclones, and the increase in cost due to increased technology & population at the coastal zone. (Gregg Brunskill, Australian Institute of Marine Science)	
6-1035	A	39	45			Add a new sentence after the period as follows: "This however, was less than the number killed in the previous twenty years. In 1970 alone, a single cyclone killed 300, 000 in Bangladesh (EM-DAT 2005)." (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted, and action will be taken – we have the relevant literature
6-1036	A	40	1	40	23	should take hurricae Katrina as an example in developed countries to illustrate public awareness and emergency handling capacity should be greatly improved to lower large losses of life and property. (Daidu Fan, Tongji University)	Noted, and action will be taken – Katrina occurred after ZOD was written
6-1037	A	40	3	40	3	Abbreviation: GDP = global development patterns? Please explain. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	GDP – gross domestic product (will be defined in text)
6-1038	A	40	5	40	7	Earthquakes and tsunamis are not caused by climate change (Morten Pejrup, Institute of Geography University of Copenhagen)	We of course realise this, but the analysis includes them – we believe the lesson to be learned is still valid
6-1039	A	40	9	40	44	This would be an excellent place to add some information and statistics about the impacts of Hurricane Katrina and other hurricanes striking during the unusally active 2005 season in the tropical Atlantic.	Noted, and action will be taken – Katrina etc occurred after ZOD was written

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						(Donald Boesch, University of Maryland Center for Environmental Science)	
6-1040	A	40	9	40	23	The information in this paragraph could be put in a table, or in a graphic, preceeded by a short introduction. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Thank you for the suggestion – we will likely tape it up
6-1041	A	40	18		23	Seems like a perfect place to highlight impacts of Hurricane katrina on New Orleans (Susanne Moser, National Center for Atmospheric Research)	Noted, and action will be taken – Katrina etc occurred after ZOD was written
6-1042	A	40	34		36	I have seen press statements that the USA will spend $200 billion to rebuild just New Orleans, not including the rest of the coastal damage. This seem futile, and ICPP might suggest that the city should be moved landward. (Gregg Brunskill, Australian Institute of Marine Science)	Noted, and action will be taken – but IPCC must be policy neutral, not prescriptive
6-1043	A	40	34		44	See above. This will need to be updated to take account of the impact on New Orleans and the Gulf States. (Anthony Clayton, University of the West Indies)	Noted, and action will be taken
6-1044	A	40	34	40	45	This para should note that from 1925 to 2004, US property losses due to hurricanes, as measured by percent of property at risk don't show upward trends. On the other hand, property losses in real dollars have increased, indicating that socio-economic factors -- growth in population and wealth -- are could be just as important determinants for such losses as are climatic factors [Goklany (2000) looked at 1925 to 1997 and updated it to 2004, Pielke and Landsea (1998) looked at 1925 to 1995.] (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted, and action will be taken
6-1045	A	40	34		39	Update this to 2005 and include effects of Hurricanes Katrina and Rita. (Vivien Gornitz, Columbia University and Goddard Institute for Space Studies)	Noted, and action will be taken
6-1046	A	40	46			REWRITE opening sentence to improve clarity: A key problem for Venice, Italy, is the increasing frequency of floods due to increased relative sea level in the past century of about 23 cm, consisting of about 12 cm of land subsidence, both natural (3 cm) and anthropogenic (9 cm), and 11 cm of sea-leve rise (Carbognin, Teatini, Tosi , Journal of Marine Systems 51, 2004,pp. 345-352). The anthropogenic subsidence was caused by groundwater withdrawals, which began in 1930 and became significant between 1950 and 1970 when it was stopped. The subsidence of the city of Venice is presently limited to about 0,4 mm/yr. The overall rate of sea-level trend between 1896 and 2002 is 2.50 mm/yr and includes all the effects. It must be noticed that the time series of yearly mean sea level presents wide oscillations and a cospicous increase during the last decade, especially considering the values recordered in 2001 and 2002. Significant and consistent evidence of sea level rise over previous centuries is also found by analysis of longer term data sets (Camuffo e Sturaro, 2004).	Noted, and action will be taken

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						(Pierpaolo Campostrini, CORILA)	
6-1047	A	40	46		48	with a totally changed trend from ~1970 when the rise stopped! (see Mörner, 2005; Rep. House of Lords). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Noted, and action will be taken – reference appreciated
6-1048	A	40	46	41	4	It is interesting to note the shared and high vulnerability of lagunas, estuaries, deltas and arctic coasts to sea level rise, as well as storm surges and other extreme weather events. Arctic vulnerability is discussed very fully in the Arctic Climate Impact Assessment Scientific Report. This issues is also discussed further in my overall comments, but I would suggest that very useful to consider lagunas, estuaries and deltas in conjunction with coasts, as all linked to the sea, and shared physical, economic and social characteristics, and impacts and responses to climate change. For example, the discussion of Venice and overall impacts on the Venetian laguna needs to be expanded. Venice and the Venetian laguna, of which the city is one integral part, are vulnerable to both extreme weather events and "normal" flooding, which now occurs up to 10 times in one year. Due to the subsidence of the laguna (human induced and geological), as well as overall subsidence in the Adriatic Sea, Venice and the Venetian laguna are also vulnerable to even a 10 centimetre increase in sea level, and will be dramatically affected by a large increase in sea level. One measure of the actual adaptive or preventative costs may be required to protect Venice and the overall laguna is the 5.2 billion euro projected cost of the MOSES project, which is a dike structure designed to be used to prevent tidal surges from entering the laguna. Given the sensitivity of Venice and the overall laguna to climate change, they could also be considered as models and indicators for global impacts of climate change for lagunas and coasts. Equally, London and the Thames Estuary are very vulnerable to sea level rise, tidals surges, flooding in the upstream tributaries of the Thames Rivers, and heavy rainfalls. All these factors and potential negative impacts have been aggravated by increased building in the flood plain, antiquated sewage and storm water drainage systems, and increased built environment decreasing the absorption of rainfall. In its period of operation, the Thames Flood Barrier has been used to ameliorate the impacts of upstream flooding as well as tidal surges. An extensive study is now occurring under the Thames 2100 initiative to determine additional flood and tidal surge defence mechanisms that will be needed in the near future to address climatic augmented sea level rise and extreme weather events, where these costs can also be considered adaptive or preventative costs. (Magdalena Ariadne Kim Muir, Arctic Institute of North America (AINA), and EUCC-Coastal Union)	Noted, and action will be taken

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6-1049	A	40	46	40	48	It is difficult to reduce the 'enice problem' to three lines. Th etxt reads as if the increased frequency of storm surges is due to sea level rise alone but this is a much more complex issue - as the comparison of the tidegauge records at Venice and Trieste show. There is overlap here with chapter 1 (where the treatment is better) (Thomas SPENCER, Cambridge University)	Noted, and action will be taken
6-1050	A	40	49	40	49	Please use SI units. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken
6-1051	A	40	49			presumably ft / yr units will be replaced (Thomas SPENCER, Cambridge University)	Noted, and action will be taken
6-1052	A	41	1	41	4	See comment no. 4 (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken
6-1053	A	41	7			What about variability as well as change? (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Climate change includes changes in variability (including extreme events) as well as trends
6-1054	A	41	9	41	12	are we sure we know more about the economic costs and benefits of climate change than the social and cultural consequences? Isn't this just an economist-oriented opinion? The opener to section 6.6.2 puts the same info in a less contentious way (Sarah Cornell, University of Bristol)	Will revise, to note that recently there has been substantial progress
6-1055	A	41	9	41	12	See comment no. 4. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken
6-1056	A	41	9		12	Please see comment number 4. (Luciana das Neves, Hydraulics and Water Resources Institute | Faculty of Engineer, University of Porto)	Comment 4 - I would also include Europe, some examples can be found in the EUrosion Study (www.eurosion.org) Noted, and action will be taken
6-1057	A	41	9	41	25	To this paragraph should be added the expansion of areas suitable for aquaculture in coastal waters. No areas would be lost, but species might change. Also, some tropical producers would face competition from some cooler countries such as the USA (a major market) where shrimp culture is only marginally possible, due to temperature. (John Everett, Ocean Associates,Inc.)	Such points will be added, where the literature and space allows
6-1058	A	41	9	43	12	With disagree with statement (p41, ll 11-12) that little progress made on evaluating non-monetary costs and social and cultural consequences, as whole body of literature out there in environment and natural resource evaluation, as well as environmental and socio-economic impact assessment, that is applicable to climatic impacts. At ll 12 to 13, comment that most costs are extreme weather events. However, depending on the vulnerability of the region, more normal events can also be problematic. For example, given sensitivity, Venice and its laguna can be affected by routine storms. This summer as well and over past two to three years,	Will revise, to note that recently there has been substantial progress; while other situations impose costs (economic and other), in most cases the literature indicates that extreme events impose the greatest costs. Figure 6.4 shows how costs are distributed between developing and developed countries, at least for SLR.

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						Spain and Portugal were seriously affected by changes in seasonal rain patterns and drought. In response to benefits of, and costs associated with climate change, it appears to me that there are very limited benefits in the coastal zones mnationally, regionallly or globally. Even the polar regions will experience significantand on balance negative impacts, despite potential benefits (see ACIA Scientific Report). While both developing and developed countries will experience these impacts and costs; developing countries and economies may not be as able to assist with ameliorating the negative impacts. Hoewever, if look at economic impacts of Hurricane Katrina, as well as insurance assessments for more routine minore climate impacts like flooding, even developed economies or directly impacted parties within these societies, will have problems with bearing these costs. (Magdalena Ariadne Kim Muir, Arctic Institute of North America (AINA), and EUCC-Coastal Union)	
6-1059	A	41	13	41	15	The sentence "These costs …" is not clear. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	The chapter devotes considerable space to the evidence for exacerbated costs (economic and other) due to climate change.
6-1060	A	41	15	41	17	This strong statement is made without much evidence or analysis. (Donald Boesch, University of Maryland Center for Environmental Science)	Noted, and action will be taken
6-1061	A	41	15	41	17	The sentence has been repeated too many times in the text. "The impacts of such changes…" (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken
6-1062	A	41	15		17	This sentence should be qualified more carefully. I just don't buy it like this. Developed and developing countries face different impacts -- some with higher human costs, others higher economic costs. So if you could spell this out more carefully, maybe it becomes more acceptable. Goes also for the discussion on p.42, lines 21-25 and associated graphic. This just calls for explanation or finetuning. (Susanne Moser, National Center for Atmospheric Research)	Noted, and action will be taken
6-1063	A	41	15			Sentence there needs a reference (Susanne Moser, National Center for Atmospheric Research)	See comment above
6-1064	A	41	17		18	Not so simple since temperature also affects reproduction, disease, prey availability and parasite infection levels etc. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	The intention is for Ch 5 to spell out the more complex situation
6-1065	A	41	17	41	22	But the higher hydrogen ion concentration (due to lowering pH) will impact efficiency of marine animals, lower aragonite saturation will reduce calcification in shell fish - these may offset these "benefits " of warmer seas! (Carol Turley, Plymouth Marine Laboratory)	Reviewers of the ZOD asked us to describe benefits of climate change, not just focus on the detrimental consequences – hence these statements; we agree that the latter will far outweigh the former

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6-1066	A	41	18		21	Do not need to increase the use of fishing vessels, globally there is an over capcity in the sector! (Jacqueline Alder, Fisheries Centre, University of British Columbia)	The emphasis is on year round use – ie a smaller number of boats can be used with greater efficiency;
6-1067	A	41	20	41	21	Fishing is more constrained by wind than by temperature. There are indications that extra-tropical storminess may go up. Mortality of the homeless is winter-time mortality; summer-time mortality would increase. This is not just in the coastal zone. (Richard S.J. Tol, Uni. Hamburg)	Points taken, but reviewers of the ZOD asked us to describe benefits of climate change, not just focus on the detrimental consequences
6-1068	A	41	22		23	While marine mammals may have a reduced caloric demand other factors need to be considered such as risk to dieseas/parasites, pollution from increased runoff etc., food availability since prey distribution and abundance will change as seen in El Nino years, similarly marine mammals may still need the same since they may move further offshore or to areas where temperatures are more appropriate, also they may need more calories to account for the increase in effort to find prey or to avoid predators. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	The intention is for Ch 5 to spell out the more complex situation
6-1069	A	41	27	41	30	Are there any estimations of how long would it take to this shift in tourist destinations? Is it realistic that North Sea beaches (for example) would replace the Mediterranean Sea beaches in the tourists preferences? (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	These questions are addressed in Ch 7, where more space can be devoted to this topic
6-1070	A	41	27	41	37	Possible duplications from section 6.4.2.6; can be reduced or deleted (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	Noted, and action will be taken
6-1071	A	41	27			Repetition with earlier sections. Reduce in either place. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Noted, and action will be taken
6-1072	A	41	27	41	37	The content of this paragraph was already stated on page 35 (Morten Pejrup, Institute of Geography University of Copenhagen)	Noted, and action will be taken
6-1073	A	41	27	41	37	There is some redundancy with chapter 6.4.2.6 (Klaus Schwarzer, Institute of Geosciences, Coastal and Continental Shelf Research)	Noted, and action will be taken
6-1074	A	41	30	41	37	Here could appear some concrete examples of the study of Bigano et al 2005. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken – reference appreciated
6-1075	A	41	32		33	The sentence calls for a reference -- where are these numebrs from? (Susanne Moser, National Center for Atmospheric Research)	The reference is given – Hamilton et al., 2005
6-1076	A	41	39	41	47	There is repetition in this paragraph about the consequences of sea level rise. It would be easier to simplify and go straight to the costs of climate change effects. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
6-1077	A	41	39			"One of the most certain consequences…" Global sea level rise, yes, but not by how much or when, let alone local differences in sea level rise. (Vivien Gornitz, Columbia University and Goddard Institute for Space Studies)	Noted, and statement will be reworded to make clear where the certainty lies
6-1078	A	41	39	41	47	Section is redundant with other sections in text (Victor Kennedy, University of Maryland Center for Environmental Science)	Noted, and action will be taken
6-1079	A	41	39		40	Not at all. This is not founded in the sea level community, only ion the IPCC modelling community. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Noted, and statement will be reworded to make clear where the certainty lies
6-1080	A	41	39		47	Could be significantly shortened if the repetitive portions were taken out (Susanne Moser, National Center for Atmospheric Research)	Noted, and action will be taken
6-1081	A	41	41			"100 million persons live within one meter of mean sea level" can not be understood. "One meter" is an exact expression or just literature one, considering that high density of mega deltas have always high tidal ranges (Daidu Fan, Tongji University)	This paragraph will likely be deleted, or at least shortened and clarified – see responses above
6-1082	A	41	42			At around 1970, sea level fell in the Maldives (Mörner et al., 2004; Mörner, 2005). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	This paragraph will likely be deleted, or at least shortened and clarified – see responses above
6-1083	A	41	47			May want to consider the need to fund/support ongoing maintenance costs as highlighted in the US-Mississippi delta where levees were not maintained. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Noted, and action will be taken
6-1084	A	42	4			prefererentially > particularly (Richard S.J. Tol, Uni. Hamburg)	Noted, and action will be taken
6-1085	A	42	7	42	13	On Pg. 33, line 49 - Pg 34, line 1, and again on Pg. 38, lines 9-11, the text states: By the 2080s, depending on the SRES scenario adopted, the model calculates that between 2 million and 50 million additional people per year will experience flooding (Nicholls, 2004). This text states: While 10 million people experienced coastal flooding annually in 1990 (I assume that this should be : in the 1990s), by 2100 the number of people flooded could range between 0.4 and 39 million/year (I assume the word "greater" has been omitted), depending on the SRES scenario (Nicholls, 2004). The two statement seem to referring to the same study? Why the difference in the reported results? To further confuse matters, much larger numbers of people at risk are given in the following sentences, up to 510 million people, but no references are provided. (Lenny Bernstein, IPIECA)	The apparent inconsistencies, errors and absence of references will be addressed
6-1086	A	42	7	42	9	Most of this is stated on page 39 line 42-50 (Morten Pejrup, Institute of Geography University of Copenhagen)	See comment above
6-1087	A	42	7	42	25	The different assumptions of sea level rise (55 cm, 96 cm, 50 cm, 100 cm, 65 cm	See comment above; Figure 6.4 will be

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						are a little bit confusing. This looks not very consistent. No reason is given for these different assumptions. In general many things of 6.5.3. are redundant and have been mentioned in the text before. Letters of the text in figure 6.4 are too small !! (Klaus Schwarzer, Institute of Geosciences, Coastal and Continental Shelf Research)	improved
6-1088	A	42	9			The sentence beginning: "Unless adaptive…" needs to be revised. Either remove the word 'not' or replace the word 'Unless' with 'If". (Donald Cahoon, Patuxent Wildlife Research Center, Beltsville Lab)	Noted, and action will be taken
6-1089	A	42	13		14	Do the estimation for all the big cities on the coast, not just Thailand. (Gregg Brunskill, Australian Institute of Marine Science)	The IPCC assessment is literature based – it cannot involve original research; earlier statements deal with the entire coast
6-1090	A	42	26		47	I cannot read the vertical axis labels on the graphs in Fig. 6.4. (Gregg Brunskill, Australian Institute of Marine Science)	Figure 6.4 will be improved
6-1091	A	42	26	42	48	Figure 6.4: This figure is very useful to the this chapter. It could be bigger, and there could be more specific comments on the text above. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Figure 6.4 will be improved; text will be added
6-1092	A	42	26	42	48	Figure 6.4: Costs: The same comment as above: The y-axis scale is different in all 3 graphics. Please verify if the GLOBAL costs in US$ are in "millions", it does not seem so. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Figure 6.4 will be checked and improved
6-1093	A	42	26	42	48	Figure 6.4: Consequences: The y-axis scale is different in all 3 graphics. Please use the same scale (or adopt a log-scale for instance) so that the readers can have a realistic idea of the impacts globally and in developing and developed countries. Please indicate in the legend the units of each parameter so that it will be easy to identify then on the primary or secondary y-axis. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Figure 6.4 will be improved
6-1094	A	42	27	42	48	This table is unclear, also because of the small type. (Maarten Bavinck, University of Amsterdam)	Figure 6.4 will be improved
6-1095	A	42	27		46	legend within figures are not legible (LENOTRE NICOLE, BRGM (French geological survey))	Figure 6.4 will be improved
6-1096	A	42	27	42	48	Figure 6.4 and its legend are too small and are lamely compiled. (Stanislav Ogorodov, Lomonosov Moscow State University)	Figure 6.4 will be improved
6-1097	A	42	27	42	46	Legend is impossible o read. Text on axis is very difficult to read- (Morten Pejrup, Institute of Geography University of Copenhagen)	Figure 6.4 will be improved
6-1098	A	42	27	42	46	Figure 6.4 : difficult to read, quality needs improving. (Bhawan Singh, Université de Montréal)	Figure 6.4 will be improved

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6-1099	A	43	0			The New Orleans flood disaster triggered reflections about cultural differences in adaptation and mitigation between countries like USA and eg the Netherlands, but equally true China. This reviewer finds it important to introduce these notions. I attach an editorial for Journal of Coastal research now in press (Marcel Stive, Delft University of Technology, Faculty of Civil Engineering & Geosciences)	Noted, and action will be taken
6-1100	A	43	1	51		Comment on section 6.6: This undoubtedly reflects my background in the physical sciences, but this section comes off to me as excessively burdened with equivocation, truisms, and observations that don't go much of anywhere in terms of conclusions or recommendations (e.g., p 48, lines 16-20). This may represent the state of the art/science, but I suggest editing down the verbiage and focusing on a more limited suite of issues around which some useful take-home messages can be developed. (Robert Buddemeier, University of Kansas)	Noted, and action will be taken
6-1101	A	43	1	51	21	this section reads really well, overall, and is good and up-to-date (Sarah Cornell, University of Bristol)	Thanks.
6-1102	A	43	1	45	16	The way this section is written, starting with the technical/scientific aspects of coastal engineering and ending with a short section on integrated coastal management has the effect of de-emphasizing ICM. While existing practices to coastal problems may be decidedly responsive and unintegrated, the adaptation to climate change perspective requirsres ICM withinthe perspective of long range community planning. I would recommend trying to put greater emphasis on ICM, perhaps with a more direct discussion of the relative merits of current engineering practices vs ICM, right at the beginning of the section. (Philip Hill, Geological Survey of Canada)	Noted, and action will be taken
6-1103	A	43	1			Need to clearly define adaptation and which facets of it this section focusses on. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Ch 17 is devoted to adaptation; this section is consistent with that; the sub-headings are an attempt to define the focus within the broader topic of adaptation
6-1104	A	43	1	52	30	The whole question of adaption seems to focus on that of human adaption (especially to sea level rise - yet this is onlt one of the impacts) and the costs of this versus the costs of mitigation. However, whether our life support system - the terrestrial and marine biospheres- can adapt and therefore continue to sustain the human population is given no attention. And yet this is the real key to survival as well as adaptation. What is the cost of lack of adaptation of the biosphere or vulnerable parts of it? I should think that this is impossible to cost or the costs would be so high that mitigation becomes a cheap alternative.	Such matters go well beyond the scope of Ch 6, as they are more generic; they are dealt with in Ch 17

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						(Carol Turley, Plymouth Marine Laboratory)	
6-1105	A	43	3	43	12	The initial sentence is not clear. In this paragraph it would be better to describe clearly which themes will be assessed. There are long sentences and too many ",", making it difficult to read. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken
6-1106	A	43	3	43	12	This is the first time in the chapter that an introductory paragraph fronts a section. The paragraph is quite useful, is this something that should be repeated at the beginning of each major section? (Loraine McFadden, Middlesex University)	Noted, but see comment 1105
6-1107	A	43	4			Insert before the period on line 4 as follows: "… and non-climate change related factors." (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted, and action will be taken
6-1108	A	43	4			uhhh, the "enhanced greenhouse effect" - DO NOT USE THIS TERM EVER AGAIN - whoever wrote it. It is heard by lay audiences as "the better kind of greenhouse effect" - it's a GOOD thing, when people hear "enhanced". Just cross it from your vocabulary. Use "continued global warming" or "anthropogenic" (also bad, but better) or "human-caused" or whatever, just not enhanced. (Susanne Moser, National Center for Atmospheric Research)	Noted, and action will be taken
6-1109	A	43	8	43	9	The introduction of the term 'integrated coastal management (ICM)' needs to be explained. This is an important transition from simply using the term 'coastal management' elsewhere in the Chapter to date. The term should be introduced with referenced to ICM texts, like (Kay and Alder 2005), (Cicin-Sain and Knecht 1998), (Clark 1996) etc, or explaination of the concept provided. (Robert Kay, Coastal Zone Management (Australia) Pty Ltd)	Noted, and action will be taken
6-1110	A	43	10			This whole section on options is far too definitive. Each of the statements on options should be couched with statements defining choice and decision uncertainty. For example, the statement: "Given that socio-economic activities and population are highly concentrated in the coastal zone in Asia, protection will predominate". Could better be worded: "Given that socio-economic activities and population are highly concentrated in the coastal zone in Asia, protection is likely to predominate". (Robert Kay, Coastal Zone Management (Australia) Pty Ltd)	Noted, and action will be taken
6-1111	A	43	15	43	18	The title for this section is not clear, as well as the initial sentence. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken
6-1112	A	43	15			Heading makes no sense - sea-level extremes variability and change? (Victor Kennedy, University of Maryland Center for Environmental Science)	Noted, and action will be taken
6-1113	A	43	15	52		Section 6.6 is too long and needs strong editing. The division of the subsections are	Noted, and action will be taken

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						not clear and appear to overlap. No reference is made to chapter 17, which by the way reads much better. Section 6.6 relates adaptation, very broadly speaking, to GDP, to the ability or lack of it of scientist convincing policy makers of science views on policy issues and the presence of data gaps. The social science aspect of adaptation is nearly absent. (Wim Salomons, Institute for Environmental Studies. Free University Amsterdam)	
6-1114	A	43	17		49	This section on Adaptation/issues & challenges does not consider acid sulfate soil, salinization of freshwater wetlands, changes in primary productivity of coastal zone, fisheries, estuarine processes, ecosystem services, and all the food crops and livestock on the coastal plain. (Gregg Brunskill, Australian Institute of Marine Science)	Noted, and action will be taken, as space and the literature allow
6-1115	A	43	17			I see no reference to Okonski "Adapt or Die". (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Noted – material in the reference will be considered for possible inclusion, as space allows
6-1116	A	43	18			Inserty a new sentence after the period as follows: "It should be proactive and consider risks due to both the current climate as well as climate change (Goklany 2000, 2003)." (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted, and action will be taken
6-1117	A	43	25	43	49	There are too many long sentences in this paragraph. It would be easier to the reader to have here a clear, simple listing of the issues related to adaptation to climate change. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken
6-1118	A	43	27			Box 6.3 does not summarize integrated assessment. This box is all about sea level rise and cliff face erosion. (Gregg Brunskill, Australian Institute of Marine Science)	This reference to Box 6.3 should have been deleted from the FOD - apologies
6-1119	A	43	27	43	28	This box only refers to the SCAPE project. Can this specific project be used to reflect all dimensions of recent progress in integrated assessments? (Loraine McFadden, Middlesex University)	See response above
6-1120	A	43	33			Is beach nourishment really an adapation mechanism? Is it sustainable? Should be a more critical evaluation of adaption measures (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	These issues will be given more attention
6-1121	A	43	37			All about 'natural systems' rather than human adaptation - which is equally important - instutitions, governances, individuals. Not enough on this is covered/x-referred to the adaption chapter. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	We disagree with this comment – much of Section 6.6. is concerned with "human adaptation"; in fact many reviewers say the balance is too much in favour of human systems; Ch 17 is all about adaptation, we must leave all the generic content to that

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							chapter
6-1122	A	43	37			This paragraph makes the dynamic approach sound difficult - it might be interesting to explore where, if at all, it has been tried and the results of the effort (in terms of process not specifics). Perhaps this section might inspire rather than focus on why things are tough? (Denise Reed, University of New Orleans)	Noted, and action will be taken
6-1123	A	43	45	43	47	The following sentence is incorrect: "But there is a mismatch between the broad geographical scale at which strategic planning usually takes place and the narrower spatial scale of decision-making on coastal management interventions". There are numerous examples of excellent spatial fit between planning and decision making. Perhaps this sentence is trying to say that 'concerted management and planning effort is required to ensure that broad scale coastal planning cascades effectively through to local-scale decision making'. For this to take place, decision-makers should understand the spatial relationship between planning and management tools and techniques and the optimal decision points for impact mitigation. (Robert Kay, Coastal Zone Management (Australia) Pty Ltd)	This is the conclusion reached by Few et al., after a thorough review of coastal planning. However, the amendment proposed has merit, and will be adopted.
6-1124	A	43	47		49	This is a critical point that should be included in the executive summary. Talk about a message that needs to be heard loud and clear (rather than hidden on page 43 deep down in a report…)!!! (Susanne Moser, National Center for Atmospheric Research)	Noted
6-1125	A	43	48	43	49	The following sentence is incorrect: "Moreover, the time horizons of coastal planning are generally too short to mandate consideration of climate change impacts". This is absolutely not the case in a range of coastal planning contexts around the world. For example, in most Australian States there are coastal planning policies that require long-term planning horizons to be considered. In Western Australia, State Coastal Statement of Planning Policy (or Coastal SPP) applies current knowledge of climate change and its impact on sea level rise to the statutory planning process for approximately one third of Australia's coastline (Western (Robert Kay, Coastal Zone Management (Australia) Pty Ltd)	This is the conclusion reached by Few et al., after a thorough review of coastal planning. The conclusion will be qualified
6-1126	A	43	49	43	49	I do not agree with the statement; I suggest an additional qualifier 'though most countries apply ICZM too vaguely and too theoretically' (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	Noted, and action will be taken
6-1127	A	43	49			The statement "Conditions of coastal areas are deteriorating allover the world despite over 30 years of practical experience in integrated coastal management (ICM) (Belfiore, 2003; Agardy et al., 2005)" is factually correct, but misleading. The sentence needs rewording. The sentence infers a direct causal relationship	Noted, and action will be taken

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						between the degradation of coastal areas, and failed attempts to manage this degradation through ICM. While this may be the case, there is little, or no, evidence to make this link. Indeed, it may be that without ICM this degradation at a global scale would be significantly greater. There is substantial evidence of the localized successes of ICM. Suggested alternate wording is: "Recent global analysis has concluded that the conditions of coastal areas are deteriorating all over the world (Agardy 2005). This is an issue of major concern, especially given the considerable efforts to reduce coastal degradation and points to problems in the ability of current coastal management approaches, although the direct relationship between coastal conditions and coastal management effectiveness is only recently become a subject of concerted analysis (Kay and Alder 2005)." (Robert Kay, Coastal Zone Management (Australia) Pty Ltd)	
6-1128	A	43				Box 6.3 does not exist. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	This reference to Box 6.3 should have been deleted from the FOD - apologies
6-1129	A	44	1	44	8	The tools are not clearly listed in this paragraph. Only in the last sentences there is a short comment about using GIS, but it is not enough. The principal potential readers for this chapters are decision-makers, so the more clear and objective is the text, the more useful it will be. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Only tools of specific and direct relevance to coastal and low lying areas can be discussed in Ch 6; other AR4 chapters will review other tools, of either specific or general relevance, as appropriate; more tools will be discussed here, as space allows
6-1130	A	44	1	44	35	At ll 6 to 8, there is a discussion of the use of GIS decision based support systems for coastal management. I would strongly agree with this observation, and refer to the Beaufort Sea Project for Climate Change (www.beaufortseaclimatechange.com) as a Canadian example for the Beaufort Sea. Recent integrated management recommendations for the Beaufort Sea Large Ocean Management Area are considering the use coastal and offshore boundaries that include fresh and marine waters and thus climatic changes in river break-up and freeze-up, and coastal boundaries that are based on the shifting ice edge, another area of climate change (M Muir , The Beaufort Sea Partnership: An Integrated Management Initiative for the Beaufort Sea, 2005) The other point that needs to be made is the importance of shared and common access to relevant data to support GID applications and GIS decision based support systems. For ll 11 to 35, there are discussions of practical options for coastal managers. For Europe, I would suggest it is necessary to include and expand the examples that are being considered, and to incorporate practical and ongoing initiatives that address climate change at various scales. For example, there is the ESPACE project (www.espace-project.org). ESPACE or the European Spatial Planning: Adapting to Climate Events is a four-year European project that	Noted, and action will be taken, as space allows

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						includes UK, Netherlands, Belgium and Germany, and promotes awareness of the importance of adapting to climate change and to recommend that it is incorporated within spatial planning mechanisms at local, regional, national and European levels. Focussing on North West Europe, ESPACE looks at how water and coastal resources are managed, and future plans for a changing climate. There are similar initiatives within the UK for various regions, including the Thames 2100 initiative that addresses climate change and flood defenses for the Thames Estuary and London. Under the Thames 2100, the Environment Agency is reviewing studies undertaken and identifying further research needs in order to obtain an overview of coastal defence in the wider area for the period up to 2100. The study is also identifying opportunities for habitat creation and managed retreat/ realignment on the basis of a habitat audit. This will establish the type and extent of habitats and identify the need for habitat creation. The study boundary has been set at Sheerness / Shoeburyness. It will however, be necessary to consider processes outside these boundaries as decisions on management of defences in the estuary could have major impacts elsewhere. (Magdalena Ariadne Kim Muir, Arctic Institute of North America (AINA), and EUCC-Coastal Union)	
6-1131	A	44	1			It would be very interesting to include a breif discussion of the pluses and minuses of the tools cited here. (Denise Reed, University of New Orleans)	Noted, and action will be taken, as space allows
6-1132	A	44	1		8	This sounds all like natural science tools in particular the stress on GIS tools. (Wim Salomons, Institute for Environmental Studies. Free University Amsterdam)	Noted, and action will be taken, as space allows
6-1133	A	44	2		8	The need for better decision-support tools is critical. In practice, the conclusions and implications from a strategic planning exercise usually have to be absorbed into a business or government agenda that is already crowded. It is important to have greater clarity about possible future problems, but that does not remove the need to make the large number of day-to-day decisions involved in managing a business or government department. So it is important to have a clear set of priorities for action. A probability – impact matrix is a simple but effective way of organizing these priorities. It is similar to the triage used by military doctors when dealing with overwhelming numbers of incoming casualties. Low probability, low impact events - events that are thought relatively unlikely to occur, and would not have very serious consequences if they did, can be safely ignored. High probability, low impact events - events that are thought likely to happen, but are not expected to have very serious consequences, can be given a low priority.	Noted, and points made will be included, as space allows

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						High probability, high impact events - events that are thought likely to happen, and likely to have important consequences, are clearly the top priority. These are the events that might, for example, pose a serious threat to the nation. The most difficult category, with regard to the formulation of an appropriate response, is the high impact, low probability events. These are events that are not currently thought likely to occur, but would have very serious consequences if they did. This makes it important to monitor these situations carefully, and remain alert to possible signs of change. It is obviously sensible to allocate most of the scarce management time and investment capital to high impact, high probability events, but it is also important to make provision for monitoring high impact, low probability events. For example, the US Federal Emergency Management Agency knew that New Orleans was potentially vulnerable to a severe hurricane, and had identified this as one of the three worst disasters that could befall the United States. This was, however, seen by the administration as a relatively low probability event. The problem is that most people tend to assume that past behaviour is the best guide as to the pattern of future behaviour. This is, of course, often correct. However, there are times when this assumption is not only wrong, but actually unhelpful, because people may assume a level of continuity and resilience that does not exist. (Anthony Clayton, University of the West Indies)	
6-1134	A	44	4			Good section on ICM. (Robert Kay, Coastal Zone Management (Australia) Pty Ltd)	Noted
6-1135	A	44	7	44	8	this sentence looks a bit tautological - the development isn't the ultimate point of GIS DSS - it's the usefulness and usability that matters! (Sarah Cornell, University of Bristol)	Noted, and action will be taken, as space allows
6-1136	A	44	7	44	7	Abbreviation: GIS= Geographic information system. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken
6-1137	A	44	8			Socio-economic issues should be incorporated as well. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Noted, and action will be taken, as space allows
6-1138	A	44	10	44	28	This and other paragraphs in this section read like a series of disjointed headlines and associated references, rather than a train of thought. (Donald Boesch, University of Maryland Center for Environmental Science)	Noted, and action will be taken
6-1139	A	44	10			6.6 somewhere this section should mention the possibility of raising ground levels in response to s.l.r. over a broad area. In the case of Venice there is a prospect of "reclaiming" a relative difference of about 30cm w.r.t. sea level by means of deep	Noted, and points made will be addressed, as space allows

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						injection of fluids in the subsoil. Comerlati A. et al (2003) Can CO2 help save Venice from the sea? EOS 84 (49) 9 Dec 2003 546, 552-553, American Geophysical Union (Pierpaolo Campostrini, CORILA)	
6-1140	A	44	10	44	28	There are too many long sentences in this paragraph. The first part, from lines 11 to 16 could be simplified and presented in topics, for instance. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken
6-1141	A	44	10	44	28	"soft" protection has not enough depicted since it can be a "win-win" measure to defense sea level rise and protect natural ecosystem (Daidu Fan, Tongji University)	Noted, and action will be taken, as space allows
6-1142	A	44	11	44	12	[1] I would modify this sentence to read: "The coastal manager has many practical options for SIMULTANEOUSLY adapting to RISKS DUE TO VARIABILITY IN THE CURRENT CLIMATE AND climate change (Yohe ... Daniel 2001). THIS IS AIDED BY THE FACT THAT " [2] At that point, I would stick in the current para from lines 30 to 34. (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted, and action will be taken, as appropriate
6-1143	A	44	11	44	28	This section implies that protection is the most viable option in some areas and retreat in others. The reasons for this must be outlined. Is moving settlements always out of the question?The rationale behind the options that are required (line 19) must be explained. (Denise Reed, University of New Orleans)	Noted, and action will be taken, as space allows
6-1144	A	44	11		11	"The coastal manager" is a general misconception among natural scientists. There is no coastal manager as a benevolent dictator who has the authority for a coastal zone. In real world it will be a committee composed of stakeholders with conflicting interests. (Wim Salomons, Institute for Environmental Studies. Free University Amsterdam)	Noted, and point will be addressed, as space allows
6-1145	A	44	14			"accommodate strategies" - needs linguistic fixing (Susanne Moser, National Center for Atmospheric Research)	Noted, and action will be taken
6-1146	A	44	16	44	16	Add ' Further, there is increased recognition that adaptation measures should be chosen by people of the locality.' (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	Noted, and action will be taken
6-1147	A	44	19	44	28	are you saying that developing countries can make the coastal mistakes we in the concrete-heavy countries have already learned are too costly to sustain? (Sarah Cornell, University of Bristol)	Definitely not – the section refers to marine protected areas, managed retreat, including landward migration of natural ecosystems and
6-1148	A	44	19		21	the use of "will" in all these sentences feels rather strong to me. Very predictive and even normative, matter of fact that I don't think we can support. State more	Noted, and action will be taken

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						carefully. (Susanne Moser, National Center for Atmospheric Research)	
6-1149	A	44	21	44	21	Add ' including mangrove belt along the coast' after the reference (and Zhang, 2000) (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	Noted, and action will be taken
6-1150	A	44	22		24	In principle MPAs are not a buffer for climate change, they can be important for adaptation where they may be an important source of biodiversity and for restoration material. The exception is mangroves - but current MPAs represent a small % of mangrove areas. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Noted, and point will be noted, if space allows
6-1151	A	44	25		28	Please give a reference that managed realignment is firmly on the agenda in Germany. Who's agenda by the way: the scientists, the policy maker, the local farmer or fisherman ? (Wim Salomons, Institute for Environmental Studies. Free University Amsterdam)	The reference is given – it is on the agenda of those responsible for such decision making
6-1152	A	44	25			managed realignment is now firmly on the agenda' There are however alternative, published views which discuss the resistance to the extension of the small UK trials. The European wide review of Wolters et al. (2005) should be quoted and the extensive North American literature from the Atlantic, Gulf and Pacific coasts. (Thomas SPENCER, Cambridge University)	Noted, and alternative views will be noted, as space allows
6-1153	A	44	28	44	28	remove 'submitted' reference (Derek Jackson, University of Ulster)	This will be published by the deadline of IPCC
6-1154	A	44	30	44	35	This paragraph does not add much to the text. Please also refer to comment no. 3. The Indian Ocean tsunami taught lessons about coastal management issues undoubtely. But tsunamis are not related to climate change. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken, as appropriate
6-1155	A	44	33	44	35	Add Hurricane Katrina and its impacts to New Orleans to this sentence. (Donald Cahoon, Patuxent Wildlife Research Center, Beltsville Lab)	Noted, and action will be taken, as space allows
6-1156	A	44	35			In this report, extraordinary weather events are frequently refered, while techtonic movement and tsunami or land subsidence etc. are seldom. That seems to be lack of co-operation among experts and scientists. In Japan, countermeasure against tsunami is very similar to adaptation to slr. Even in Indonesia (Sumatera), CALTEC and LIPI have long studied about history of tsunami and techtonic movement around Padang city, through analysis of historical document, growing pattern of coral leaf and recent GPS measurement, to reveal that at previous quake and tsunami event in 1797 and 1833, totally around 3m of sudden land subsidence occured, which has recovered c.a. 70% up to now. This kind of long term repetive	Noted, and action will be taken, as space allows – but other reviewers have raised concerns when stresses not related to climate change are considered

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						techtonic movement should be compared to long-term sea level rising, for future disaster prevention plan (CALTECH, LIPI, JSPS : International Meeting on Sumatran Earthquake Challenge, Padang, Auf.24-28,2005, that issued white paper for the local government). Some author(s) are recommended to participate in this report (e.g. Prof. Kerry Sieh, CALTECH, Hilman Natawidjaja, LIPI) (Hideyuki Kobayashi, Ministry of Land, Infrastructure and Transport)	
6-1157	A	44	35			You've used the Indian ocean tsunami many times, but make little mention of Hurricane Mitch in the Caribbean, or the first-even southern Atlantic hurricane that hit Brazil. Can't we get a greater diversity of examples that are all good to ame the points you're trying to make here?! (Susanne Moser, National Center for Atmospheric Research)	Noted, and action will be taken – note that other chapters are addressing the extreme events that have been identified
6-1158	A	44	35			what ARE the lessons learned? (Thomas SPENCER, Cambridge University)	This question raises a quandary – other reviewers want to de-emphasis the tsunami; this reviewer wants more information; hopefully a reference will suffice
6-1159	A	44	37	45	2	This paragraph about current adaptation dos not address the subject. It is not useful just to cite the literature. Which are the approaches used? The readers to this chapter will not have much available time to search for the cited bibliography, and then look for the adaptation approaches. It is also vague to say the "time horizons of coastal planning..." (line 48) and not give a time-scale: years? decades? (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken, as space allows
6-1160	A	44	37	45	16	The reference to current practises and planned adaptation, and integrated coastal zone management ar good, but too theoretical. At this stage, there are and should be discussion of actual current practises, planned adaptation and ICZM. Additionally, there also needs to be a consideration of changes to regulation and governnance approaches to allow ICZM approaches for climate change to actually be implemented. In difference ways, globally, regionally and nationally, there are regulatory and governance impediments to the appropriate implementation of integrated management responses. (Magdalena Ariadne Kim Muir, Arctic Institute of North America (AINA), and EUCC-Coastal Union)	Noted, and action will be taken, as space allows
6-1161	A	44	37			Added value could be improved here. There is a need for land-use planning to be more in-turn with coastal climate change risks and marine spatial planning (newly emerging). E.g. PPG 25. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Noted, and action will be taken, as space allows
6-1162	A	44	41			Please provide the list of "generic approaches". (Gregg Brunskill, Australian Institute of Marine Science)	Noted, and action will be taken

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6-1163	A	44	41			Some indication of the five generic approaches may be helpful (Loraine McFadden, Middlesex University)	See comment above
6-1164	A	44	41		45	The five generic approaches that are to replace to simplistic 3 before - spell them out. Since the Kay and Alder book isn't out yet, we need to know what they are. Moreover, the previously used three are so deeply sunk into our consciousness, you need to say more about the 5 replacement strategies and why they serve us better. (Susanne Moser, National Center for Atmospheric Research)	Noted, and action will be taken, as space allows; Kay and Alder is available as first edition
6-1165	A	44	41			The five generaic approaches shoul.d not be discussed unless tey are itemised. (Denise Reed, University of New Orleans)	Noted, and action will be taken, as space allows
6-1166	A	44	41	44	41	"Five generic approaches…" It might be best to list these or at least summarize them for the interested reader. (Kevin Walsh, University of Melbourne)	Noted, and action will be taken, as space allows
6-1167	A	44	48		50	Sri Lanka coastal legislation mandates a 100m buffer zone which serves a number of purposes including climate change - problem is that it is not enforced. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Noted, and action will be taken
6-1168	A	45	1		2	Important to consider time scales of coastal stability and that development timeframes are much shorter than natural variation in coasts. So that in some areas governments are spending funds to fight natural processes that occur over decades and that were not evident when developments were undertaken. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Noted – see "Current practices and planned adaptation" in Section 6.6.1
6-1169	A	45	2			at the end of this paragraph, add a reference and tell us of the empirical basis for that claim. I have yet to see that to be true!!!! In fact, I know of examples in the US where exactly the opposite is happening! (Susanne Moser, National Center for Atmospheric Research)	Noted, and action will be taken, as space allows
6-1170	A	45	4	45	16	Add reference to Visser, L ,2004, Introduction, In: Challenging Coasts, who points out that ICM in developing countries must take account of the needs of development too. In addition, Visser points out the importance of asking: management, or development, for who? - implying that different social groups have different perspectives. (Maarten Bavinck, University of Amsterdam)	Noted, and action will be taken, as space allows – reference appreciated
6-1171	A	45	4	45	16	worth mentioning major institutional/policy buy in, like the EU's ICZM demonstration projects? (Sarah Cornell, University of Bristol)	agreed
6-1172	A	45	4	45	16	The paragraph does not describe HOW does integrated coastal management works. Please refer to the comment above. Examples of successful ICM projects should be given here. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	This is beyond the scope of the chapter; Kay and Alder, and other key references that have been identified, give this information

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6-1173	A	45	4		16	Isn't Integrated Coastal Zone Mangement (ICZM) more often used than ICM? (Luciana das Neves, Hydraulics and Water Resources Institute | Faculty of Engineer, University of Porto)	Noted, and action will be taken
6-1174	A	45	4			References out of date. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	The references will be updated, if available. They are not included in TAR
6-1175	A	45	5	45	16	In particular lines 13-16. Quite a weak summary of the current status of knowledge on ICM. Olsen (2003) <Ocean & Coastal Management, 46, 347-361> and Christie (2005) <Is Integrated Coastal Management Sustainable, Ocean & Coastal Management, 48, 208-232> address issues of the sustainability of, and progress towards, ICM from the issues of governance and stakeholder engagement. McFadden <Governing coastal spaces: the case of disappearing science, in review Ocean and Coastal Management> argues that a lack of basic knowledge on the integrated behaviour of the coastal system also limits progress towards the integrated management of coastal systems -- though this issue is very rarely (if ever) addressed in ICM literature. This is an area to which research on the integrated response of coastal systems to climate change could provide interesting and helpful contributions. This reviewer would be happy to write a few sentences to update this section, if this would be helpful/required. (Loraine McFadden, Middlesex University)	Noted, and action will be taken, as space allows
6-1176	A	45	8	45	8	Add 'Recently Bangladesh has initiated ICM approaches with adoption of Coastal Zone Policy and Strategy at government level with emphasis to deal with climate change (Islam, 2004)' (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	Noted, and action will be taken, as space allows
6-1177	A	45	11			add this reference to the Kennish 2002 one: Moser, Susanne. “Impacts Assessments and Policy Responses to Sea-Level Rise in Three U.S. States: An Exploration of Human Dimension Uncertainties.” Global Environmental Change, in press. (Susanne Moser, National Center for Atmospheric Research)	Noted, and action will be taken, as space allows
6-1178	A	45	13		15	Once again I believe it would be profitable to look at EUrosion Study findings. (Luciana das Neves, Hydraulics and Water Resources Institute | Faculty of Engineer, University of Porto)	Noted, and action will be taken, as space allows
6-1179	A	45	13	45	13	"… in the long run (El-Reay, 1997), but ICM has often been limited…" The problem is not only in central American (Yves Henocque, Department of Fisheries)	Noted, and action will be taken
6-1180	A	45	13	45	13	...in Central America… (Bhawan Singh, Université de Montréal)	See comment above
6-1181	A	45	14		14	Why only in Central America. Is it implemented in the rest of the world. The whole	The reference quoted reaches this conclusion;

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						subsection need strong editing anyhow (Wim Salomons, Institute for Environmental Studies. Free University Amsterdam)	action will be taken, as space allows
6-1182	A	45	15	45	15	Abbreviation: NGO = non-Governmental Organisations (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken
6-1183	A	45	19	47	10	cancel (Qilun Yan, National Marine Environmental Monitoring Center)	IPCC Plenary requires this section
6-1184	A	45	21		27	A 1 m rise is a wild exageration. The following prediction estimates for 2100 apply; (1) IPCC (2001) +47 +/-39 cm, (2) INQUA (2000) +10 +/-10 cm, and (3) Mörner (2004, 2005) +5 +/-15 cm. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	The 1 m is a "scenario"
6-1185	A	45	21	47	10	The paragraph 6.6.2 seems to be a little bit too strong focused on the British Island. I assume that there are as well some good calculations from other countries. Because it is an international report it might be good as well if all costs are given in US $, not in locl currencies. (Klaus Schwarzer, Institute of Geosciences, Coastal and Continental Shelf Research)	Noted, and action will be taken, as space allows
6-1186	A	45	27	45	32	Why not provide the global totals for the columns in the table? I would also provide an estimate as to when a 1-meter rise might occur. (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted, and action will be taken, as space allows
6-1187	A	45	30	45	32	Some data in this table deserve to be emphasized in a following analysis: the high number of emigrants from Asia and Africa, and the high protection costs in Asia, Latin America, and OECD Europe. Connect this to the fact that the developing countries concerned do not avail over amounts this large. (Maarten Bavinck, University of Amsterdam)	Noted, and action will be taken, as space allows
6-1188	A	45	30		32	Table 7.5…do this cost estimate for change in ecosystem services of estuaries, fisheries, agriculture and aquaculture, human heat stress and disease, freshwater supplies. (Gregg Brunskill, Australian Institute of Marine Science)	Such an analysis would be very informative, but unfortunately it is not in the published literature; IPCC cannot undertake research
6-1189	A	45	30			1 m is out of the question. Why using this unrealistic "maximum frightening" value? It is bad and unscientific. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	The 1 m is a widely used "scenario"
6-1190	A	45	30	45	32	Does the number of emigrants shown in table 6.5 refer to conditions after the usage of the stated amount of money on coastal protection or without it. The number of emigrant should be related to the number of people risking storm surge in the future as mentioned on page 39 line 39-50 (Morten Pejrup, Institute of Geography University of Copenhagen)	The questions raised will be addressed in the SOD
6-1191	A	45	38	45	38	Abbreviation: GDP = global development patterns? Please explain.	See response to 1036

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						(Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	
6-1192	A	45				Table 6.5 Where does Canada fit? AS part of OECD America - then add it along with Mexico. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Mexico is not part of OECD America; will revise category
6-1193	A	46	1	46	21	Figure 6.5: This is a very useful figure. Nevertheless it is very confusing to separate the no. of migrants to the costs. Please separate the graphic in 2 (a and b, for instance) or use a legend and dotted/coloured line patterns for each one of the scenarios. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken
6-1194	A	46	1			thousand people must be thousand people per year (John Ronde de, Rijkswaterstaat/ RIKZ)	Noted, and action will be taken
6-1195	A	46	1			million US dollar must be million US dollar per year (John Ronde de, Rijkswaterstaat/ RIKZ)	Noted, and action will be taken
6-1196	A	46	2		21	Test the model in Figure 6.5 with the money spent to move the people of New Orleans out of town, and the cost of people displacement from Hurricane Rita and Katrina and some Asian cyclones. (Gregg Brunskill, Australian Institute of Marine Science)	Noted
6-1197	A	46	23		26	I might have missed the point with this sentence. I don't see the significance - some tropical areas which will bare the brunt of climate change have economies heavily dependent on tourism. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Noted – text will be clarified
6-1198	A	46	23	46	25	This sentence on MPAs seems out of place amidst a discussion of the costs of coastal defence and retreat. (Donald Boesch, University of Maryland Center for Environmental Science)	Noted, and action will be taken
6-1199	A	46	23	47	2	It would be appropriate to have some information about the estimated cost of coastal defences being contemplated in and around New Orleans following Hurricane Katrina (ca US$ 20 billion). While not yet published in scholarly papers, such figures are available from numerous news media accounts. (Donald Boesch, University of Maryland Center for Environmental Science)	Noted, and action will be taken
6-1200	A	46	23			MPA - Is this acronym defined in the text? (Donald Cahoon, Patuxent Wildlife Research Center, Beltsville Lab)	Noted, and action will be taken
6-1201	A	46	23	46	38	There is a mix of currencies in the text (US$ and Pounds). Please use only one currency (US$ / EUR ?). All the costs cited in the text could be converted into a table, to facilitate the understanding. It would be useful to cite examples from Asian/African/S. American countries (if possible). (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken, as space allows
6-1202	A	46	23	46	23	Abbreviation: MPA = ?	See response to 1200

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						(Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	
6-1203	A	46	23		24	What does "conserving 20-30% of the world's oceans" mean? - putting them into MPAs? Or what? Specify. (Susanne Moser, National Center for Atmospheric Research)	Noted, and action will be taken
6-1204	A	46	23			Watch Acronymns. MPA is not spelled out. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	See response to 1200
6-1205	A	46	23			Convert numbers to the same units, so that they can be compared. This section is futile at present. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	See response to 1201
6-1206	A	46	23			It is not clear why MPAs are an appraoch to adaptation. (Denise Reed, University of New Orleans)	They are often an important strategy in ICZM, which in turn is usually considered as an effective, no regrets, adaptation option – see last para of 6.6.1
6-1207	A	46	23		25	Why this reference to conserving the world seas as an ecosystem, this is unrelated to climate change as far as I know. By the way this whole section needs editing (Wim Salomons, Institute for Environmental Studies. Free University Amsterdam)	See response to 1206
6-1208	A	46	25	46	25	While GDP may well increase as a result of expenditure on coastal protection works, this is not necessarily a good thing in itself, as there are competing demands for public expenditure, some of which might do more for the GDP in the long term than coastal protection would -- for example, expenditure on railways or primary school education. So increasing the GDP in itself is not necessarily a strong argument here for coastal protection works. (Kevin Walsh, University of Melbourne)	Noted, and action will be taken, as space allows
6-1209	A	46	28		38	I could not gain additional insight from this part of the paragraph and feel that this lines could be omitted. (Wilhelm Windhorst, Kiel University)	Noted, and action will be taken
6-1210	A	46	34		38	Can this be expressed/updated to 2000 dollars? (Susanne Moser, National Center for Atmospheric Research)	Noted, and action will be taken
6-1211	A	46	38			Again - maintenance needs to be considered as well as the costs of losing the ecosystem services.; (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Noted, and action will be taken
6-1212	A	46	40	46	50	What and where are Ramsar sites? Please use only one currency (US$ / EUR ?) in the text. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Additional details are available from the cited reference; will use one currency
6-1213	A	46	44			Reword to make reduction in costs more clear. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Noted, and action will be taken
6-1214	A	46	46			People globally won't be aware of these conservation designations. Reword to	Noted, and action will be taken

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						make more universally meaningful. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	
6-1215	A	46	46	46	50	The cost mentioned compares to 6000 Pound per square meter. This is more than a site for building in a metropol. I think that this amount should be commented on. In my opinion nobody would use this amount of money for habitat replacement (Morten Pejrup, Institute of Geography University of Copenhagen)	Noted, and action will be taken
6-1216	A	47	5		10	It would be good if this table indicated whether the losses and costs were direct market values; and if they also accounted for lost ecosystem services such as pollution control, food provisioning etc. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Noted; additional information will be provided, as space allows
6-1217	A	47	5		10	Table 6.6 appears to give the cost only of sea level rise impacts on the Pearl Delta. What about heat stress, loss of freshwater wetlands, disease, loss of agriculture and mangroves? (Gregg Brunskill, Australian Institute of Marine Science)	Noted; additional information will be provided, within the limits of the study
6-1218	A	47	5	47	10	Table 6.6: Would it be posible to express the values of costs, losses and benefits in US$ or EUR ? (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	See response to 1212
6-1219	A	47	5		10	A Table "in press" has little value. Only large rise values are considered – why not the minumum (9 cm) value of IPCC? 100 cm is out of the question. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	See response to 1184; the paper will be published by the IPCC deadline
6-1220	A	47	11			Again, add something on what economists have studied far less, given less attention to. (Susanne Moser, National Center for Atmospheric Research)	Noted; additional information will be provided, as space allows
6-1221	A	47	13	51	21	Reduce to within 3 page (Qilun Yan, National Marine Environmental Monitoring Center)	These sections have been requested by IPCC Plenary; effort will be made to reduce space taken
6-1222	A	47	15	47	21	This has been said before in the text. The paragraph could be simplified in this case. See comment no. 4. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken
6-1223	A	47	15	47	15	After …. Centuries, ADD as it has for millenia, (John Everett, Ocean Associates,Inc.)	Noted, and action will be taken
6-1224	A	47	15		21	far too speculative. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Such scenarios are being used as a basis for planning; this will be clarified
6-1225	A	47	15	47	21	Re. the previous comment. While other climate change factors (e.g., rising temperature) will impact human communities and ecosystems, the text focuses on sea level rise. (Franklin Schwing, NOAA Fisheries Service)	Noted, and action will be taken, as space allows

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
6-1226	A	47	19			Depending on how fast SLR will occur, some coral reeefs may be able to adapt [References: [1] Gates, R.D. and Edmunds, P.J. 1999. The physiological mechanisms of acclimatization in tropical reef corals. American Zoologist 39: 30-43. [2] Adjeroud, M., Augustin, D., Galzin, R. and Salvat, B. 2002. Natural disturbances and interannual variability of coral reef communities on the outer slope of Tiahura (Moorea, French Polynesia): 1991 to 1997. Marine Ecology Progress Series 237: 121-131. [3] Rowan, R. 2004. Thermal adaptation in reef coral symbionts. Nature 430: 742. [4] Baker, A.C., Starger, C.J., McClanahan, T.R. and Glynn, P.W. 2004. Corals' adaptive response to climate change. Nature 430: 74.]. See also comment 2. In addition, some reefs could be susceptible to cold temperatures [Refs: [1] Yu, K.-F., Zhao, J.-X., Liu, T.-S., Wei, G.-J., Wang, P.X. and Collerson, K.D. 2004. High-frequency winter cooling and reef coral mortality during the Holocene climatic optimum. Earth and Planetary Science Letters 224: 143-155. [2] Coles, S.L. and Fadlallah, Y.H. 1990. Reef coral survival and mortality at low temperatures in the Arabian Gulf: New species-specific lower temperature limits. Coral Reefs 9: 231-237. (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted, and action will be taken, as space allows
6-1227	A	47	19	47	21	The forecasts of coastal systems adaptation to the 10 meter sea level rise into the next millennium are similar to science fiction. They should not be mentioned in this Chapter. (Stanislav Ogorodov, Lomonosov Moscow State University)	Such scenarios are being used as a basis for planning; this will be clarified
6-1228	A	47	23	47	27	The sentences are too long and not clear. Avoiding the use of ";" would much simplify the text lecture. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken, as appropriate
6-1229	A	47	23			Insert "staying in place and" after after "limits to " . (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted, and action will be taken
6-1230	A	47	25			Nicholls et al., submitted reference is not in Bibliography; add the Moser 2005 reference (GEC, in press) given above. (Susanne Moser, National Center for Atmospheric Research)	Noted, and action will be taken
6-1231	A	47	25			submitted references not in reference list. More references by social scientists exist and should be added. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Noted, and action will be taken
6-1232	A	47	26			Replace "making entire" with "potentially making some". (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted, and action will be taken
6-1233	A	47	27	47	33	Here is the important information, but is it is lost in the paragraph because the "introduction" sentences are not clear. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted; text will be revised

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6-1234	A	47	30	47	33	These three sentences are repeated verbatim on page 51, lines 18-21. (Donald Cahoon, Patuxent Wildlife Research Center, Beltsville Lab)	Noted, and action will be taken
6-1235	A	47	32		33	This claim was made before and I think it's not acceptable like this. What's Tol's assumption about what pots of money mitigation and adaptation will be paid out of. Not necessarily the same. This needs to be more carefully stated. Maybe this is also scale dependent?! (Susanne Moser, National Center for Atmospheric Research)	Noted, and the questions will be addressed, as space allows
6-1236	A	47	35	47	38	See comment no. 4. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken
6-1237	A	47	38	48	2	A table or some concrete examples would be useful to illustrate this topic. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted; suggestion will be followed, if space allows
6-1238	A	47	40			and flood risk infrastructure. (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	
6-1239	A	48	2	48	10	There is repetition of section 6.1 (coral reefs). This paragraph seems to contradict section 6.6.1. The text is confusing because there where no concrete examples of what is exactly integrated coastal management. Please check. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken
6-1240	A	48	2	48	7	However, see comments 2 and 13. Need a little balance here. (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted, and action will be taken, as space allows
6-1241	A	48	7	48	10	Can be deleted as already mentioned under 6.6.1 (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	Noted
6-1242	A	48	7			Conditions of coastal areas are deteriorating all over the world' seems like an over generalization - examples can be found all over the world but this almost implies that every coast is deteriorating. (Denise Reed, University of New Orleans)	Noted; text will be revised
6-1243	A	48	8	48	8	should read: "…. Practical experience in coastal zone management. In many instances worldwide, management systems have failed…" otherwise it is contradicting with what is said page 45, line 12 (Yves Henocque, Department of Fisheries)	Noted, and action will be taken
6-1244	A	48	12			An additional consideration within the realm of "knowledge gaps" is the interdisciplinary work needed to integrate climate change forecasts and impacts with decision making processes and policy choices. In some cases sea level rise of tens of cm will not affect the impacts of rare, extreme, catastrophic events or the system requirements for defence against these episodes. On the other hand, the frequency of extreme events may change due to increased m.s.l. and changing atmospheric dynamics. Trigo I. F. and Davies t. d. (2002) Meteorological	Noted, and action will be taken, as space allows – reference appreciated

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						conditions associated with sea surges in Venice: a 40 year climatology. International Journal of Climatology 22, 787-803 (Jane da Mosto, CORILA)	
6-1245	A	48	12		20	What about other opin ions? – especially observationally based results. This text is just another love song for IPCC. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Other opinions are identified in the chapter, and observational trends are examined
6-1246	A	48	20			Can also add the following references: (1) Luers, A.L., S. Moser, A. Sanstad, and M. Hanemann (forthcoming). MANAGING CLIMATE CHANGE IMPACTS IN CALIFORNIA: AVOIDING THE MOST SEVERE AND COPING WITH THE UNAVOIDABLE. CEC Discussion Paper. (2) Moser, Susanne. "Impacts Assessments and Policy Responses to Sea-Level Rise in Three U.S. States: An Exploration of Human Dimension Uncertainties." Global Environmental Change, in press.; (3) Moser, Susanne. 2005. Climate change and sea-level rise in Maine and Hawai'i: The changing tides of an issue domain. In: Clark, W.C., et al. (eds.). Global Environmental Assessments: Information and Influence. Cambridge, MA: MIT Press. (Susanne Moser, National Center for Atmospheric Research)	Noted, and action will be taken, as appropriate – references appreciated
6-1247	A	48	22	48	42	See comment no. 4. When giving examples like the Humber Estuary, it would be useful to also have a graphic scheme where the adaptation measures are organised/listed. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken, as space allows
6-1248	A	48	22	48	42	Coastal squeez for migrating ecosystems or plant communities due to sea level rise may arise also from unfavourable natural conditions for migrating ecosystems in the adjacent territories. Human settlements or other man-made facilities are not the only reasons for that. (Are Kont, Institute of Ecology, University of Tallinn)	Noted, and action will be taken.
6-1249	A	48	22		24	A point that should be added to the Executive summary (Susanne Moser, National Center for Atmospheric Research)	Noted, and action will be taken
6-1250	A	48	22	48	42	The decision to protect socio-economic systems versus natural ecosystems is also likely to be national economic fators, and ultimately any cost/benefit analysis of ecosystem goods and services. (Franklin Schwing, NOAA Fisheries Service)	Noted, and action will be taken, as appropriate
6-1251	A	48	25		28	I don't think we know yet what the ecological impacts are (but maybe can suspect that they may also not be so great) of moving back from the shoreline and increasing development intensity inland. You should acknowledge that, mention that it needs to be looked at.	Noted, and action will be taken, as space allows

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						(Susanne Moser, National Center for Atmospheric Research)	
6-1252	A	48	28		29	That is insufficient. Decisions at the local level are not just driven by local economic considerations. Read the detailed analysis of local local responses to coastal erosion in: Moser, Susanne. 2000. "Community Responses to Coastal Erosion: Implications of Potential Policy Changes to the National Flood Insurance Program." (Appendix F, 101pp.) In: Evaluation of Erosion Hazards. A Project of The H. John Heinz II Center for Science, Economics and the Environment. Prepared for the Federal Emergency Management Agency, Washington, DC (available at: http://www.heinzctr.org/Programs/SOCW/Erosion_Appendices/Appendix%20F%20-%20FINAL.pdf) (Susanne Moser, National Center for Atmospheric Research)	Noted, and action will be taken, as space allows – reference appreciated
6-1253	A	48	42			Could add also politics and cultural values; discussed in all the Moser references provided above. (Susanne Moser, National Center for Atmospheric Research)	See response to 1252
6-1254	A	48	47			Replace "… are inferior as viewed …" with "…some view as inferior... " (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted, and action will be taken
6-1255	A	48	48			I would eliminate the sentence starting on line on 48 or make it abundantly clear that this is one view which may or may not be shared by the majority of those most directly affected, i.e., the inhabitants of the coastline. (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted, and action will be taken, as appropriate and as space allows
6-1256	A	48	50			The meaning of 'almost sacrosanct' is not clear (Anthony Clayton, University of the West Indies)	Text will be clarified
6-1257	A	49	1			should add also political and legal aspects here. (Susanne Moser, National Center for Atmospheric Research)	Noted, and action will be taken
6-1258	A	49	9	50	39	This whole section has many very long sentences. See comment no. 4 (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken
6-1259	A	49	9	50	39	The concept of adaptive capacity is not explained in the text. Please describe it at the beginning of the section. Remember non-specialists will use this chapter as a guide to decision-making. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken, along with link to Ch 17
6-1260	A	49	9			6.6.4 is very confusing and should be revised seriously (Yves Henocque, Department of Fisheries)	Noted, and action will be taken
6-1261	A	49	11	50	39	Reduce by 50% (Derek Jackson, University of Ulster)	Noted, and action will be taken, as appropriate
6-1262	A	49	11	49	48	It is very useful to introduce the concept of resiliance along side concepts of adaptive capacity and vulnerability. It is mentioned near the end of the paragraphs,	Noted, and text will be revised, as appropriate

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						but not initially. It is also useful to consider the scales of adaptive management, vulnerability and resilience; as they can extend beyond local communities to ecosystems (coasts, estuaries, deltas, lagunas) and to different levels of government and regulation (sub-regional, national, regional such as EU, North America, circumpolar Arctic through Arctic Council). Arguably climate change will challenge the adaptive capacity, vulnerbility and resilience of levels of government and regulation, as much as local communities and ecosystems. (Magdalena Ariadne Kim Muir, Arctic Institute of North America (AINA), and EUCC-Coastal Union)	
6-1263	A	49	19	49	28	From "Adaptive capacity…. " should be deleted (Yves Henocque, Department of Fisheries)	In the absence of any reason to delete the text, this comment cannot be taken overly seriously
6-1264	A	49	26	49	28	also section 6.7 - the series of Gulf of Mexico storms and hurricanes, especially Katrina, show the heteorgeneity of vulnerability, the 'paradigm' changes that relate to high visibility, high impact events, and the human/climate additive effects when it comes to impact attribution. (Sarah Cornell, University of Bristol)	Noted, and action will be taken
6-1265	A	49	26			Replace "adaptation" with "adaptive capacity". (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted, and action will be taken
6-1266	A	49	28			Moss et al. (2000?) wrote a paper comparing vulnerabilities across nations and has some interesting things to say here to. (Susanne Moser, National Center for Atmospheric Research)	Noted, and action will be taken
6-1267	A	49	31	49	35	Here is important information, but it is lost in the paragraph. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken to clarify the text
6-1268	A	49	31	49	43	From "This is a….." should be deleted (Yves Henocque, Department of Fisheries)	See response to 1263
6-1269	A	49	33			Suggest changing the start of the sentence Natural coastal buffers to Natural coastal habitats - since most if not all coastal habitats will help to reduce the impacts of climate change. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Noted, and action will be taken
6-1270	A	49	38		40	There was a recent article on this in GEC. Should be referenced. Also see: (1) Adger, W. N. 2003. Social capital, collective action and adaptation to climate change. Economic Geography 79: 387-404. (2) Fountain, J. E. 1998. Social capital: a key enabler of innovation in L. M. Branscomb and J. Keller, eds. Investing in innovation: Toward a consensus strategy for federal technology policy. MIT Press, Cambridge, MA. (3) Lehtonen, M. 2004. The environmental-social interface of sustainable development: capabilities, social capital, institutions. Ecological Economics 49: 199-214. (4) Pelling, M. 1998. Participation, Social Capital and	Noted, and action will be taken, as appropriate and as space allows

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						Vulnerability to Urban Flooding in Guyana. Journal of International Development 10: 469-486.: (Susanne Moser, National Center for Atmospheric Research)	
6-1271	A	49	40		44	Great to see the importance of social capital and its role in adaptation - is it possible to illustrate it with a concise, short example? (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Noted, and action will be taken, as space allows
6-1272	A	49	47		48	Please expand the effects of globalization on vulnerability. This page is well written and intelligent. (Gregg Brunskill, Australian Institute of Marine Science)	Noted, and action will be taken, as space allows
6-1273	A	49	47	49	48	Is this comment necessary? (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	See comments 1272 and 1276
6-1274	A	49	47	49	48	I disagree with the last sentence. In fact, a very good argument can be made that the reason why Sub-Saharan Africa is most vulnerable is because they did not participate fully -- for whatever reason -- in globalization (Goklany 2002b; see also Goklany 1995, 1999a, 2005b). (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted, this matter will be given more attention, as space allows – and also in Ch 17
6-1275	A	49	47		48	"Globalization…" Be more specific. How has globalization increased vulnerability, etc.? (Vivien Gornitz, Columbia University and Goddard Institute for Space Studies)	Noted, this matter will be given more attention, as space allows – and also in Ch 17
6-1276	A	49	48			Also cite article by O'Brien and Lubchenco, Double exposure (in GEC) (Susanne Moser, National Center for Atmospheric Research)	Noted, this matter will be given more attention, as space allows – reference appreciated
6-1277	A	50	1	50	2	How does this method works? How could it be applied? Please describe it. This is also important information for decision-making. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Space limits do not allow more detail to be provided – see reference that is cited
6-1278	A	50	3		7	Not sure if reference to Table 6.2 is worthwhile here. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Agreed
6-1279	A	50	3	50	7	Sentence is too complex and difficult to interpret. Needs to be rephrased. (Bhawan Singh, Université de Montréal)	Noted, and action will be taken
6-1280	A	50	9	50	12	Despite experience and education, still have unnecessary and avoidable loss, and reference to Louisiana and Florida examples where differential losses across different segments of the communities in response to recent hurricances. (Magdalena Ariadne Kim Muir, Arctic Institute of North America (AINA), and EUCC-Coastal Union)	Noted, and action will be taken
6-1281	A	50	12			At the end of this section, you should make a point about the need for deeper public discourse on adaptation needs and challenges. (Susanne Moser, National Center for Atmospheric Research)	This point is perhaps best made in Ch 17; current chapter is coasts specific, and the comment still applies

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6-1282	A	50	13		16	Surely a policy of reduced greenhouse gas emission should be included here. This paragraph is very good. (Gregg Brunskill, Australian Institute of Marine Science)	Noted, and action will be taken
6-1283	A	50	13	50	39	Here the text gets into developing strategies. Does this get beyond the scope of WGII? (Franklin Schwing, NOAA Fisheries Service)	Such discussion was requested by IPCC Plenary
6-1284	A	50	14		16	Sentence reads like the authors are advocating that developing nations should not be striving to the same standards of living (including its excesses) as developed countries. I would argue that policies that achieve economic and social equity will reduce poverty, reduce consumption of natural resources, improve environmental management etc. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Noted, and action will be taken to avoid the misconception
6-1285	A	50	14			Replace "Policies that reduce consumption" with "Policies that reduce subsidies for consumption". It is not obvious that eliminating consumption per se will advance sustainable development and improve well-being. In fact, if unsubsidized consumption stimulates economic growth that might enhance adaptive capacity (Goklany 1999a, 2005b). In fact, recognizing that economic growth , while enhacing adaptive capacity, also increases greenhouse gas emissions, Goklany (2005a) attempted to shed light on whether -- and for how long -- a richer-but-warmer world would be better off in terms of human and environmental well-being than poorer-but-cooler worlds (per the SRES scenarios and the results of the "Fast Track" assessment (FTA). His results suggest that notwithstanding climate change, through much of this century, human well-being is likely to be highest in the richest-but-warmest (A1F1) world and lower in poorer-but-cooler worlds. With respect to environmental well-being, matters may be best under the A1F1 world for some critical environmental indicators through 2085-2100, but not necessarily for others. [See comment 5]. (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted, and action will be taken, as appropriate and as space allows
6-1286	A	50	19	50	22	Which are the initiatives that will promote science based decisions? Please describe it. See comment above. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken, as appropriate and as space allows
6-1287	A	50	19	50	39	Replace by: "Many proposals for strengthening strategies have been made. One could mention the following: full and open data exchange (Hall, 2002), public participation, coordination among oceans-related bodies (West, 2003), research on responses of ecological and socio-economic systems (Parson et al., 2003), research on connections between upstream and downstream process to come up with comprehensive watershed plans (Contreras Espinosa and Warner, 2004), and short-	Noted, and action will be taken, as appropriate and as space allows – references appreciated

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						term training for practitioners at all levels of management (Smith, 2002)". (Yves Henocque, Department of Fisheries)	
6-1288	A	50	19	50	19	Add ' Cooperation among regional countries are important as countries in the south-asia have established SAARC Coastal Zone Management Centre.' (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	Noted, and action will be taken, as appropriate and as space allows
6-1289	A	50	19	50	33	The presentation in this section is really weak. Each sentence just described a separate study - the text should focus on similarities and or contrasts among them rather than simply listing them. (Denise Reed, University of New Orleans)	Noted, and action will be taken
6-1290	A	50	30	50	36	Here is important information, but it is lost in the paragraph. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken
6-1291	A	50	34	50	34	Add ' Based on such partnership, 'Integrated Coastal Resources Database' is being established in Bangladesh (Islam 2004)'. (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	Noted, and action will be taken, as space allows
6-1292	A	50	37		39	Suggest that scenarios as a tool for communities to explore future policies and adaptation strategies be included in this section. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Noted, and action will be taken, as space allows – may be better placed in 6.6.1
6-1293	A	50	42	51	21	What is "adaptation" and "mitigation"? It is not clear in this section. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	These are general terms that are defined in the glossary and elaborated elsewhere in the WG II report
6-1294	A	50	42	51	21	This whole section has many very long sentences. See comment no. 4 (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken
6-1295	A	50	42			section 6.6.5 Excellent, well argued section. Strongly supported. (Robert Kay, Coastal Zone Management (Australia) Pty Ltd)	Noted
6-1296	A	50	45			Add to the King reference: [1] Goklany, IM and King, D. 2004. Climate change and malaria. Science: 306: 55-57 (in letters), [2] Goklany 2005b. (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted, and action will be taken, as appropriate and as space allows
6-1297	A	50	45			After the King reference also make the link to Chapter 18. (Susanne Moser, National Center for Atmospheric Research)	Noted, and action will be taken
6-1298	A	50	47		48	Mitigation (by reducing greenhouse gases) has to be undertaken on a global scale to be anywhere near effective. However, adaptation will occur on a local to regional scale. How well-coordinated are such efforts likely to be? Recent events don't offer much encouragement. (Vivien Gornitz, Columbia University and Goddard Institute for Space Studies)	Noted, and the points will be explored, as space allows
6-1299	A	50	48			I cannot recognize the need to use the word adaption instead of improved coastal	Noted, and action will be taken, as appropriate

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						management, as long as the definition is limited to what is said in the text. Hence I recommend to stick to the "old" wording as long as no more differences are at stake. (Wilhelm Windhorst, Kiel University)	
6-1300	A	51	7			It would be helpful to identify what an optimal mix means. Who decides this, which indicators are used. Is the optimum what is acceptable for all? the local population? the habour industry? Wouldn´t it be better to strive for acceptable mixtures which take thresholds intao account as argues in the preceding chapters? I would prefer a change of the wording in this direction. (Wilhelm Windhorst, Kiel University)	Noted, and action will be taken, as appropriate and as space allows
6-1301	A	51	10		21	Make it clear that adapting to climate change from greenhouse gas warming is accepting the sins of the energy industry, and giving away pressure on the issue of reducing greenhouse gas emissions. A lot of this discussion appears to relate to sea level rise only, and not other heat and CO2 stresses on the ocean and land. This is a critical and perhaps a key section that should be expanded and illustrated somehow. (Gregg Brunskill, Australian Institute of Marine Science)	Noted, and action will be taken, as appropriate and as space allows
6-1302	A	51	10		11	See, here you acknowledge that mitigation and adaptation is done by different people, and by extension will be funded out of different pockets - hence the need to be more careful about claims that Peter will rob Paul (which you just do again a few lines down, lines 13-14)! At the same time, this statement needs to be more careful in acknowledging that actually quite a bit of innovation and action is currently originating at the local level. (Susanne Moser, National Center for Atmospheric Research)	Noted, and the points will be explored, as space allows, and inconsistencies removed
6-1303	A	51	10		21	I do not share the argumentation, that mitigation is done on a fundamentally different scale than improved coastal management, as long as the scales are not named. It is also not wise to criticize researchers on the one hand and to ommit sound descriptions and definitions on the other hand. As long as this paragraph stays as fuzzy as it is, I recommend to ommit it. (Wilhelm Windhorst, Kiel University)	Noted, and action will be taken to improve the text
6-1304	A	51	13	51	15	I agree. One could ask if protection of natural systems is the right way to go when resources are limited (confirm comment to page 46 line 46-50. (Morten Pejrup, Institute of Geography University of Copenhagen)	Noted; implications will be highlighted
6-1305	A	51	14		18	Highlighting the trade-offs between adaptation and mitigation is effective. Perhaps a graphic to go with it might make it easier for readers to grasp the trade-offs easier. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Noted – this is the challenge for Ch 18
6-1306	A	51	14	51	15	Replace "…for health-related impacts in poor countries, money is better spent on adaptation than mitigation" with the following: "... for impacts affecting human	Noted, and action will be taken to improve the text

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						well-being, particularly in developing countries, money is better spent on adaptation than mitigation (Goklany (2003, 2005)." This is shown to be the case not only for health related impacts but hunger, water shoratge, and coastal flooding. (Indur Goklany, Office of Policy Analysis, Department of the Interior)	
6-1307	A	51	15	51	21	This is a repetition of page 47 lines 27 to 33. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Noted, and action will be taken to improve the text
6-1308	A	51	15			The sentence beginning 'Adaptation…' seems to be a massive generalisation when no specific adaptation approach is identified. (Denise Reed, University of New Orleans)	Noted, and action will be taken to improve the text
6-1309	A	51	18	51	21	Repetition of information already presented : see page 47. (Bhawan Singh, Université de Montréal)	Noted, and action will be taken to improve the text
6-1310	A	51	21			Reference Tol (in press) missing from reference list (Loraine McFadden, Middlesex University)	Noted, and action will be taken
6-1311	A	51	21			Somewhere at the end or in this section acknowledge the limited efficiency of adaptation >> it's likely that we're underestimating the cost of impacts, and that we thus need a much greater effort to discuss and prepare for climate change impacts and needs for adapation (Susanne Moser, National Center for Atmospheric Research)	Noted, and action will be taken to improve the text
6-1312	A	51	21			The 'increased sensitivity to wetland loss by adaptation' need explaining. It is not at all clear what it means. (Denise Reed, University of New Orleans)	Noted, and action will be taken to improve the text
6-1313	A	51	22			The use of 'ideally' is overstating the case of this approach. more balanced approach would be to state that such models. show considerable promise, but have not yet been tested in a broad range of decision contexts. (Robert Kay, Coastal Zone Management (Australia) Pty Ltd)	Noted, and action will be taken to improve the text
6-1314	A	51	24			For many developing nations, coastal fisheries and aquaculture is an economic key. Therefore impacts of climate change on coastal ecosystems, and adaptations, should be a priority. (Franklin Schwing, NOAA Fisheries Service)	Noted, and action will be taken to improve the text
6-1315	A	51	24	52	30	Needs a little more flesh. Is something missing from the last paragraph (…world's coasts…)? (Miltiadis Seferlis, Greek Biotope/Wetland Centre)	Noted, and action will be taken to improve the text
6-1316	A	51	26			With regard to sustainable development and adaptive strategies; issues such as climate change can expose the hidden cost of current behaviour. For example, the New Orleans disaster was compounded by the fact that the original wetlands (plus much of the Everglades) had been drained, infilled and developed, which means that they were not longer able to absorb and buffer surges of water.	`

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						(Anthony Clayton, University of the West Indies)	
6-1317	A	51	28	51	32	These two sentences sound a bit arrogant. It would be useful to cite the countries that have already long-term planning and management of their coasts, and how these countries achieved that. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	1317 – Agreed. Sentences to be modified.
6-1318	A	51	30		34	Many developing countries have access to GEF funds to invest in ICM - therefore approach could be to incorporate climate risk in ICM initiatives that are funded international at least. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	1318 – Noted. See comment 1316.
6-1319	A	51	30	51	30	Tol et al., accepted: not in References (Bhawan Singh, Université de Montréal)	1319 – Reference to be checked.
6-1320	A	51	32	51	34	This sentence is not clear. Which scale? (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	1320 – Corrected.
6-1321	A	51	33			As already mentiioned, a definition of the scales reaching up to the global level is required. Especially because the report deals with global climate change it is necessary to show via which hierarchical scales local issues can be addressed in a systematic manner. (Wilhelm Windhorst, Kiel University)	1321 – Done. See comment 1320.
6-1322	A	51	36			This should reference the literature on foresighting and technology roadmapping, where criteria such as environmental sustainability, economic viability etc can be factored into national strategic planning. See, for example, W Wehrmeyer and A Clayton. Foresighting for Development. In W Wehrmeyer, A Clayton and K Lum (eds) Greener Management International, Special Edition on Foresighting and Scenario Planning. Greener Management International, 2003. (Anthony Clayton, University of the West Indies)	1322 – Agreed. References to be checked.
6-1323	A	51	36	51	45	This paragraph is not clear. It would be easier if there were concrete examples (model results) listed in a table or illustrated in a figure. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	1323 – Noted. Figure/table to be considered.
6-1324	A	51	36			Duplication with earlier SRES material? (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	1324 – Noted. To be removed if necessary.
6-1325	A	51	40	51	45	Replace these lines with the following: "WHILE sustainable development futures tend to share a mix of characteristics including low GHG emissions (Morita et al., 2001), SCENARIOS WITH HIGH ECONOMIC GROWTH AND A HIGH PROPENSITY FOR TECHNOLOGICAL CHANGE COULD ALSO BE COMPATIBLE WITH SUSTAINABLE DEVELOPMENT. GOKLANY (2005A), DRAWING UPON RESULTS OF THE “FAST TRACK” ASSESSMENT INCLUDING NICHOLLS (2004), EXAMINED THE STATUS OF VARIOUS	1325 – Noted but need to be shortened/rewritten.

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						MEASURES OF HUMAN AND ENVIRONMENTAL WELL-BEING FOR DIFFERENT SRES SCENARIOS OUT TO 2085 FOR THE FORMER AND 2100 FOR THE LATTER. HIS RESULTS INDICATE THAT CONSIDERING THE EFFECTS OF BOTH CLIMATE CHANGE AND NON-CLIMATE CHANGE FACTORS, THROUGH MUCH OF THIS CENTURY HUMAN WELL-BEING AS MEASURED BY THE TOTAL POPULATION AT RISK OF HUNGER, COASTAL FLOODING, WATER SHORTAGE AND PER CAPITA INCOME IS LIKELY TO BE HIGHEST, AT LEAST THROUGH 2085, IN THE RICHEST-BUT-WARMEST (A1FI) WORLD AND LOWER IN POORER-BUT-COOLER WORLDS. WITH RESPECT TO ENVIRONMENTAL WELL-BEING, MATTERS MAY BE BEST UNDER THE A1FI WORLD FOR SOME CRITICAL ENVIRONMENTAL INDICATORS BUT NOT NECESSARILY FOR OTHERS. A2 IS THE LEAST DESIRABLE FOR BOTH HUMAN AND ENVIRONMENTAL WELL-BEING. SPECIFICALLY WITH RESPECT TO COASTAL FLOODING, CONSIDERING BOTH CC AND NON-CC FACTORS THROUGH 2085, B1 (THE SECOND WEALTHIEST) HAS THE LEAST POPULATION AT RISK (PAR) OF COASTAL FLOODING FOLLOWED BY A1FI (THE WEALTHIEST), B2 AND A2 (THE POOREST), IN THAT ORDER, CONFIRMING THAT SLOW ECONOMIC GROWTH, HIGH POPULATION GROWTH AND LESS TECHNOLOGICAL CHANGE CAN LEAD TO GREATER VULNERABILITY (GOKLANY 1995, 2005B; SWART ET EL. 2003)" (Indur Goklany, Office of Policy Analysis, Department of the Interior)	
6-1326	A	51	44	52	31	What are the combined impacts of climate change (increased thermal warming and stratification, deoxygenation and ocean acidifiction) on our coastal ecosystems, can they adapt and if so can they sustain the goods and services required by future humans (Carol Turley, Plymouth Marine Laboratory)	1326 – Agreed.
6-1327	A	51	45			to adapt to adapt should be to adapt (John Ronde de, Rijkswaterstaat/ RIKZ)	1327 – Corrected.
6-1328	A	51	45	51	45	…prepared to adapt to future.. (Bhawan Singh, Université de Montréal)	1328 – Done. See comment 1327.
6-1329	A	51	47	52	30	When giving examples like using OTEC (p. 52 l. 20), please be precise: where? when? how? (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	1329 – Agreed.
6-1330	A	51	47	51	47	Typing: increasingly instead of increasing. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	1330 – Corrected.

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6-1331	A	51	47	52	30	Are these paragraphs supposed to be topics? It would be a good idea to organicse the text. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	1331 – Agreed see comment 1316.
6-1332	A	51	47	51	47	…is increasingly viewed… (Bhawan Singh, Université de Montréal)	1332 – Corrected.
6-1333	A	51	49			where are the 'following' examples? (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	1333 – Noted. Should be “situations”.
6-1334	A	52	3	52	30	This portion of the text requires careful editing for clarification. (Franklin Schwing, NOAA Fisheries Service)	1334 – Corrected
6-1335	A	52	3			"are required" is repeated (Franklin Schwing, NOAA Fisheries Service)	1335 – Corrected.
6-1336	A	52	11			First time social learning is mentioned. Should play a more prominent role in the adaptation section as well as x-refer to adaptation chapter (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	1336 – Noted. Can be in section 6.6.
6-1337	A	52	15	52	15	"For example, community-based mangement, which is inherent to any ICM programme, enhances…" (Yves Henocque, Department of Fisheries)	1337 – Corrected.
6-1338	A	52	19		21	There is a large body of literature on harvesting energy from the sea, which might be cited, and some examples given with quantative estimates of energy supply capability. (Gregg Brunskill, Australian Institute of Marine Science)	1338 – Agreed. Literature to be examined.
6-1339	A	52	19	52	21	To be deleted (Yves Henocque, Department of Fisheries)	1339 – Rejected. See comment 1339
6-1340	A	52	19	52	21	Is it new technologies that are referred to. I am sure it is so I would just add new before technologies to stress this. (Morten Pejrup, Institute of Geography University of Copenhagen)	1340 – Corrected.
6-1341	A	52	19	52	21	Problem with sentence:needs to be rewritten more clearly (Bhawan Singh, Université de Montréal)	1341 – Done. See comment 1340.
6-1342	A	52	20			OTECs are currently only viable where conditions are suitable i.e. steep shelf and in countries (mostly islands) where energy costs are high and potable water is scarce (Anthony Clayton, University of the West Indies)	1342 – Agreed. See comment 1340.
6-1343	A	52	23		27	If it referred to Hurricane Katrina it might have greater application to the readers. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	1343 – Agreed. See comment 224.
6-1344	A	52	23			I too thought that the tsunami would cause a ‘paradigm shift’ in the use of coastal management. However, there is currently (as of November 2005) no evidence that this has occurred. A more accurate statement would be that the disaster has	1344 – Agreed.

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						focussed attention on coastal management and how it relates to disaster management. (Robert Kay, Coastal Zone Management (Australia) Pty Ltd)	
6-1345	A	52	23		27	We have long-term records (Mörner et al., in prep.). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	1345 – Noted. Reference to be checked.
6-1346	A	52	23	52	28	It would be useful to expand this paragraph and provide more examples, as it is an important and key point. (Magdalena Ariadne Kim Muir, Arctic Institute of North America (AINA), and EUCC-Coastal Union)	1346 – Agreed.
6-1347	A	52	27			Should cite recent Science paper on this (and there have been several others post-tsunami in Nature and Science!): Danielsen F. et al. 2005. The Asian tsunami: A protective role for coastal vegetation. Science 310 (28 October): 643 (Susanne Moser, National Center for Atmospheric Research)	1347 – Rejected. Too obvious as we are trying to cut down the references.
6-1348	A	52	29		30	As I see it, climate change is not yet a daily issue for coastal practitioners because its likely effects are mixed with those driven by other processes; for their longer timescale effects (when compared to those for flood events and coastal erosion) climate change impacts, including accelerated sea-level rise and an increased frequency of strom surge ocurrence impacts, are often mentioned as potentially influencing in specific cases but cosidered as unknown or uncertain. In any case an integrated cross-sectoral aproach to coastal zone management, including strategical environmental assessment, accurate assessment of capital at risk, hazard and mapping risk, spatial planning, enhanced knowledge base of coastal processes and interactions, would provide a more effective and efficient response to climate change problems. (Luciana das Neves, Hydraulics and Water Resources Institute | Faculty of Engineer, University of Porto)	1348 – Agreed. Will incorporate where necessary.
6-1349	A	52	29	52	30	To be deleted (Yves Henocque, Department of Fisheries)	1349 – NA. See comment 1348.
6-1350	A	52	29		30	Needs extension and referencing (Susanne Moser, National Center for Atmospheric Research)	1350 – Agreed. See comment 1348.
6-1351	A	52	30	52	30	Add 'Although Bangladesh embraces a broader policy environment (in adopting Coastal Zone Policy and Coastal Development Strategy), investments to support this policy environment are lacking.' (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	1351 – Rejected. Too specific. See comment 1348.
6-1352	A	52	33	53	31	Comment on section 6.8: This section starts out reading like a section and then tapers off into items that look more like notes for possible development than like	

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						actual points being made. (Robert Buddemeier, University of Kansas)	
6-1353	A	52	33			This section could be improved substantially to highlight areas that are not-well covered in the current format of this chapter, but are very important. They are potentially the more complex issues to unravel, such as catchment-coastal links or land-use interface and how this links to other legislation, planning and policy changes to lead to more advanced human adaption to coastal climate change (beyond the coastal fringe), changes in governance, human adaptation and ecological impacts as well as the physical process impacts which are discussed at length. It is also weak on the need for LT monitoring using studies like Marclim (not currently cited) to illustrate the benefits of such data and freely available data - these are the types of things that policy and government need to have to make investments in reasearch and monitoring. This summary section could also be improved beyond a list form - some diagrams, synthesis material and/or grouping of key trends/needs would be more helpful than a list format. Very little coverage of the following areas in this chapter - uncertainty, vulnerability (e.g. Tsimplis et al. 2005. Phil trans Royal Society) ecological impacts, poor definition of coastal areas/boundaries, social side of adaption, non-model economics (e.g. Ledoux, Turner, etc) weak on governance, need to monitor, need to think across sectors and land use units (i.e. landward and marine dimensions affecting coasts as well as planning and legislative instruments). (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	Accept
6-1354	A	52	35		42	Better models on how coastal ecosystems will respond to climate change that can be used at relatively small scales as well as large scales. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Text radically altered to a small list of actions
6-1355	A	52	35	53	31	This list of "key uncertainties" is focused only on sea level rise, and does not consider a long list of other concerns about the effects listed several times above. Amongst other uncertainties would be the power of IPCC to advise city planners not to built further into the sea, but to retreat landward. (Gregg Brunskill, Australian Institute of Marine Science)	Text radically altered to a small list of actions
6-1356	A	52	35		37	and especially unconsidered observational facts that do not support the IPCC scenarios. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Text radically altered to a small list of actions
6-1357	A	52	35	53	31	general comment on chap 6.8 : this chapter is very important and could conduct next researches. It requires more development and need to be structured in differents sub-chapters as indicated in the title. Need to add information on uncertainties (such as extreme sea level -page 17-, on the lack of knowledge	Agree

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						concerning the change in intensity and frquency of storm, -p14-, spatial variability in sedimentationrate within mangroves -p24, line 32-, etc) (LENOTRE NICOLE, BRGM (French geological survey))	
6-1358	A	52	44	53	31	The list may change within the evolution of the draft. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	Text radically altered to a small list of actions
6-1359	A	52	44		44	Have merged: where ?? (Wim Salomons, Institute for Environmental Studies. Free University Amsterdam)	Text radically altered to a small list of actions
6-1360	A	52	44	53	31	This is a very important section of the chapter. It is porly written and replete with errors(eg. P 53 lines 9 to 14, lines 18 to 22 lines 25 to 28). It has be be more focussed and more clearly written. (Bhawan Singh, Université de Montréal)	Agree
6-1361	A	52	46			Suggest our understanding of how systems will respond is not concentrated on the natural systems but on physical systems, our understanding of how coastal ecosystems will respond (e.g. inshore fisheries, mangroves etc. is not well understood at all_ as well we have a poor understanding of the ecosystem services that will be lost. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Agree
6-1362	A	52	46	53	2	(1) A present-to-future sea leve rise is still a delicate issue. Whilst models (IPCC, 2001) redict a rise of +47 +-39 cm, observations predict +10 +/-10 cm (INQUA, 2000) or even +5 +/-15 cm (Mörner, 2004, 2005). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	WG1 issue
6-1363	A	52	46	53	31	Item 2, it is suggested that it is important to include analysis of governance and regulatory requirements, as well as climate change impacts, to support policy development. Item 4,it would be useful to extend the focus beyond delta to also include other vulnerable environments such as lagoons,estuaries and enclosed seas. Item 7, suggest resilience and appropriate regulatory and governance arrangements be considered as well. Item 11, suggest consideration of impact of extreme eventsw on economic, political, social and regulatory stability and institutions (within and external to nations, or at regional to sub-regional levels). (Magdalena Ariadne Kim Muir, Arctic Institute of North America (AINA), and EUCC-Coastal Union)	Text radically altered to a small list of actions
6-1364	A	53	1	53	11	Conclusion 5 refers to economic models and their development, but there is no reference to the TAR conclusion (see p6 line 6-7) that the effects on social and cultural systems need more attention. I would recommend a conclusion that refers to the work that has been done (such as on social impact analysis - see comment 1), and for the need for integrating it in climate change studies. (Maarten Bavinck, University of Amsterdam)	Agree

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6-1365	A	53	3	53	3	Duplicated 'are required' (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	Agree
6-1366	A	53	3		5	(2) The "anlyses of climate" do not include the effects of Solar variablity. If the long-term cyclicity (last 600 years) is considered, we are facing a new Solar Minimum around 2040-250 with a new Little Ice Age over northern Europé and the Arctics (Mörner; e.g. Report to the House of Lords). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	WG1 issue
6-1367	A	53	3			are required are required should be are required (John Ronde de, Rijkswaterstaat/ RIKZ)	Text radically altered to a small list of actions
6-1368	A	53	6		8	(3) Speculations not based on observation. Better await such data than start "painting the deth on the door". (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	WG1 issue
6-1369	A	53	6		8	That is the most wishful thinking in this entire chapter. It is COMPLETELY removed from reality and can be proven wrong countless time. Every single decision-maker I talk to says: give me projections over policy and planning or project-relevant timeframes (20-30-maybe 50 years), not even further out beyond 100 years, which is already irrelevant to them. I'd say, if you don't want to be laughed out of town by policy-makers, drop this 3rd point. (Susanne Moser, National Center for Atmospheric Research)	Noted
6-1370	A	53	6	53	8	Currently the level of knowledges about tendencies of natural processes evolution is not enough for realistic forecast of climate change and sea level rise before 2100 year, even more so beyond 2100. (Stanislav Ogorodov, Lomonosov Moscow State University)	Noted – but models do produce post-2100 trends
6-1371	A	53	9	53	10	It is stated that "Many large delta are increasingly threatened by sea level rise and climate change". The reader gets an impression that deltas are more vulnerable to the climate change. In fact, deltas are more vulnerable to sea level rise caused by subsidence. The senetnce needs to be rephrased. (Unnikrishnan Alakkat, National Institute of Oceanography)	Text radically altered to a small list of actions
6-1372	A	53	9	53	9	Agreed that a focus on vulnerable environments yields benefits. Why not add that a focus on the effects for various socio-economic categories would also be profitable? See comment 2 above. (Maarten Bavinck, University of Amsterdam)	Text deleted
6-1373	A	53	9	53	12	Modify the beginning of the sentence starting on line 9 to read as follows: "Many large deltas, ALREADY UNDER STRESS, WILL BE UNDER GREATER STRESS BECAUSE OF sea level rise…" (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Text deleted

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6-1374	A	53	9		13	(4) Yes, it is a tru environmental-social disaster. But all attention is now focused on global warming issues instead of real threts like earthquakes, tsunamis and volcanic eruptions, and events like hurricanes, extreme storms and local flooding. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Hard to respond to this
6-1375	A	53	12	53	12	Please rewrite: "A focussed programme that focussed on..." Repetition. (Leticia Cotrim da Cunha, Max-Planck-Institut für Biogeochemie)	agree
6-1376	A	53	14		17	(5) If the basic assumptions are unfounded, the output becomes meaningless. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Hard to respond to this
6-1377	A	53	17			this point should include something about appropriate and realistic ongoing management costs be included in the models (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Agree
6-1378	A	53	18			It is important that adaptation strategies should be, where possible, low-cost or cost-effective, or where the cost can be spread over many years. In a heavily indebted poor country, for example, these considerations are paramount.We should still have time, however, to develop and implement a number of sensible, affordable measures to reduce exposure. For example, we could look at the extent to which we could use zoning and planning regulations to gradually relocate infrastructure, enforce building codes to increase surviveability, establish evacuation plans, routes and shelters, or even build sea defences for critical sites. (Anthony Clayton, University of the West Indies)	agree
6-1379	A	53	18			Insert "current climate variability" between "impacts of" and "sea level rise". (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Text greatly altered
6-1380	A	53	18		24	in these two points you should bring out more clearly that better science-practice linkages are needed to facilitate this. (Susanne Moser, National Center for Atmospheric Research)	agree
6-1381	A	53	18	53	22	Comment on statement 6. I think it should be acknowledged that the line separating when adaption versus protection is most desirable is more based on political decisions and feelings than on cold fact being provided through scientific research and monitoring. (Morten Pejrup, Institute of Geography University of Copenhagen)	Greatly changed
6-1382	A	53	22			Also models that examine the trade-offs between strategies would be good too. (Jacqueline Alder, Fisheries Centre, University of British Columbia)	Greatly changed
6-1383	A	53	25		26	(8) Other studies should be included – like my own on the interaction of multiple parameters (Mörner, 1995, 2000, 2004, 2005a-b). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Not relevant here
6-1384	A	53	27	53	30	Points 9 and 11 do NOT emerge from the Chapter. There is no mention of poverty alleviation, food security or political instability.	Agree -- deleted

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Denise Reed, University of New Orleans)	
6-1385	A	53	29		30	(10) Yes, this is much more important than hypothetical model trends. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Thank you
6-1386	A	53	31			Study of worst case scenarios is also needed for effective long term planning. Many areas, like Venice, will eventually have to consider complete enclosure of the lagoon from the Adriatic Sea. This has already happened in the Eastern Scheldt, for example. The consequence for water quality, ecological adaptation etc. must be considered. Saeijs H L F and Geurts van Kessel A J M (2005) The Oosterschelde, a changing ecosystem after completion of the delta works in Fletcher C and Spencer T (Eds) Flooding and Environmental Challenges for Venice and its Lagoon: State of Knowledge, Cambridge University Press (Jane da Mosto, CORILA)	Agree
6-1387	A	53	31	53	31	(...) on economic, social, and political instability. (João Figueira de Sousa, Universidade Nova de Lisboa)	Agree
6-1388	A	53	31			I would like to add two further research topics: a) More understanding of the interdependancies of ecological services and functioning of the ecosystems in the coastal zones. B) More understanding of those processes and structures which support the adaptive capacity of the society on different scales. (Wilhelm Windhorst, Kiel University)	Deleted and simplified
6-1389	A	53	32	53	32	12. Importance to increase partnerships to promote the exchance of data and information and the development of monotorizing systems to improve coastal planning and management. (João Figueira de Sousa, Universidade Nova de Lisboa)	Deleted and simplified
6-1390	A	53	32			I would add: (12) Most important would be to consider others' opinions, especially those based on ferm observations. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Deleted and simplified
6-1391	A	53	33	53	33	13. Neds to increse the capacity for disaster prevention, and to develop specific disaster management and emergency programes for help populations afected by weather-related coastal hazards. (João Figueira de Sousa, Universidade Nova de Lisboa)	agree
6-1392	A	53		53		Add a new point ' Enhancement of policy and strategic environment to address the 'coastal zone' as distinct system within national and regional levels.' (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	Deleted and simplified
6-1393	A	54	0	78		Consistency in the way references are made is lacking (Luciana das Neves, Hydraulics and Water Resources Institute | Faculty of Engineer, University of Porto)	Deleted and simplified

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6-1394	A	54	1			References are nearly "shameful" (see general comments). The vast majority represents contributions from, what we may call, "the IPCC-family" itself. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	?
6-1395	A	54	1	78	8	Reduce to within 6 page (Qilun Yan, National Marine Environmental Monitoring Center)	Not possible
6-1396	A	54	19	54	19	Addition in the References: Agrawala, S., T. Ota, A.U. Ahmed, J. Smith and M. v. Aalst, 2003: Development and climate change in Bangladesh: Focus on coastal flooding and the Sundarbans. Organisation for Economic Co-operation and Development, 70 pp. (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	References checked and used if relevant
6-1397	A	54	49	54	49	…: Cairns, 1996 2000? (Bhawan Singh, Université de Montréal)	References checked and used if relevant
6-1398	A	60	13			This section could have more 'added-value' as expected by IPCC but advising on the need to review and consider climate change as part of exisiting policies and legislation and for research to examine how this can best be done. Some exampls of data/policy partnerships could also be added such as transboundary climate change adaptation panels such as between the east coast of canada and america and/or a new marine climate change impacts partnership in the UK (Larissa Naylor, Environment Agency & University of East Anglia, respectively.)	References checked and used if relevant
6-1399	A	63	23	63	23	Addition in the References: Iftekhar, M. S. and M. R. Islam, 2004: Degeneration of Bangladesh's Sunderbans mangroves: a management issue. International Forestry Review, 6, 123-135. (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	References checked and used if relevant
6-1400	A	63	27	63	27	Addition in the References: M. R. Islam (ed), 2004: Where Land Meets the Sea, A profile of the coastal zone of Bangladesh. University Press Limited, Dhaka. 317pp (Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	References checked and used if relevant
6-1401	A	67	48	68	4	Meehl et al., 2005 should come before Melillo et al, 2000. (Bhawan Singh, Université de Montréal)	References checked and used if relevant
6-1402	A	71	26	71	45	Problems with formatig/typing (Bhawan Singh, Université de Montréal)	References checked and used if relevant
6-1403	A	73	34	73	34	Addition in the References: Singh, O. P., T. M. A. Khan and M. S. Rahman, 2000: The vulnerability assessment of the SAARC coastal region due to sea level rise: Bangladesh case. SAARC Meteorological Research Centre Publication No. 3, 108pp.	References checked and used if relevant

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						(Rafiqul M. Islam, Program Development Office for Integrated Coastal Zone Management)	
6-1404	A	75	28			This paper is in press with Mitigation and Adaptation Strategies for Global Change. (Richard S.J. Tol, Uni. Hamburg)	References checked and used if relevant
6-1405	A	75	34			This paper is in press with Environmental Science and Policy. (Richard S.J. Tol, Uni. Hamburg)	References checked and used if relevant
6-1406	A	75	38			This paper appeared in 2003 in Risk Analysis, 23 (3), 575-583. (Richard S.J. Tol, Uni. Hamburg)	References checked and used if relevant