INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

WMO UNEP

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

Expert Review of First Order Draft

Specific Comments

Chapter 18

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**.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
18-0	A	0				**Co-chair and TSU comments** General comments This chapter needs to (but does not yet) assess literature on damages avoided (i.e. benefits) by differing amounts of mitigation (eg stabilisation). This is the only place in AR4 where such material is located. It is requested in the plenary-approved outline where the bullet point is: "Consideration of costs and damages avoided and/or benefits gained". There is literature on impacts under some stabilisation scenarios (eg 550 and 750 model experiments); and there are also SRES scenarios (the latter enable inference of impacts under some mitigation scenarios because A1B broadly = 750 ppm stabn parthway, B1 =550, and B2=650 (see Swart, Mitchell, Morita, Raper Global Envtl Change 12 (3) 2002); and there is the range of assessments for impacts at different T increments (see Warren paper in Exeter 2005 mtg book). Such an assessment would a) enable support of your assumption (that adaptation is inevitably required) by indicating what impacts would occur under moderate/large/very large amounts of mitigation. Again, there is lierature on this; b) then enable you to make some comparisons with benefits achieved by adaptation (the latter being covered in Ch17). Then c) you would have an evidence-based assessment of the current knowledge about the differing benefits achievable under adaptation vs. mitigation. At present this chapter only asesses the literature about the **theory ** of the inter-relationships between A and M; it does not evaluate the	Noted .Will do. Noted. Noted. Noted

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						literature on benefits where this exists(see for example OECD benefits project 2003; Social Costs of Carbon report 2005, etc) Also missing are other sections identified in the plenary-approved outline: "Timing issues: timing of outcome, including rates of change; time discounting". This was intended by Plenary to lead to some discussion of what is currently known about the different outcomes (especially benefits) achieved by earlier vs later actions on mitigation and adaptation. In the end you need to contribute to the wider questIon, put too crudely but it still needs to be answered: Would it be cheaper to adapt than to mitigate? Or in what mix A and M? And would this need to vary over time? I see Chapter 17 as addressing adaptation costs and damages avoided, whilst Chapter 18 examines damages avoided by mitigation and makes the comparison between the two. Chapters 17 and 18 need to liaise on this. There are very few CAs, reinforcing the impression that this chapter is not an extensive review of what is currently known, but a reflection of the views of the small team of authors. There is little connection with WG3 assessment. The virtual dialogue www set up at La Reunion at your request was supposed to facilitate dialogue with WG3; but it was barely used and consequenly been closed down. This draft does not address head on the issues identified by Plenary, which we wanted to take further by labelling as a cross-cutting theme and by devoting a chapter to it. Below are comments from M. Parry ON ZERO-ORDER DRAFT in January 2005, [with additional notes in square brackets indicating response to these made in FOD]	Noted. Will try. Will include more. Will make connection. Noted.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						GENERAL 1. This isn't really an assessment in the IPCC meaning of the word. Much of the text and conclusions are unsupported by reference to the literature in the current knowledge base. See, for example, Section 18.3 - almost no references in 5 pages. The text is too much like a statement of the authors' own views. Frankly, in its current state, this needs more attention than any of the other chapters: It needs a lot of reading and assessment of a wider recent literature by the authors (also see 11. below). The fundamental question is not clearly addressed and is not answered. This is: "What is the current extent of our knowledge about the relative roles that adaptation and mitigation might play in meeting the challenge of climate change?" By 'relative' is meant the trade-offs, synergies, mixes etc. and their status for different places, sectors/systems, scales, times and stakeholders. [This fundamental Q is still not addressed]	Noted.
						CONTENT 2. The current draft does not cover much of what Plenary requested in the outline (and was developed at the Marrakech and Potsdam meetings: see reports from these in the Green Book, LA1) [and still does not cover these]. The main omission, which it is crucial to make good, is a thorough assessment of the literature on damages avoided under different amounts of mitigation. There are now assessments using GCM stabilisation scenarios. there is also the range of SRES impact asessments	Noted.
						3. Weak or absent topics include: " Costs and benefits, damages avoided; " Mixes of strategies, trade-offs and synergies; " Uncertainties; " Gaps in knowledge and research; " Scale issues (e.g. is mitigation always global and adaptation always local?); " Timing issues (e.g. on adaptation buying time for mitigation and vice versa); " Different roles	Will include.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						and objectives of different stakeholders [[these topics are not adequately covered: especially : "Costs, benefits and damages avoided"; and "timing issues"]	
						4. Where is reference to literature which explores relative damages avoided (and costs) in specific cases by adaptation versus mitigation and combinations of these. Table 18.1 is key in this respect, since at the moment it is the main source of concrete information. However, the references are an eclectic selection, and there is no evidence of a systematic hunt through the literature. Some references are peripheral to adaptation and mitigation in climate change, e.g., urban food growing. It must be made clear how these inform the climate change debate. Not all papers are post-TAR. It would have been better organized by topic, with references used in support. Finally, how does Table 18 help in analysing the relationship between adaptation and mitigation? [literature on 'benefits' is still not assessed]	Noted
						5. Case studies and hard data are needed to support the conclusions [better on FOD]	Noted.
						6. The chapter overlaps significantly in the later sections on development and sustainability with Chapter 20. Sustainability is not an issue identified in the Ch 18 outline, but is the focus of Ch 20. Where sustainability becomes crucial to an assessment of A-M, its inclusion should be brief and linked to Ch 20 [has not been moved to ch 20]	Noted.
						7. The section on international agreements should be omitted or totally rewritten to clearly demonstrate its relevance to the chapter. This was the recommendation of the between-chapter session at LA1 Vienna. There is interest in discussing the Montreal Protocol as a special case,	Noted

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						since the objectives of the Protocol will work against Article 2 of UNFCCC [OK in FOD]	
						8. Once the additional material has been assessed, careful prioritising will be needed, in order to stay within page limits.	Noted
						9. The Executive Summary makes some clear points but how are they an advance on TAR (are they reinforcing TAR conclusions, or are they new)? More importantly, there is no evidence that these are conclusions based on a substantive assessment of the new literature.	Noted
						SPECIFICS 9. The schematics add little and could be combined into one summary figure	
						10. No footnotes, please.	Noted
						11. Regarding the lack of assessment of the literature (which is the crux of our comments), we suggest that you assess: a) the literature which includes both adaptation and mitigation (we agree that this is limited); b) the literature on damages avoided (and at what cost) by adaptation; c) the literature on damages avoided (and at what cost) by mitigation; d) then compare your assessment under b) and c) and add them to a). [Not done in FOD]	Noted.
						12. Much of this literature is at the local level (e.g. World Bank project assessments and NAPAs) and may not lend itself to any regional level or global assessment, largely because this is such a new and complicated topic.	Agree.
						13. However, to take a global topic and one which is not so new:	Noted. Will try.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						consider the trade-offs between near-term beneficial effects of higher CO2 especially in higher latitude agriculture vs damages from higher temperatures elsewhere (and especially beyond the near-term), which underlie the point of inflexion between net global gains and net losses in the Tol, Nordhaus, etc. calculations of global net effect of climate change; and you could do the same, where the literature exists, for specific regions and different sectors. [not done in FOD] 14. We suggest you broaden the author base by identifying CAs and their contributions. [only 2 CAs, the least of all chapters] **(Martin Parry)**	Noted. Will do.
18-1	A	0				This is a difficult chapter to put together because the literature is not mature and is very fragmented. Of necessity, the writing team has had to devise a conceptual framework within which to locate the material that they review. For this reason, parts of the chapter are more in the nature of "think pieces" as opposed to reviews. I think this is unavoidable, but it means that work will be needed over the next few drafts to tighten this up. Overall, I think an excellent start has been made. The authors introduce and use a few key concepts throughout the chapter. Examples are "adaptive capacity". "response capacity" "pro-active adaptation" etc. As in Chapter 17, it would be very useful to have a "concepts" section at the start of the chapter which sets out how the authors are going to use key terms. To re-iterate - a very good start on a difficult chapter. (Jim Skea, UK Energy Research Centre)	Noted.
18-2	A	0				This is a very vague chapter that doesn't clearly articulate the differences between adaptaiton and mitigation, nor their interactions. It lacks specificity, both in examples, and in the use of findings from the relevant literature--much of which is in the "grey" arena from project reports by various governmental entitites and research centers. I would begin with a clear definition of the concepts (mitigation and adaptation), follwed by a section on the temporal characteristics of each and the scale at which they operate. Once this is formulated, the remainder of the chapter could address constraints in decisionmaking, and impediments for implementation of adaptation and mitigation strategies. (Susan Cutter, University of South Carolina)	Noted.
18-3	A	0				This chapter is required to set stage to policy and measures formulations. Also, this is a	Noted.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						necessary step to involve stakeholders in decision making processes. However, a process of public participation and public awareness raising should be also put in place. (Savitri Garivait, The Joint Graduate School of Energy and Environment (JGSEE))	
18-4	A	0				Following are eleven references alluded to in the comments. Most are available from my home page at http://members.cox.net/igoklany/. I'll also be happy to send hard copies, if requested:: 1. Goklany, IM. 1995. "Strategies to Enhance Adaptability: Technological Change, Economic Growth and Free Trade." Climatic Change 30: 427-449. 2. Goklany, IM. 1998. "Saving Habitat and Conserving Biodiversity on a Crowded Planet." BioScience 48 : 941-953. 3. Goklany, IM. 1999. "Richer is More Resilient: Dealing With Climate Change and More Urgent Environmental Problems." In R. Bailey, ed., Earth Report 2000, Revisiting the True State of the Planet (New York, NY: McGraw-Hill), pp. 155-187. 4. 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. 5. Goklany, IM. 2000. "Potential Consequences of Increasing Atmospheric CO2 Concentration Compared to Other Environmental Problems." Technology 7S: 189-213. 6. Goklany, IM. 2001. The Precautionary Principle: A Critical Appraisal of Environmental Risk Assessment (Cato Institute, Washington, DC). 7. Goklany, IM. 2002. "Comparing 20th Century Trends in U.S. and Global Agricultural Land and Water Use." Water International 27: 321-329. 8. 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. 9. Goklany, IM. 2005. "A Climate Policy for the Short and Medium Term: Stabilization or Adaptation?" Energy & Environment 16: 667-680. 10. 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. 11. Goklany, IM. 2005b. "Integrated Strategies to Reduce Vulnerability and Advance Adaptation, Mitigation, and Sustainable Development," forthcoming.	Noted. Will consider.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Indur Goklany, Office of Policy Analysis, Department of the Interior)	
18-5	A	0				General Comment: The discussion about development pathways and other issues are very general and abstract, the chapter would benefit from addressing specific issues related to OECD countries and developing countries. Executive Summary: Bullet four is a too strong conclusion based on the few available studies and the very general discussion in the chapter. Bullet five is not really defended by available literature and the underlying discussion in the chapter. The response capacity concept is new to IPCC, so much more precise definitions are literature review is required. (Kirsten Halsnaes, Riso International Laboratory)	Noted.
18-6	A	0				URLs: The Governor of the State of California. 2005. Executive Order S-3-05. Available online at: http://www.dot.ca.gov/hq/energy/ExecOrderS-3-05.htm DEFRA. 2003. The Energy White Paper. Available online at: www.dti.gov.uk/energy/whitepaper/index.shtml European Environment Agency. 2004. Impacts of Europe's Changing Climate. Available online at: http://reports.eea.eu.int/climate_report_2_2004/en (Katharine Hayhoe, Texas Tech University)	Noted
18-7	A	0				The chapter seems to be rather negative about both the importance of, and the information on, the inter-relationships. There is a fair amount of repetition.It seems that the page count be trimmed substantially without losing anything vital. (Chris Hope, Judge Business School)	Noted.
18-8	A	0				The chapter is very interesting and the part related to trade-offs and synergies is the key part. The chapter lacks timing issues, probably due to the complexity of the topic. (Patricia Iturregui, Consejo Nacional del Ambiente)	Noted
18-9	A	0				GENERAL There is considerable scepticism about this topic. Many academics consdier that the links between adaptation and mitigation are very weak and therefore not really worth analysis. Do the authors agree or not? Do the authors think it is worthwhile to look for an optimal mix of adaptation and mitigation or do they think this is a meaningless exercise? GENERAL The authors are clearly struggling with a lack of suitable literature and are to be congratulated on the table of examples of interrelationships. What is also lacking is a convincing conceptual framework for the analysis of interrelationships, inspite of the various figures presented here. Would it be feasible to explain how the figure of clusters of interrelationships is derived from the table and link this to the general	Noted. Will try.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						concepts discussed earlier e.g. fig 18.2 decision making and development paths? (Jonathan Köhler, University of Cambridge)	
18-10	A	0				General comment: Overall, the first draft of the chapter is in good shape. The structure is good and most sections have set a good foundation for the next draft. (Neil Leary, International START Secretariat)	Noted.
18-11	A	0				It is notorious theregister of a very limited number of papers related to developing countries, which are supposed to be the most succeptable ones to the impacts of climate change. That is a clear signal that there is a lack of conscience about the potential impacts on human activities, or that the governments are not engaged in the effort to prepare the community to the impacts of climate change. Some discussion about this problem should be enphasized in that chapter, due the importance of the implementation and efficacy of adaptation programs in developing countries. (Magda Aparecida Lima, Brazilian Agricultural Research Corporation - Embrapa)	Noted. Agree.
18-12	A	0				Text seems rather premature in terms of style and arrangement (Stephan Lingner, Europäische Akademie GmbH)	Not clear.
18-13	A	0				Overall comments on Chapters 18. Chapter clearly shows evidence of scholarship, discipline and solid research. Chapter 18, as FOD, clearly shows more maturity. Placement of sections and specific emphases of critical aspects, concepts or definitions needs further reconsideration. (P. H. Liotta, Pell Center for International Relations and Public Policy)	Noted.
18-14	A	0				Thank you for the invitation to review the relationships between Ch17 and Ch18 for WGII. I will attempt to address the three questions below but must admit that I could not resist the opportunity to make a couple of comments on the chapters individually. 1. Complementary. Do the chapters contradict one another? 2. Concise. Are there overlaps between the two chapters? 3. Complete. Is all the necessary material assessed somewhere in these two chapters? In general both chapters are well written and do not substantially contradict or overlap. They also cover a wide range of the literature. (Diana Liverman, Oxford University)	Noted
18-15	A	0				One of the issues that I have not seen addressed in the impacts report, which might merit covering in this chapter are the impacts on countries resulting from impacts occurring outside their country or region. The world has become quite tightly coupled, so in several general ways and so what happens anywhere will affect virtually everywhere. The general categories that we identified in the US National Assessment (but did not really develop as the task was too big and it might well have seemed	Noted.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						presumptuous) were: (a) economic, market, and technology couplings and dependencies; (b) drawing upon shared resources like global fisheries, water shared between nations, migratory species, etc.; (c) health impacts, which matter to nations because visitors come in, but also because residents go to other places for business, pleasure, family ties, etc.: and (d) the issues of environmental refugees, disaster assistance, and family ties, etc. that make one country's citizens simply care about what happens elsewhere. With respect to this chapter, adaptation steps to help improve the health of those in other nations might be seen as helping improve the health of one's own nation, reducing resource demands on energy, etc.--a limited example, but there must be more, and IPCC does need to really start thinking more about these international types of connections and dependencies. (Michael MacCracken, Climate Institute)	
18-16	A	0				Chapter 18--second general point: It seems to me that societies will generally be considering the climate change issue in an integrated way with every other issue, and so this chapter should have early on considered the linkages of the climate change issue with development and sustainability issues. Doing so, it seems to me, would open up the potential for a lot more relationships between mitigation and adaptation and with other societal goals--and so make, on the one hand, steps to limit and adapt to climate change more likely and feasible, and on the other made clear the necessity of considering everything together so that steps taken in one area do not adversely affect another, or commit a nation to an economic or environmental step that they might soon have to reverse (e.g., taking US subsidies to build coal plants is not really a good idea as one might well have to reverse that step before the investment pays off). (Michael MacCracken, Climate Institute)	Noted.
18-17	A	0				Chapter 18 is a very nicely done chapter, and is indeed a useful addition to the set of IPCC chapters. The only general approach that I felt was underdeveloped was to consider the linkages by species. The chapter seems focused primarily on CO2 associations, but there are many that would arise with respect to soot, methane, etc. that merit consideration. The typical reason for focusing so much on CO2 is that the 21st century increment of CO2 forcing is so much more than the 21st century increment of forcing due to other species--but this represents a serious mistake in analysis. For CO2 and N2O and the halocarbons, which have long lifetimes, it is indeed the forcing increment during the 21st century that can be affected by mitigation. However, for methane, soot, other aerosols, etc., their short lifetime means that there is essentially no carryover of 20th century forcing into the 21st century, and one should be thinking about mitigating the total forcing from these substances, not	Noted.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						just the incremental forcing. This is the reason that Jim Hansen's strategy focuses so much on soot and methane--and it is also the reason that a sudden cutback in SO2 emissions leads to a very strong warming influence. While developed nations have pretty much limited (or are limiting) their methane and soot emissions, so for the future need to focus on their CO2 emissions, in the developing world this is not the case--a strong focus on the soot and methane emissions would help a lot with their air pollution as well as with the climate change commitment. So, because the projected emissions of either the developed nations alone or the developing nations alone would lead to unacceptable climate change, it might well be possible to strike a bargain where the developed countries do all they can on everything (especially CO2) and the developing nations do all they can on soot and methane (for reasons of efficiency, air pollution, etc.) and just commit to use efficient technologies in their use of CO2 so that their legitimate aspirations for development are not put beyond their economic reach. (Michael MacCracken, Climate Institute)	
18-18	A	0				General: this chapter needs a serious stock-take as it still seems confused and is not convincing. Perhaps it could start to get a focus by trying to decide in what contexts and for what purposes are adaptation and mitigation considered together? I suggest this is to determine priorities between the balance of effort and to ensure that synergies or conflicts are addressed. Who needs to know what to do this? Does this chapter yet provide the evidence to help? Indeed, is there this evidence and if not what surrogates can be used. Where precisely do interactions work, (good hits in my view are land management and the built environment.) The chapter would benefit from examining who is beginning to ask the questions on mitigation and adaptation outside the research community, for example, the UK Treasury has just set up an enquiry into the global economics of climate change will tackle some of these questions- the Stern review. I was under the impression that the interface with WG 3 on this issue had been addressed but that is not yet evident. I think the chapter overlooks the fact that there are policies which have climate policy benefits and also specific functions such as reducing air pollution for health reasons, and maintaining water quality- the concept of sustainable development is too crude a catch-all. (Merylyn McKenzie Hedger, Environment Agency)	Noted. Will make clearer.
18-19	A	0				A key economic aspect of policy responses to mitigation versus adaptation is to equate	Noted.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						the marginal costs of mitigation with the marginal cost of adaptation (and if possible the marginal benefit). Because of the nature of the costs of both mitigation and adaptation, it is clear that both approaches will be used. Even if it is not possible to easily equate marginal costs and marginal benefits, it would be sensible to equate the marginal costs of mitigation and adapation. As far as I can read, a statement of this type does not appear explicitly in the report yet it is fundamental. (see McKibbin W. and P. Wilcoxen (2003) "Climate Policy and Uncertainty: The Role of Adaptation versus Mitigation" in Living With Climate Change: Proceedings of a National Conference on Climate Change Impacts and Adaptation. National Academies Forum, Canberra (ISBN 1875618767). draft can be found at http://www.sensiblepolicy.com/download/aas4.pdf (Warwick McKibbin, RSPAS, ANU)	
18-20	A	0				The authors have worked very hard to create a conceptual framework, largely from scratch, to deal with interrrelationships between adaptation and mitigation. However, the chapter as it stands is very unfocussed, it not always being clear why examples or experiences are regarded as relevant to both adaptation and mitigation. There is also a lot of gross repetition, some of it verbatim. There are also problems with items missing from the list of references (e.g. Sperling) or referenced in odd ways (e.g. FRP, U) (John Morton, Natural Resources Institute, University of Greenwich)	Noted. Will make clearer.
18-21	A	0				This chapter, in many ways, is quite strong already. I especially like the clarity and strength of the take home messages in the executive summary (even if they will be quibbled with in the details). A few key general suggestions to imrove the chapter further can be summarized as follows: (1) in many places, this chapter is too generic, and would benefit greatly if it used more concrete examples and references to support its claims; (2) it is in several places in danger of slipping into advocacy - and thus should be carefully reviewed for normative/advocacy formulations; (3) the chapter avoids the abrupt climate change issue almost entirely, and maybe even some recent literature that tried to definie "dangerous interference with the climate system" - what - more specifically - does that literature say on the balance of mitigation and adaptation?; (4) the chapter could, in many places, tap into a much wider literature, e.g., on publications coming out of the IHDP core programs such as GECHS, IDGEC, and IT; (5) the chapter is currently quite heavy with examples from the tourism industry while other sectors seem far less highlighted. Can this balance be improved?; (6) the chapter could also make a stronger connection between the feasibility limits of adaptation, and how that links back to mitigation: if we find out that adaptation won't	Noted. Will make corrections.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						work, don't we have more incentive to try to keep climate change to a minimum? This point could be brought out more strongly, upfront in the Exec. Summary, too. (Susanne Moser, National Center for Atmospheric Research)	
18-22	A	0				I know that this is a first draft but in my view this chapter has a long way to go before it is an assessment of the interactions between adapatation and mitigation. Much of Section 18.3 is an interesting essay but is certainly not an assessment. 18.4 is still in its very early stages but it does not come to grips with the interactions between adaptation and mitigation and is very shallowly researched. 18.5 has its core elements missing. This makes it very difficult to comment on the chapter other than picking pieces of detail. (Ian Noble, The World Bank)	Noted. Will make clearer.
18-23	A	0				We are told in the beginning, "Adaptation is a necessity" Yes, for the "Committed Warming" due to past emissions. But there are the components of warming due to current and future emissions. Thus, the adaptation costs should have been treated in two or three separate components: committed burden due to lack of knowledge in the past and future burden due to lack of mitigation. If those who are supposed to mitigate do not do that, then their private costs are converted into public costs in terms of adaptation costs for all! Secondly, the distinction between poor and rich regardless of where they are needs to be made throughout the text. The less the rich mitigate, more the poor (wherever they are) have to adapt. We saw recently during hurricane Katrina that the poor in a rich country can also suffer just as much, if not more. This two-agent problem (rich and poor) should have been formulated from the beginning. Even if one considers future period where non Annex-1 countries may take some obligations, upper and middle class with cars and appliances (AC, refrigerator) will mitigate first and not the poor who eke out subsistence level living. It would be good to have more discussion on some of the options. (See C). But my concern is that unfortunately Fig. 18.4 seems to contain implicit assumption that there is a decision to chose between "adapt or mitigate" by a single agent. This assumption is too simplistic and wrong because "the decision" to adapt is not made by those who are adapting, but is forced upon them. We need two-body or two-agent models. I am afraid correcting for the two paradigms will require a lot of rewriting. (Jyoti Parikh, Integrated Research and Action for Development)	Noted. Will try.
18-24	A	0				The most glaring omission in this chapter is any reference to demand or to an assumed way of life/standard of living around which the viability of adaptation and mitigation measures is organised and implicitly defined. The result is a hidden but tremendously	Noted. Will try to address.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						important 'baseline' of normality implicit, for instance in expecations that demand for air-conditioning will increase. Nowhere is there place or scope to consider the possibility that adaptation and for that matter mitigation might involve CHANGING what people take to be normal, including, in this example, normal standards of comfort, but also tourism, etc. The focus on resources (energy, water etc.) obscures the fundamental point that in everyday life it is the services that matter (the provision not of water but of bathing, laundering etc. and not of energy but of lighting, mobility, 'comfort' and so forth. This is vital because these are culturally loaded and unevenly distributed concepts, that are also extremely dynamic. Their dynamism is of direct consequence for the relation between adaptation and mitigation - the theme of this chapter. For example, if new, less demanding, standards of thermal comfort are institutionalised, this will have a mitigative effect that is also crucial for the extent and nature of adaptive action. Most of the writing about adaptation and mitigation supposes purposive action. Mention should be made of the possibilities of unintended consequences, and of the unpredictable reaction to policy-based decision-making: after all it is the reaction that matters, not the policy. (Elizabeth shove, Lancaster University)	
18-25	A	0				There is good stuff in this chapter but it needs serious revision for consistency and logical flow of reading. Please make sure that all the quotations are acknowledged (Youba SOKONA, Sahel and Sahara Observatory (OSS))	Noted
18-26	A	0				General: interesting sections, but some parts address issues other than the adaptation/mitigation links and do seem to belong elsewhere in the report (e.g. Chapter 20) (Rob Swart, MNP)	Noted
18-27	A	0				Dear colleagues: Regrettably, this chapter needs extensive work before it would warrant being incorporated into the FAR. I note inconsistent styles between sections, some sections are very poorly referenced (pages 1-13 contain only 14 references); there are numerous subjective and prescriptive comments, duplicative material, and headings which are either none descriptive or poorly labeled. There may be very limited new information in the literature on some of the issues, if that is the case do not feel obligated to fill the page limit for this chapter. I also do not believe that you have tapped all the potential sources of information and that with a better structure sections you will be challenged to stay within your page limits. It is not without hope, however, as some sections are well written and contain useful information. See detailed comments.	Noted. Will try to address.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Dennis Tirpak, OECD)	
18-28	A	0				This chapter is in a reasonable shape. It is not quite up to date with the latest literature on the interactions of adaptation and mitigation. For instance, the chapter ignores that there are now model studies that estimate the effect of climate change on emissions; for instance Bosello et al. (forthcoming ERE, EcolEcon), Berrittella et al. (forthcoming Tourism Management), Hamilton et al. (GEC, forthcoming ClimRes), Fankhauser and Tol (REE). The whole issue of emission reduction and land use is omitted. The effect of different energy prices on adaptation is not discussed in depth. Maybe this is because the authors think that adaptation is independent of impacts (and hence climate change), but that would be a mistake. (Richard S.J. Tol, Uni. Hamburg)	Noted. Will try to correct.
18-29	A	0				Nowhere in the chapter is any use made of the Millennium Ecosystem Assessment insights, particularly the human well-being - Ecological services framework, would be extremely useful for understanding potential adaptation-mitigation synergies. In general, AR4 should make as much use of the MA as possible - THE MA and AR4 ARE COMPLIMENTARY products. (Henry David Venema, International Institute for Sustainable Development)	Noted
18-30	A	0				A model of decision-making - acting, learning, then acting - goes as a red threat throughout this chapter. It would be good to refer to the literature on organisational learning (for example Peter Senge). One aspect of interlinkages between adaptation and mitigation seems to be missing. This relates to the public perception of adaptation and mitigation measures. Tangible and visible adaptation measures are likely to increase the public understanding that climate risks are real and that mitigation measures are necessary too. Research needs to be done to evalute changes of perception. (Martin Welp, Potsdam Institute for Climate Impact Research)	Noted
18-31	A	0				Main impression on the chapter 18 is that is an "titled composition" but not a summarization of relative literatures. The CLAs and LAs expressed their ideas and the literatures were used to support their ideas. (Shaohong WU, Institute of Geographical Sciences and Natural Resource Research, CAS)	Noted
18-32	A	1	1	13	20	This point misses another main message that could be summarized effectively regarding the diversity and the differences between adaptation and mitigation - in terms of temporal and spatial scales involved, as well as the processes by which and persons by whom the decisions to mitigate or adapt will be made. (Katharine Hayhoe, Texas Tech University)	Noted. Will try to clarify.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
18-33	A	1	1	29	32	This is a rather weak point that could be strengthened through drawing in a main message that was missed, namely the need for probabilistic risk assessments and other decisionmaking strategies to evaluate the multiple costs and benefits of mitigation, adaptation and non-climate-specific sustainability. (Katharine Hayhoe, Texas Tech University)	Noted.
18-34	A	1	1	13	45	Most of the guidelines for the chapter are not reflected in the main messages. This may be a deliberate decision on the part of the authors, but in the executive summary there should be some place to briefly summarize the main topics of the chapter in addition to focussing on the most compelling results. (Katharine Hayhoe, Texas Tech University)	Noted. Will try to improve.
18-35	A	1	1	34	38	Here, rather than lines 18-20, is the place to mention the importance of scenarios in determining response capacities, since one of the primary methods discussed in the text to enhance response capacity is through projected development and sustainability decisions which are directly reflected by SRES and other socio-economic scenarios. (Katharine Hayhoe, Texas Tech University)	Noted.
18-36	A	1	1	13	45	A final main message that this chapter brings out very strongly but which is not represented in these summary points is the compelling link between sustainability and development, with the end goal being to reduce vulnerability. The important corollaries to this point are that decisionmaking on adaptation and mitigation must be expanded far beyond the boundaries of climate-related organizations (e.g., into the purview of current-day agriculture, energy, water, development agencies) and that a nation's internal and foreign policies must also be multi-faceted (addressing energy use and agriculture simultaneously rather than, for example, reducing GHG emissions from energy while simultaneously implementing ag policies that would allow ag-related GHG emissions to grow). (Katharine Hayhoe, Texas Tech University)	Noted
18-37	A	1	1	1	45	Executive summary: This is a very nice job of explaining the key points--clearer than many of the other chapters I have reviewed. (Michael MacCracken, Climate Institute)	Noted
18-38	A	1	22	1	22	To conform with the IPCC lexicon, I would urge avoiding use of the ill-defined word "may" and instead here using "is likely to" (Michael MacCracken, Climate Institute)	Noted. Will do.
18-39	A	1	29	1	32	As noted in the general comment, I would think that early on establishing a linkage to societal efforts to develop and pursue sustainability would open up a lot more possibilities for win-win (even win-win-win) options. That this might be the case, even if not considered until late in the current draft of the chapter, should be mentioned	Noted.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						here. (Michael MacCracken, Climate Institute)	
18-40	A	1	41	1	45	Just as an opening comment, it seems to me that the analyses are going to need to be done at a great many spatial scales, most importantly at the local scale to get people behind taking the step, but also out to the international scale for the good not only of the planet but of one's nation. (Michael MacCracken, Climate Institute)	Noted
18-41	A	2	0	2		The executive summary is too vague and doesn't communicate very much substance to the reader. In fact, I doubt if it would have much appeal to a general reader, let alone a policy person, as currently constructed. It would benefit, as would the entire chapter, from a series of specific examples or applications. (Susan Cutter, University of South Carolina)	Noted
18-42	A	2	1	2	45	Chapter 18, pg. 2, line 1-45: A strong executive summary. I note that the current discipline literature addresses three related factors: adaptation, resilience and vulnerability. To distinguish between adaptation and vulnerability is useful—and correct—in this chapter. But not to address the relationship of resilience to either adaptation or mitigation seems a central weakness of this chapter. (P. H. Liotta, Pell Center for International Relations and Public Policy)	Noted
18-43	A	2	1	45	50	The chapter would benefit from looking also at the potential for well-planned versus ill-planned combinations of mitigation and adaptation to impact on the very sectors which they are designed to protect from climate change either positively or negatively - for example if afforestation projects results in the destruction of natural ecosystems or are not based upon the use of native tree species (negative) compared to positive examples listed on p7 lines 2 to 4. p7 lines 13-16 needs examining in this light also - are these land uses changes detrimental to ecosystems? Also prevention of impacts helping adaptation (e.g. intact coral reefs and mangroves protecting coasts). Although these ideas are touched on in sections 18.4.1 I think they deserve mention in earlier sections of the chapter. (Rachel Warren, School of Environmental Sciences)	Noted. Will check.
18-44	A	2	1	45	50	Some mention of whether management of land use change as carbon sinks is detrimental to ecosystems needs to be mentioned. Also the option to preserve existing forest that would otherwise be cut down is also a miigation option. This needs to be mentioned. (Rachel Warren, School of Environmental Sciences)	Noted. Will do.
18-45	A	2	7	3	19	Expert Review: On the Executive summary and 18.1 Introduction; Expert Reviewer strongly suggests that "oil crisis" is more serious than levies and emission charges.	Noted.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						1) Instability of world oil supply in future evaluated by Colin J. Campbell and Matthew R. Simmons will make hard to take options for adaptation in various sectors and nations in both developed and developing countries. 2) IPCC Emission Scenarios (2000) should be revised using Peak Oil Scenarios. 3) For the options to adapt heat extreme, policies for community cooling should be necessary. (Mitsuru ANDO, Toyama University of International Studies)	
18-46	A	2	7	3	19	Expert Review: On the Executive summary and 18.1 Introduction; Expert Reviewer informs the necessity to write the activities of UN organizations and other international agreements and mechanisms: The following description should be inserted in the text. 1) Since global warming and anthropogenic fuel burning should strongly link with population growth and economic activities, it is necessary to adapt the scenarios of UN organizations especially UNFPA, UNIFEM, UNDP and UNICEF. 2) For the mitigation of local societies, it is essential to improve the educational situation in the residents and children. UNIFEM and UNICEF promote family planning for maintaining the reasonable family size in sustainable communities. (Mitsuru ANDO, Toyama University of International Studies)	Noted.
18-47	A	2	8	2	9	How are you sure that no mitigation effort will prevent climate change from happening in the next few decade (Youba SOKONA, Sahel and Sahara Observatory (OSS))	Will be corrected.
18-48	A	2	10			The social and economic costs of mitigation will be even higher. (Hans H.J. Labohm, Netherlands Institute of International Relations 'Clingendael')	Noted
18-49	A	2	10	2	10	Suggest replace "could" with "is very likely" or "is likely" according to whatever degree of uncertainty can be agreed upon within IPCC using the appropriate term (Rachel Warren, School of Environmental Sciences)	Noted. Will correct.
18-50	A	2	11			Add to the end of this para: "For the next few decades, adaptation may be the most cost-effective method to reduce damages from CC, even if in the long term mitigation may be inevitable." {Goklany 2003, 2005). References are provided at the end of these comments. (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted.
18-51	A	2	11			social, economic and environmental costs (Rob Swart, MNP)	Noted.
18-52	A	2	13		20	Sole comment on a well-written chapter. It would seem that, practically speaking, adaptatation and mitigation might also be interrelated through country budget constraints; the more that is spent on mitigation the less available for adaptation (and for other things). I recognize this is arguable since both might be invested in till returns just equal costs, but practically speaking spending on the one likely will	Noted.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						impose some limit on how much is spent on the other. (Michael Canes, Logistics Management Institute)	
18-53	A	2	13	2	20	There are additional connections between adaptation and mitigation that are important and warrant consideration for highlighting in the executive summary. Climate change may have substantial impacts on the performance of some energy strategies for mitigation, e.g. hydropower, biofuels, wind power. How these strategies are implemented may need to be adapted for changes in climate. Climate change is also likely to have substantial impacts on efforts to sequester carbon in vegetation and soils. Efforts to sequester carbon will need to be adaptable to changes in climate if they are to be viable for long-term storage of carbon. (Neil Leary, International START Secretariat)	Noted.
18-54	A	2	13		20	I find the fact that they are both subject to negotiations to be a somewhat peripheral issue. The are also related because by virtue of technological choices and national policies that relate to water, energy and other natural resource management, neither of which are mentioned (Dennis Tirpak, OECD)	Noted
18-55	A	2	14	2	15	Sentence needs further explanation: in what context can adaptation be viewed as avoiding dangerous climate interference? Does this apply only to impacts on human systems or also natural systems? (Tom Kram, MNP-RIVM)	Noted
18-56	A	2	14			It is not clear how adaptation might contribute to prevent dangerous anthropogenic interference with the climate system (whatever that may be). Therefore, it is not clear what trade-offs and synergies will be. (Hans H.J. Labohm, Netherlands Institute of International Relations 'Clingendael')	Noted. Will clarify.
18-57	A	2	14	2	16	As shown by Tol and Dowlatabadi, mitigation may increase vulnerability to climate change. As shown by West and Dowlatabadi, adaptation may increase impacts of climate change. How can you conclude that adaptation and mitigation contribute to avoiding danger? (Richard S.J. Tol, Uni. Hamburg)	Noted. Will address.
18-58	A	2	16			Adaptation is mostly a local, regional or national affair. Mitigation is not on the negotiating table any more, at least as far as the follow-up of the current European mini-Kyoto is concerned. (Hans H.J. Labohm, Netherlands Institute of International Relations 'Clingendael')	Noted.
18-59	A	2	18			The linkage to development pathways is a truism. (Hans H.J. Labohm, Netherlands Institute of International Relations 'Clingendael')	Noted.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
18-60	A	2	22			See comments above. (Hans H.J. Labohm, Netherlands Institute of International Relations 'Clingendael')	Noted.
18-61	A	2	23			Add "and sustainable development" to the sentence in bold, so that it reads: "…effective implementation of climate policy and sustainable development" (Goklany 2005b, 2005c). (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted.
18-62	A	2	23		25	Meeting multiple objectives also broadens markets.. (Dennis Tirpak, OECD)	Noted
18-63	A	2	25			Modify the parenthetical statement to read: "…(e.g., by developing synergies between adaptation, mitigation, and sustainable development)…" (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted
18-64	A	2	26	2	28	It is not clear what is meant by "an exclusive focus on synergies may lead to essential options without synergetic effects being overlooked" (Patricia Iturregui, Consejo Nacional del Ambiente)	Noted
18-65	A	2	26	2	10	"could" should be replaced by a stronger word such as "will more probably lead" (Patricia Iturregui, Consejo Nacional del Ambiente)	Noted
18-66	A	2	26	2	27	Change wording to "an exclusive focus on synergies may identify essential, no-regret options". Adding "without synergistic effects being overlooked" seems unnecessary. (Rachel Warren, School of Environmental Sciences)	Noted
18-67	A	2	29		32	I do not see any in depth support in any of the rest of the text to support this rather provocative conclusion in the executive summary. This section of the report should be deleted. (John Richard Drexhage, International Institute for Sustainable Development)	Noted. Will check.
18-68	A	2	29	2	32	I would not agree with the header sentence. A broad approach to advancing sustainable development would also advance the ability to adapt as well as mitigate CC. That such an approach would provide benefits for both is not born out of serendipity, but out of a systematic approach to increase the resiliency of society. A second approach would be to address current, urgent climate-sensitive problems that could be exacerbated by climate change. This approach would clearly reduce vulnerability to CC, but its benefits for mitigation are, arguably, more serendipitous. (Goklany 1995, 2005b, 2005c) (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted. Will check.
18-69	A	2	29			This paragraph is inconsistent with the two previous paragraphs. (Hans H.J. Labohm, Netherlands Institute of International Relations 'Clingendael')	Noted. Will clarify.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
18-70	A	2	29	2	32	1. I am not convinced that the fourth message on p 2 (29-32) is justified by the review. I don't think the research is there to justify the conclusions (Diana Liverman, Oxford University)	Noted. Will clarify.
18-71	A	2	29		32	I am not sure I understand what your take home message is here. (Susanne Moser, National Center for Atmospheric Research)	Noted. Will clarify.
18-72	A	2	29			add finding about trade-offs (mitigation witrh adverse effects on adaptation and conversely) (Rob Swart, MNP)	Noted.
18-73	A	2	29		32	This conclusion seems to contradict the previous one. (Dennis Tirpak, OECD)	Noted. Will clarify.
18-74	A	2	29		32	There is no literature to support the prominence of the "Response Capacity" in the exec summary and in the chapter in general. It's a fine research idea, but immature for AR4 purposes. A more accurate reflection of the chapter would be to say instead, "One way of promoting both adaptation and mitigation would be to pursue Sustainable Development pathways, particularly those consistent with the Johannesburg Plan of Implementation for achieving SD. (Henry David Venema, International Institute for Sustainable Development)	Noted.
18-75	A	2	29		32	The depth of analysis presented DOES NOT justify this statement, which by the way essentially contradicts the results of the Millenium Ecosystem Assessment, which argued that use of economic instruments for ecological goods and services payment (INCL. carbon sequestration) was essential to reduce environmental vulnerabilities including those exacerbated by climate change. This review is too shallow, particularly wrt the development/ecosystem/agronomic literature to justify this statement. Basically this chapter lacks a strong Sustainable Natural Resources Management focus, which was present in previous IPCC LULUCF work that suggested much more potential for M-A synergies. (Henry David Venema, International Institute for Sustainable Development)	Noted. Will check.
18-76	A	2	29	2	32	I find this hard to believe. Designing buildings such that they insulate people from heat and cold resulting from changing temperatures also ensures that they are energy efficient. This is a mitigation and an adaptation option in a single step and must be highly beneficial. It cannot be called serendipitous. (Rachel Warren, School of Environmental Sciences)	Noted
18-77	A	2	34	2	38	Sugegst to drop this message: meaningless in any practical sense. (Tom Kram, MNP-RIVM)	Noted. Will clarify.
18-78	A	2	34			There is, however, a lot of empirical information how some nations, including the	Noted.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						Netherlands, coped with water threats. (Hans H.J. Labohm, Netherlands Institute of International Relations 'Clingendael')	
18-79	A	2	34	2	35	The Executive Summary is interesting but not underpinned well by the material in the chapter. This statement about “enhancing society’s response capacity” in the context of mitigation and adaptation really means having the political will to get things done. (Merylyn McKenzie Hedger, Environment Agency)	Noted. Will clarify
18-80	A	2	34	2	35	The second sentence admits that the first sentence is empty, as response capacity is undefined. Anyway, the best way to improve adaptation is by development, which most likely means higher emissions. (Richard S.J. Tol, Uni. Hamburg)	Noted. Will clarify.
18-81	A	2	34	2	38	I would have thought it was fairly clear that one could increase society's response capacity by investing in research and application of new technolgies for mitigation and adaptation, which would reduce the costs of both. This is outlined also on page 8 line 9 (option 3) (Rachel Warren, School of Environmental Sciences)	Noted.
18-82	A	2	38			define response capacity here and explain that it varies between and even within societies and nation states. The capacity to respond to different climate-related issues is also likely to vary. (Elizabeth shove, Lancaster University)	Noted. Will clarify.
18-83	A	2	40		45	Extremely simplistic understanding of the dynamics and complexities of adaptation and mitigation. The capacity to do exhaustive, empirical research on mitigation and adaptation sectors does not mirror how large and complex such a project would be. There is no such thing as a 'mitigation' or 'adaptation' kind of prototype as these statements would imply. Each case, and each particular activities, would provide a diffferent set of answers. The search for some ultimate solutions providing a clear 'unbiased' (?) analytical tool is naive. (John Richard Drexhage, International Institute for Sustainable Development)	Noted. Will clarify
18-84	A	2	40			This paragraph is somewhat inconsistent with the more optimistic statements in the previous paragraphs. (Hans H.J. Labohm, Netherlands Institute of International Relations 'Clingendael')	Noted. Will clarify
18-85	A	2	40	2	45	The notion that insuffcient information is available for policymakers ignores the role of markets in generating and internalizing the need for information. If a price is placed on carbon and markets are created to trade in carbon rights generated by mitigation then the marginal cost does not necessarily need to be observed by policy makers as it	Noted.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						will be individually calculated by market participants in making trading decisions. That is why markets either operating with a fixed emission target and minimizing marginal costs or the government setting a marginal cost of emissions and letting the market produce an emissions outcome, might be more efficient that collecting information for command and control of emissions by governments. The report seems to downplay the role of markets and market signals in both mitigation and adaptation policies (again see the paper above) but focusses centrally on planning by governments around an explicit target and timetable approach. (Warwick McKibbin, RSPAS, ANU)	
18-86	A	2	41		41	Here, and in a number of places throughout the chapter, you use the phrase "pursuing inter-relationships between mitigation and adaptation" (a little later, you use thr phrase "the desirability of inter-relationships" - this is not only linguistically awkward, I would argue, it's not clear what it means. Can you unpack that; search the whole document for this kind of phraseology and replace it with something more meaningful, more specific? (Susanne Moser, National Center for Atmospheric Research)	Noted.
18-87	A	2	42	2	42	What is "unambiguous guidance on [the] desirability"? Are you telling people what to think and feel? (Richard S.J. Tol, Uni. Hamburg)	Noted
18-88	A	2	46			The summary misses the most important point, namely that adaptation and mitigation are substitutes, not complements. (Richard S.J. Tol, Uni. Hamburg)	Noted. But do not necessarily agree. Can be both.
18-89	A	2	47			Your conclusions make no mention of differences between adaptation and mitigation. There is also no mention of institutions, policies, financing and other topics treated in sections 18.3-5. (Dennis Tirpak, OECD)	Noted. Will include.
18-90	A	3	0	3		Need to highlight the temporal domains for adaptation and mitigation and the scale that is most appropriate for each. (Susan Cutter, University of South Carolina)	Noted. Will do.
18-91	A	3	1	4	28	The authors are to be congratulated on this introduction, which is exceptionally lucid. (Katharine Hayhoe, Texas Tech University)	Noted.
18-92	A	3	2	3	4	No industrialized countries committed under UNFCCC to stabilizing greenhouse gas emissions at 1990 levels by the year 2000. What they committed is “--- to adopt national policies and take corresponding measures on the mitigation of climate change ---.“ (Article 4.2(a). (Mitsutsune Yamaguchi, Teikyo University)	Noted.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
18-93	A	3	4			Section 18.1.1 It seems that the two basic issues - trading off adaptation and mitigation in a cost-benefit framework and complementarities and synergies between mitigation and adaptation - are key here. I would highlight this point a little more (Jim Skea, UK Energy Research Centre)	Noted. Will try.
18-94	A	3	4	3	4	I wonder if it make sens to refer to the commitment of some industrialised countries to stabilise the GHG emissions at 1990 levels by the year 2000 (Youba SOKONA, Sahel and Sahara Observatory (OSS))	Noted.
18-95	A	3	5	3	5	I thought it was the average that was 5%, for a number of countries (like Australia) were allowed increased emissions. (Michael MacCracken, Climate Institute)	Agree. Will correct.
18-96	A	3	7	3	10	Important to also note here that the measures called for in the Kyoto Protocol would come no where near what it would take to stabilize concentrations of ghgs in the atmosphere. (Neil Leary, International START Secretariat)	Noted. Will clarify
18-97	A	3	12	3	19	In my view, this statement is in fact fair - both mitigation and adaptation have become essential in reducing the risks of climate change and there successful adoption and implementation depends to the extent to which these responses are integrated with relevant developent priorities. (John Richard Drexhage, International Institute for Sustainable Development)	Noted. Will clarify
18-98	A	3	12			Add to references: Goklany (1995) (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted. Will consider.
18-99	A	3	12	3	19	This paragraph betrays a northern bias. As expressed in the Delhi Declaration, for the south the issue has always been about adaptation (insofar as adaptation is synonymous with their SD objectives); mitigation is of interest only to the extent that it equates with their needs to expand energy services. (Henry David Venema, International Institute for Sustainable Development)	Noted. Will clarify.
18-100	A	3	13			"limits" or "barriers"? (Ian Noble, The World Bank)	Noted. Will clarify.
18-101	A	3	15	3	15	Suggest replace "could" with "is very likely" or "is likely" according to whatever degree of uncertainty can be agreed upon within IPCC using the appropriate term (Rachel Warren, School of Environmental Sciences)	Noted. Will clarify.
18-102	A	3	16	3	17	It would really help the reader to explain the example cited in the parenthetical expression rather than simply provide a listing of papers. (Michael MacCracken, Climate Institute)	Noted. Will try.
18-103	A	3	16		16	add "environmental - to the list of costs	Noted.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Susanne Moser, National Center for Atmospheric Research)	
18-104	A	3	17			The three cited studies do not look into sea level rise, but into extreme sea level rise. (Richard S.J. Tol, Uni. Hamburg)	Noted. Will clarify.
18-105	A	3	19	3	19	In this section "the risks of climate change" are directed primarily to the socio-economic changes that may accompany decisions to mitigate and or adapt to climate changes from the long term (in human perspectives) norms of weather, seasonal effects, and increasing productivity. Mitigation may modify the rate or extent of GCC but adaption seems to be more focused on human comfort and well being. The distinction should be clarified in this section so that it is apparent that it is the human impact that demands both mitigation and adaption. While aspects of the environment may benefit from adaptive measures, that benefit is still primarily directed at human needs. Mitigation efforts may benefit the existing environment, including man. (Suzanne Bolton, National Marine Fisheries Service/NOAA (ST7))	Noted. Will clarify
18-106	A	3	19			Add the following sentence at the end: "Arguably, adaptation is more cost-effective in the short to medium term, evan as mitigation is inevitable in the longer term (Goklany (2003, 2005, 2005b)". (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted. Will consider.
18-107	A	3	19	3	19	I would suggest changing "risks" to "expected impacts" to make it clear that there will be impacts, and there is not any real chance of escaping important impacts. (Michael MacCracken, Climate Institute)	Noted.
18-108	A	3	24	3	31	adaptation has been regarded as direct damage prevention and mitigation as indirect damage prevention. See page 43 of "Climate Change Damage and International Law" (2005) Roda Verheyen Martinus Nijhoff Publishers Leiden/Boston (Patricia Iturregui, Consejo Nacional del Ambiente)	Noted.
18-109	A	3	24	3	26	Explain better how to interpret this statement, e.g. climate change is of less threatening if adaptation possibilities exist (but also if exposure and/or sensitivity are reduced). (Tom Kram, MNP-RIVM)	Noted
18-110	A	3	27	3	29	the Brazilian proposal submitted on 1997 linked mitigation and adaptation to some extent (FCCC/AGBM/MISC.1/Add.3 (Patricia Iturregui, Consejo Nacional del Ambiente)	Noted
18-111	A	3	27			Scholars (or academics) and negotiators (or policy makers) are referred to on several occasions, but practitioners and actual practice get very little consideration in this chapter. (Ian Noble, The World Bank)	Noted
18-112	A	3	28	3	28	I would suggest saying "have policymakers" rather than the reverse.	Noted

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Michael MacCracken, Climate Institute)	
18-113	A	3	29			2. p3 line 29 – expansion is wider than to forests from energy policy especially the case of methane capture from waste and HFC which are very significant to CDM (Diana Liverman, Oxford University)	Noted
18-114	A	3	30	3	32	A more clear statement, is "the capacity to mitigate, adapt or simultanously mitigate and adapt is a function of development choices, and choices consistent with sustainable development principles are more likely to produce synergistic mitigation and adaptation benefits". (Henry David Venema, International Institute for Sustainable Development)	Noted
18-115	A	3	33	2	34	"Climate policy" on the adaptation side seems to be interpreted very narrowly here. Where I work it falls within long established agendas on flood risk management and water resource planning. (Merylyn McKenzie Hedger, Environment Agency)	Noted
18-116	A	3	33			There certainly has been considerable attention at the international level in the UNFCC process to sinks since 1997 and by the IPCC which devoted a special report to the subject. Section 18.4.2 identifies recent COP decisions relating to adaptation, suggesting substantial interest in adaptation over the last4-5 years. (Dennis Tirpak, OECD)	Noted
18-117	A	3	37	3	39	Among the wide range of options the report should mention: increasing energy efficiency, urban planning and transport policy. (Martin Welp, Potsdam Institute for Climate Impact Research)	Noted
18-118	A	4	1			Add a new sentence at the end as follows: "Synergies are also created when measures to reduce vulnerability to existing climate sensitive problems also advance the ability to cope with CC, and/or advance sustainable development (and vice versa) (Goklany (2005b)" (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted
18-119	A	4	1	4	1	Add example or refer to respective section (Stephan Lingner, Europäische Akademie GmbH)	Noted. Will try.
18-120	A	4	3	4	10	18.1.1, pg. 4, lines 3-10, final paragraph: Do not wait until the final paragraph of a section to emphasize that the literature of the inter-relationship between adaptation and mitigation is small. This recognition is critical and must receive emphasis—from the beginning. (P. H. Liotta, Pell Center for International Relations and Public Policy)	Noted.
18-121	A	4	3	4	10	there is a larger literature - see reference above (Warwick McKibbin, RSPAS, ANU)	Noted. Will include.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
18-122	A	4	3	4	10	The review of the development and agronomic literature (esp. rural developing world) is inadequate to say that the "available" lit on inter-relationships is reviewed. The relevant literature is small only if you require that it use the terms "mitigation" and "adaptation". A good example is Pimental et al (July 2005 Bioscience: http://www.terradaily.com/news/farm-05c.html). Nowhere in Pimental's paper are the terms "adaptation" or "mitigation" used, yet the substance of the paper is a crystalline example of M-A synergies . Further gaps : no FAO literature or IDRC ecosystem research (!) I would also urge the author's to examine the work of N. H. Ravindranath, however be forewarned neither adaptation nor mitigation may appear in the key words. Furthermore, since this chapter topic was not part of the TAR, the authors must consider and re-interpret older literature (including grey) that document operational scale linkages and synergies, AND consolidate the anecdotal references to M-A linkages from earlier IPCC work (Henry David Venema, International Institute for Sustainable Development)	Noted.
18-123	A	4	3	4	10	Important examples of M-A linkages from previous IPCC work that should be consolidated in this chapter (since this topic did not previously exist as a stand-alone chapter). Agroforestry (Syspro project): http://www.grida.no/climate/ipcc/land_use/290.htm Rural Bioenergy and Community-based Natural Resource Mgmt: http://www.grida.no/climate/ipcc/land_use/285.htm This is basic and essential material for this chapter. (Henry David Venema, International Institute for Sustainable Development)	Noted.
18-124	A	4	4			Define "small". There is a sizeable literature on cost-benefit analysis, which is about trade-offs between adaptation and mitigation. (Richard S.J. Tol, Uni. Hamburg)	Noted. Will clarify.
18-125	A	4	5	37	8	Much of this valuable information (direct comparisons and contrasts between adaptation and mitigation) could be more easily processed if it were summarized as a table within the box (Katharine Hayhoe, Texas Tech University)	Difficult to envision such table. Xox started as a simply summary of key similarities, differences, linkages. Now it includes many special cases/exceptions and more will come..
18-126	A	4	6	4	6	I would suggest changing "desirable" to "possible, much less desirable" (Michael MacCracken, Climate Institute)	
18-127	A	4	8	4	8	Change "does not only assess" to "not only assesses" (Michael MacCracken, Climate Institute)	
18-128	A	4	15	5	24	Box 18.1 it does not have a source or reference, not clear from where the definitions are coming from (excepting of course lines 31 to 35) The phrase at line 43 page 4 "The costs of mitigation arise locally while its benefits are dispersed globally" is inadequate, we are dealing with the issue of climate change damage, a global problem	Sources: TAR WGIII Ch10, etc. specified The sentence is correct, irrelevant who causes the problem – no change. Averted damage (nor risk) and residual

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						caused by countries with high level of emissions. The notion of climate change damage (risk and residual damage) is absent. Concerning adaptation it must be said that there are significant losses that are unable to avoid through adaptation, e.g. Antarctic ice sheet melting. (Patricia Iturregui, Consejo Nacional del Ambiente)	damage can be added. ADDED. Impossibility of adaptation → link to mitigation can be added. IRRELEVANT.
18-129	A	4	15	7		While I note the instructions to authors to briefly recap important information from previous IPCC reports, I think 4 pages are totally excessive. Why can't this be boiled down to a page? (Dennis Tirpak, OECD)	Summary is little over 2 pages, approx the agreed target. Real value would emerge if rest of the chapter referred back here and focused on "what's new". No action.
18-130	A	4	28	4	50	Why not use the language that economists have used for ages external and internal costs and benefits? Several of the points in Box 18.1 could be made more clearly by using these concepts more explicitly. (Neil Leary, International START Secretariat)	Agree in principle, but such formulation would immediately trigger a dozen "do not use jargon" comments. No action.
18-131	A	4	29			Box 18.1 I would take the material out of the box and make it part of the main text. (Susan Cutter, University of South Carolina)	Why? Reason for box should be stated though: definitions, key linkages, etc. Sec 18.1.2 now refers to the box and emphasizes that the intention is not to capture all special cases and exceptions..
18-132	A	4	29			Box 18.1: very instructuve, but could be structured along differences in spatial and temporal scale, in primary stakeholders, in institutional settings, etc. (Tom Kram, MNP-RIVM)	Agree: could be. But: mandate here is to summarize similarities/differences and key linkages. No action.
18-133	A	4	29			18.1.2, Box 18.1: There is no data on U.S. failures in both adaptation and mitigation—yet Chapter 20 does emphasize aspects of these failures These failures must be highlighted, as U.S. "failure impact" will have the greatest system effect. (P. H. Liotta, Pell Center for International Relations and Public Policy)	This is a definition/introduction/conceptual box. No data. No action.
18-134	A	4	29	5	24	It would be better to show this concept by drawing figures.. (Mitsutsune Yamaguchi, Teikyo University)	Not clear how. No action.
18-135	A	4	37	4		This para should be modified to reflect a few additional considerations: First, there are some adaptations that are best agreed on multilaterally, e.g., (a) reduction in agricultural subsidies in the developed countries that retard economic growth in developing countries, thereby retarding advances in the latter's adaptive capacity or (b) lowering of trade barriers (Goklany 1995, 2005b). Second, mitigation reduce all the impacts of CC, whether they are positive or negative, whereas adaptation allows for a more selective approach whereby one cashes in on the benefits while (trying to) stave of the negatives (Goklany 2005b). Third, the time delay between costs incurred and benefits accrued which favors adaptation over mitigation in the short to medium term	Although the idea was to summarize the key aspects and linkages and not to go into fine details and special cases, 2 and 3 ADDED. 1a and 1b might be justified by many other reasons, CC adaptation is of lesser concern here.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						is further accentuated if discounting is used (Goklany 2003). (Indur Goklany, Office of Policy Analysis, Department of the Interior)	
18-136	A	4	37			Another important difference: the effectiveness of different mitigation measures can for the most part be measured in a common unit: carbon equivalents. But how does one compare the effectiveness of an early warning system for a glacial lake outburst to that of a program to promote use of more heat tolerant variety of maize? (Neil Leary, International START Secretariat)	Added.
18-137	A	4	38	4	38	Suggest alter "meaningful mitigation" to "effective mitigation" (Rachel Warren, School of Environmental Sciences)	OK
18-138	A	4	40	4	40	“Local, regional or national” should be modified to “local national, regional”. (Mitsutsune Yamaguchi, Teikyo University)	No.
18-139	A	4	49	4	50	Explain the mitigation does have ancilliary benefits in reducing local and regional air pollution and that this is realised in the near term. These benefits can be extremely substantial and provide benefits of mitigation on a timescale comparable to that of adaptation. Cross reference WGIII Ch 3. (Rachel Warren, School of Environmental Sciences)	OK
18-140	A	4		5		Comment on Box 18.1: Should also note that: (a) adaptation and mitigation are linked by the fact that many of the determinants of adaptive capacity and mitigative capacity are common, and the factors underlying these determinants (or the determinants themselevs) are indicators of sustainable development. Thus it might be possible to make progress on all three fronts -- adtive capaciy, mitigative capacity and sustainable development -- simultaneously (Goklany 2005b). (b) Greater adaptation means lower mitigation and, possibly, lower targets and/or slower timetables for stabilization [Goklany (1999)]. (Indur Goklany, Office of Policy Analysis, Department of the Interior)	a) common determinants of capacity added but the chapter demonstrates the many trade-offs and relatively few synergies between AM. b) is not clear: lower mitigation implies higher targets; basic point added
18-141	A	5	1	5	4	Box 18.1 those asymmetries are not precise, adaptation is also driven by international agreements, even the case that UNFCCC does not have much progress as on mitigation. (Patricia Iturregui, Consejo Nacional del Ambiente)	Disagree: A by international agreement will be rare exceptions, e.g., in managing global commons affected by CC like ocean fisheries. No action.
18-142	A	5	1	5	20	18.1.1, pg. 5, lines 1-20: An arbitrary and artificial distinction is created here. To suggest that mitigation requires rigorous implementation measures while adaptation is driven by public policies and private actors is not supported by the justifications given. (P. H. Liotta, Pell Center for International Relations and Public Policy)	Disagree, but justification improved.
18-143	A	5	1	5	6	It is simplistic to say that adaptation is largely carried out by private actors, or fostered by self-interest: this applied much more to adaptation to climate variability than to	Disagree: what’s the difference for affected entity? When it starts raining, I will use my

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						climate change (John Morton, Natural Resources Institute, University of Greenwich)	umbrella no matter whether the rain is caused by climate variability or change. No action.
18-144	A	5	1		8	Box 1: Mitigation is driven by national self interest in many cases and international agreements in others..regarding the former consider the cases of China and the US. Moreover, adaptation is certainly driven by national governments..if not primarily by them. Do you really think that adaptation does not require rigorous implementation measures..consider Katrina (lack there of). Also, do you really think that mitigation measures will not improve as new information is developed? (Dennis Tirpak, OECD)	Not clear which mitigation action by China and the US is driven by national self interest. Special case (adaptation creates a public good and thus requires rigour) added. Explanation that FUTURE mitigation will also benefit from new information, added.
18-145	A	5	5	5	8	I think the differences between mitigation and adaptation may be a little-overstated. For example, if the chosen adaptation option in a coastal zone is planned retreat, this may be a public policy decision which over-rides the interests of private actors. Mitigation strategies can also benefit from more information, e.g. understanding better how to design energy efficiency programmes etc. (Jim Skea, UK Energy Research Centre)	Revised.
18-146	A	5	6	5	8	This sentence implies that whatever actions that are taken today to mitigate effects of GCC cannot be modified or stopped despite new information that may become available over time. Mitigation should follow the growing trend to "adaptive management" that allows periodic adjustments to meet the needs of changing model paradigms. The authors are reaching too far to draw the distinctions between mitigation and adaption in this case. Both must adjust but the time scales differ by orders of magnitude. (Suzanne Bolton, National Marine Fisheries Service/NOAA (ST7))	Revised.
18-147	A	5	6	5	6	"mitigation is by necessity based on information that is available today" -- one of the most important mitigation actions that can be taken today is research and development to expand available options, e.g. to develop low and zero arbon emitting energy technologies. While it is true that emissions can be reduced significantly with currently available technologies, if we are to get emissions low enough to stablize concentrations of ghgs at a cost that is not very painful, major technological advances are needed. Clearly, improving information will be important for both mitigation and adaptation and the text should say so. (Neil Leary, International START Secretariat)	Revised.
18-148	A	5	6	5	6	should read "… based on uncertain and incomplete knowledge available today …" (Stephan Lingner, Europäische Akademie GmbH)	Revised.
18-149	A	5	6	5	8	This sentence is very unclear and does not immediately command agreement (John Morton, Natural Resources Institute, University of Greenwich)	Revised.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
18-150	A	5	11	5	13	no reference (Patricia Iturregui, Consejo Nacional del Ambiente)	Summary box, only few references.
18-151	A	5	11			HOW can mitigation efforts foster adaptive capacity (examples)? (Rob Swart, MNP)	The sentence list examples. No action.
18-152	A	5	11	5	13	True, this would improve adaptive capacity. But why would this be part of a mitigation agenda? What would land reform or water markets contribute to emission reduction? (Richard S.J. Tol, Uni. Hamburg)	Sorry, no room for more explanation.
18-15	A	5	13	5	15	It is not necessarily true that increasing mitigation expenditures implies less funds for adaptation. The hypothesis would be true if there were a budget allocation process in which we first decide how much to allocate in total to manage climate change dangers and then allocate that amount among different strategies for the reduction of the dangers (e.g. mitigation and adaptation). But this type of budgeting process does not exist, nor is it likely to except in a few isolated situations. As noted later in the chapter, mitigation and adaptation decisions often will be taken by different entitites, each with its own, separate budget constraint. More spending on mitigation by an industrial firm will have very marginal effect on the resources available to agricultural extension services to spend on education about use of more water efficient crop varieties, and probably even less effect on the resources available to a farmer to purchase and use the seeds of these varieties. At an aggregate scale, e.g. national budgeting process, higher expenditures on mitigation would reduce the resources that would be available for ALL other possible uses (education, public health, military spending, etc), not just for adaptation. As adaptation spending will be a very small share of total spending, it is highly plausible that higher mitigation spending would not necessitate lower adaptation spending -- we might be smart enough to build fewer bombs instead. While there may be some tradeoff at a very aggregate scale, there is not a zero-sum budget for mitigation and adaptation that would necessitate a dollar less spending for one if a dollar more is spent on the other. A chapter that is on inter-relationships between mitigation and adaptation should take pains to avoid giving the impression that mititation and adaptation spending is a zero sum game; it need not be and treating these decisions as zero-sum would likely lead to poor choices. (Neil Leary, International START Secretariat)	Text changed to reflect these comments.
18-154	A	5	13	5	15	Very unclear - might be improved: "…especially those that would accrue to social groups…" (John Morton, Natural Resources Institute, University of Greenwich)	“accrue” out as a result of revision in response to the comment above.
18-155	A	5	13	5	15	This rather contradicts the text on p. 6 lines 23 - 27 (Jim Skea, UK Energy Research Centre)	Agree, text revised – see above - , now they are consistent..

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
18-156	A	5	13	5	13	Expenditure on mitigation does not necessarily reduce the social/private resources for adaptation. Firstly, completely different funders will be involved for the two processes (as pointed out on p6 lines 21-24). Secondly, mitigation (and perhaps adaptation, although not specifically stated in the literature) is best effected by investment in new technology. Technological change, though trade effects in a closed economy, can increase growth, have a positive effect on the economy and hence increase adaptive capacity. (Barker et al 2005). (Rachel Warren, School of Environmental Sciences)	Expenditure part corrected – see above. No room for the technology argument..
18-157	A	5	18	5	20	Add at the end of this para: "Hence, the need to develop optimal approaches to reducing damages due to CC." (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Agree but optimality is not an issue here. No action.
18-158	A	5	22	5	24	must be mentioned that mitigation and adaptation are also connected at the international level, as UNFCCC has important provisions for adaptation, otherwise will suggest to delete the whole paragraph (Patricia Iturregui, Consejo Nacional del Ambiente)	International level added.
18-159	A	5	24			What is the implicit social-cultural-technical baseline with reference to which adaptation or mitigation takes place. The notion of development path and capacity to respond partly address this issue but it could be made more explicit. Note also the implicitly western model of daily life (air-conditioning etc.) inscribed in the rest of the chapter. Are we to assume, also, a cultural hegemony built around the conventions of the USA? (Elizabeth shove, Lancaster University)	Not the proper place to discuss details of AM actions. No action.
18-160	A	5	28	7	43	Section 18.2 is confusing and seems self-serving. (Merylyn McKenzie Hedger, Environment Agency)	Yes, self-serving in the sense to establish a departure point: AM in TAR. No action.
18-161	A	5	39	5	40	I would disagree that the TAR synthesis report and final chapters of WGs II and III produced "limited results." Perhaps you mean that they produced little that shed light on interrelationships between mitigation and adaptation? If so, I would agree with that. But edit to clarify if the latter is your intended point. (Neil Leary, International START Secretariat)	Agree. Revised.
18-162	A	5	45	5	46	The comparisons are difficult for many reasons, but the two given are not the most impotant. Many IAMs run with probability distributions for parameters like these, and there has been broad agreement about what ranges to use since the SAR, although this might now be weakening. Incompatible discount rates, economic growth assumptions and policy instruments are more severe sources of difficulty. (Chris Hope, Judge Business School)	Disagree. The gap here is between GMT metric in WGII and concentration metric in WGIII. But agree with the other difficulties: added.
18-163	A	6	8	6	13	This is a very important conclusion and it sounds like this is in conflict with	Make clear: determinants of M and A capacity

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						subsequent discussions about response capacity. Section 18.3 on Decision Making This section includes many general discussions that are difficult directly to link to specific issues related to adaptation-mitigation linkages. It would maybe be good if this general discussion about climate change policies, which are relevant to the whole WGII, is integrated in Chapter 2 or in another more general chapter (Chapter 20?). (Kirsten Halsnaes, Riso International Laboratory)	are similar, but this does not always mean high AC = high MC. Rest is on 18.3.
18-164	A	6	11	6	12	"In a wealthy --- social group". Difficult to understand. (Mitsutsune Yamaguchi, Teikyo University)	Not clear what is difficult. No action.
18-165	A	6	25	6	27	This sentence only makes sense if the damages due to CC are the only problems that one needs to worry about. If one looks at the damages due to CC in the wider context of damages due to climate-sensitive problems (e.g., malaria, hunger, water stress) then it is more prudent for the next few decades to invest more heavily in efforts to reduce vulnerability to existing climate-sensitive problems (a form of adaptation). These analyses suggest that with respect to mitigation, the short to medium term emphasis should be on implementing "no regret" options and expanding the universe of such options through R & D. [Goklany 2003, 2005] (Indur Goklany, Office of Policy Analysis, Department of the Interior)	This is simple fact finding: what were the key statements on A-M linkages in TAR. No action.
18-166	A	6	25	6	25	The climatic impacts today are not small in all regions--just head to the Arctic, for example. (Michael MacCracken, Climate Institute)	Note: "relatively", and: TAR quote. No action.
18-167	A	6	27	6	28	18.1.1, pg. 6, lines 27-28: An essential and new recognition is made here; it is insufficient to embed this recognition in the middle of a paragraph: Refined logic suggests that investment in mitigation, rather than adaptation, is both more prudent and more pressing. (P. H. Liotta, Pell Center for International Relations and Public Policy)	Disagree. It is in the proper place in the logical flow of the paragraph. No action.
18-168	A	6	40	6	42	Clarify what is the context in which mitigation and adaptation efforts are to be balanced and what this means. It is not self evident since these decisions are taken by different, diffuse entities. Who is assumed to be doing the balancing? How? What does balancing mean when for most entitites, even very large nation states, the benefits of mitigation are largely external while the benefits of adaptation largely internal? (Neil Leary, International START Secretariat)	TAR quote. No action.
18-169	A	6	40	6	42	It seems to me too limiting to suggest that this balancing will be based mainly on economics. There are any number of examples where other factors enter in (e.g., Republican citizens in the US electing Bush, who pursues economic policies against their economic interest--and they say they knew this but he was against abortion). People will want to 9and should be encouraged to) consider a whole set of aspects--	Agree, but cannot: TAR quote.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						their environmental view, their ethical view, their national energy security view, and so on. I have a paper listing a number of these perspectives in terms of how it makes people consider the science and scientific uncertainties (it is in journal review, but an early version is on the Web at http://www.princeton.edu/~uchv/eeworkshop.html .). So, I would urge generalizing this sentence a bit--at least allowing for the interests other than economics that people bring to the discussion. (Michael MacCracken, Climate Institute)	
18-170	A	6	47	6	48	This is one of the places where it seems to me the cupboard of possibilities might have more in it if there were linkages made to development, sustainability, pollution, etc. (Michael MacCracken, Climate Institute)	The point is that TAR did not make those linkages, Ch18 later does.
18-171	A	7	4	7	5	not "producing methane release" but "in some cases could rise methane release", as wetland/peatland restoration is not often "build" methane producing objects and has a lot of beneficials for fire control, biodiversity, game fishing and hunting, recreation etc. (Andrey Sirin, Institute of Forest Science Russian Academy of Sciences)	Revised.
18-172	A	7	7			New Zeeland should be New Zealand (Susan Cutter, University of South Carolina)	Corrected.
18-173	A	7	7			18.1.1, pg. 7, line 7: New Zealand is mis-spelled. (P. H. Liotta, Pell Center for International Relations and Public Policy)	Corrected.
18-174	A	7	7	7	7	New Zealand (spelling)	Corrected.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Rachel Warren, School of Environmental Sciences)	
18-175	A	7	17	7	20	This list of negatives for reduced tillage is accurate for conventional (i.e., non-bioengineered) crops. Using reduced herbicide-tolerant (HT) GM crops changes this equation, because then it is possible to use herbicides with lower toxicity and lower persistence, which should have an overall positive impact (in terms of pesticides). See Goklany (2001: 37, 44); R. Fawcett and D. Towery, Conservation Tillage and Plant Biotechnology (West Lafayette, IN: Conservation Technolgy Information Center, 2002). (Indur Goklany, Office of Policy Analysis, Department of the Interior)	TAR quote. No action.
18-176	A	7	17	7	24	It is not made clear whether and how the negative and beneficial consequences affect adaptation to climate change specifically, rather than livelihoods and wellbeing more generally. (John Morton, Natural Resources Institute, University of Greenwich)	These are the negative impacts of mitigation, without any discussion how to adapt to them. TAR quote anyway, no change.
18-177	A	7	21	7	24	Benefits also include improvements in water quality, lower nutrient loadings in water bodies, and if HTGM crops are used, lower and less toxic pesticide levels in the water. (Indur Goklany, Office of Policy Analysis, Department of the Interior)	TAR quote. No action.
18-178	A	7	30	7	36	Again, it is unclear how adaptation to climate change comes into this argument (John Morton, Natural Resources Institute, University of Greenwich)	See 18-176
18-179	A	7	40	7	43	is not clear what is meant by "set aside" CDM projects (Patricia Iturregui, Consejo Nacional del Ambiente)	Explained.
18-180	A	7	46	12	25	Section 18.3-1 needs a major review. Pages of assertions. This seems totally unrelated to anything that happens anywhere. (Merylyn McKenzie Hedger, Environment Agency)	Noted. Will review.
18-181	A	7	46	20	14	I did not find much of this material (18.3) much help. It presents another framework for considering adaptation and, here, mitigation. But It is very general; a lot of time is spent describing three diagrams that did not help me very much. However, maybe they are helpful to others, but I have to ask the question as to how much is this an "essay" of a few authors on adaptation and mitigation and how much is it an "assessment". The last para of the section more-or-less dismisses the framework which seems an odd conclusion for 4 1/2 pages of text. (Ian Noble, The World Bank)	Noted. Will review.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
18-182	A	7	46			Section 18.3 I find section 18.3 the most difficult part of the chapter. It uses decision analysis as the framework for thinking about the links between mitigation and adaptation. It also considers how actions can be seen as embedded in sustainable development paths. There are hardly any references until section 18.3.4 page 14. This section of the chapter is closest in character to a "think piece" and I think some work is needed to embed it in an established literature. The " act then learn" framing is supported by a single reference. I found the response capacity/development pathways exposition in 18.3.4 much more convincing. (Jim Skea, UK Energy Research Centre)	Noted. Will review.
18-183	A	7	46			Section 18.3 takes up three and a half pages to cover the simple message that one should act, learn and then act again…this is hardly rocket science or a good use of IPCC pages. Unless information on other decision making tools and frameworks are in the literature this section can be reduced to one para....hopefully referenced! You may also wish to contact Tom Wilbanks (Oak Ridge). He gave a presentation at an IPCC expert meeting on Article2 in May 2004 in Buenos Aires that had a very simple chart titled "distinctions between adaptation and mitigation'. He may have published it by now and or perhaps you could with his agreement elaborate on it. (Dennis Tirpak, OECD)	Noted. Will be re-written.
18-184	A	7	46		10	This section strongly reinforces the notion that adaptation and mitigation entail tradeoffs (particulary the last paragraph on p8), but we know that the timescales, spatial scales, and actors are completely different. This point is acknowledged in Box 18.3 "adaptation analyis has been bottom-up by necessity", which won't change - how can this be reconciled with top-down analysis of the previous pages? In general, the emphasis on the top-down literature is excessive, given its acknowledged ilimitations. (Henry David Venema, International Institute for Sustainable Development)	Noted. Will be re-written
18-185	A	7	46	13	25	Too much context were written by the authors in stead of summary on ralative literatures. (Shaohong WU, Institute of Geographical Sciences and Natural Resource Research, CAS)	Noted. Will correct
18-186	A	7	50	7	50	Delete 1st sentence: "hollow rethorics" (Tom Kram, MNP-RIVM)	Will do.
18-187	A	7	50	8	29	These three paras could do with shortening	Will do

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(John Morton, Natural Resources Institute, University of Greenwich)	
18-188	A	8	0	9		Learning by doing appears not to be a necessarily feasible strategy with regards to the new understanding of irreversibility of climate change. Selecting strategy today society may be locked in a particular trajectory of social economic development. Later it may be difficult and expensive to switch trajectory as a result of learning (better understanding of damages related to climate change). (Alexander Golub, Environmental Defense)	Noted. Will be re-written
18-189	A	8	1	8	1	This framing of the issue seems not very helpful. There will always be uncertainties--this is the toughest issue being studied by experts given its scope, time scale, etc. The question is whether these uncertainties are really important. I realize the next sentence picks up on this, but this paragraph in general is directed at the more rational thinkers in the world. Here in the US, the whole research plan is focused around not simply reducing uncertainties (they give no limits below which to get, no linkages across uncertainties to consider relative importance, if any, etc.)--but apparently on eliminating uncertainties. While this might seem absurd to those who think about uncertainties, this is nonetheless how things are being looked at. So, I would urge a rewording here so as not to allow that type of misimpression. One might say, for example, "While further research is needed to increase the level of our understanding ...." or something starting that way or a similar way. (Michael MacCracken, Climate Institute)	Noted. Will be re-writtten
18-190	A	8	1			I do not believe that uncertainties exist in our understanding of the basic physics of the greenhouse effect. This message needs to be nuanced and in keeping with the messages from WG1 (Dennis Tirpak, OECD)	Noted. Will be clarified.
18-191	A	8	4			Prescriptive (Dennis Tirpak, OECD)	Noted. Will be corrected.
18-192	A	8	5	8	5	should read "… constitutes the appropriate mix …" (Stephan Lingner, Europäische Akademie GmbH)	Noted. Will be addressed.
18-193	A	8	8		9	replace "should it occur" (which is no longer a relevant phrasing) with "as it unfolds" (Susanne Moser, National Center for Atmospheric Research)	Noted. Will be clarified.
18-194	A	8	9			R&D is a type or form of 'action' (policy option) that relates to both mitigation and adaptation. You can mitigate, adapt, invest in science or do nothing. (Dennis Tirpak, OECD)	Noted. Will be clarified.
18-195	A	8	10	8	10	should read "… to reduce and handle uncertainties …" (Stephan Lingner, Europäische Akademie GmbH)	Noted. Will be clarified.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
18-196	A	8	13	8	13	should read "… possible decisions, both …" (Stephan Lingner, Europäische Akademie GmbH)	Noted. Will be corrected.
18-197	A	8	13	8	21	This paragraph contains some sweeping generalizations about proactive/reactive adaptation and the role of private/public sector actors. If this is true, can it be supported by examples or literature references? What if the construction industry changes building design to take account of a changed climate? Isn't that private sector pro-active? (Jim Skea, UK Energy Research Centre)	Noted. Will be re-written.
18-198	A	8	13		21	Why is this para needed? There are no references..which member states?…do you mean national governments?…what activity at a grassroots level? Do you presume that everyone knows what proactive adaptation is from earlier chapters or the glossary? (Dennis Tirpak, OECD)	Noted. Will be re-written
18-199	A	8	15	8	16	One should specify what is meant by the "grassroot level". Is it subregions, cities, households, grassroots movements? (Martin Welp, Potsdam Institute for Climate Impact Research)	Noted. Will be clarified.
18-200	A	8	16	8	21	This is a much more nuanced discussion of the actors involved in adapation than that at p.5, lines 1-6 above, which it partially contradicts (John Morton, Natural Resources Institute, University of Greenwich)	Noted. Will be clarified.
18-201	A	8	17	8	18	Proactive adaptations also include: (a) institutional changes such as developing regimes for property rights for water, water pricing, eliminating subsidies, strengthening institutions for stimulating economic development, trade, and human capital, etc., (b) long term research on boosting ag and forest productivity under cliamtic and soils conditions that may be more prevalent under cliamte change [Goklany (1995, 2003, 2005b)]. None of these involve construction projects but do require long lead times, and considerable trial-and-error, in practice. (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted. Will be considered.
18-202	A	8	17	8	18	common understanding of what is meant by "proactive" and "reactive"? (Stephan Lingner, Europäische Akademie GmbH)	Noted. Will be clairfieid.
18-203	A	8	20	8	9	The last sentence needs clarification. What "same" features apply? Assuming both theoretical and applied research will continue apace, it is reasonable to also assume that much new information will result from peripheral arenas and not necessarily be as subject to the whims of "developers and users" directed specifically to climate change. (Suzanne Bolton, National Marine Fisheries Service/NOAA (ST7))	Noted. Will be clarified.
18-204	A	8	23	9	50	This is very nicely put together. What I like about it most is that it preserves flexibility for society to learn and do things more smartly as time goes by. Should note that the	Noted.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						"act, then learn, then act again" is also the essence of adaptive management. (Indur Goklany, Office of Policy Analysis, Department of the Interior)	
18-205	A	8	23	8	29	This comment is not directly related to this paragraph, but instead an observation of a point that might need to be mentioned somewhere in this part of the chapter, namely that the balance being sought between adaptation and mitigation might well be different in different nations (e.g., developed versus developing). In developed, the environment can typically be valued considerably more highly than in developing nations because in the latter resources are needed to survive from today to tomorrow or next year, whereas in developing there is the potential to use resources for the environment per se as other needs are more nearly fully met. So, the type of tradeoff might be different--with mitigation measures expected to be more readily undertaken in developed than developing nations--or alternatively stated, with developing nations needing more balancing of impact reduction to undertake mitigation than in developed nations. Now, this is no more than the development paradigm of developed nations going first, but it might be good to explain and justify this here, and noting that the balancing of adaptation versus mitigation will depend on circumstances and relative priorities, and not just simple economics. [Just a thought--perhaps not clearly expressed.] (Michael MacCracken, Climate Institute)	Noted.
18-206	A	8	23		29	I would turn this para around…start with the last sentence. Then say decision makers need a conceptual framework to help shape their decisions…then note that decision analysis is one such tool…However, I am not sure I would call it a framework. (Dennis Tirpak, OECD)	Noted. Will re-write
18-207	A	8	31			Caricature is the wrong word. (Chris Hope, Judge Business School)	Noted. Will correct
18-208	A	8	31	9	50	Who is assumed to be making these decisions? The COP of the UNFCCC? Coallitions of nations? Single nation states? Exxon? The mayor of Potsdam? A farmer? Leaving the decision maker unspecified makes these paragraphs too abstract to be of much use that I can see. These paragraphs might be more informative if you select a specific decision context and develop a decision tree that is specific to that context. (Neil Leary, International START Secretariat)	Noted. Will clarify.
18-209	A	8	31	11	45	The approach in figure 18 focusses on an emissions target approach rather than an approach that sets costs equal to marginal benefits and letting economic actors determine how much emission abatement and mitigation will occur (in a move to reaching a long run target). This stylized decision tree fits neatly into a command and control approach to policy where a government official is making decisions but does	Noted. Will clarify.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						not seem to fit a dynamic market process and the collective decisions of many individual households and firms. There seems to be no distinction made between government investment decisions based on political goals (usually around an emissions target) and private investment decisions based on expected rates of return and evaluation of costs and benefits of alternative actions. This distinction must be important - it is not only governments that are making abatement and adaptation decisions (which is acknowledged in the report) and decisions should not always be couched in terms of emissions targets rather than equating costs and benefits under uncertainty. (Warwick McKibbin, RSPAS, ANU)	
18-210	A	8	31	8	50	In this part the report acknowledges the dynamic nature of the climate policy process. The "act, then learn, then act again" approach fits well here. The graphs however do not illustrate this "learning circle". Furthermore the text seems to suggests that the development of climate policy is a smooth process. The possibility of fast transitions as a consequence of changes in public perceptions, expectations of businesses, etc. should be mentioned. Climate policy makers should prepare for such transitions. (Martin Welp, Potsdam Institute for Climate Impact Research)	Noted. Will be re-written
18-211	A	8	32	37		Who is making these 'decisions'; more important how are alternative options and courses of action defined, and again by whom? The construction of viable options is at least as important as the making of decisions between them. (Elizabeth shove, Lancaster University)	Noted. Will be made clear
18-212	A	8	35			If it is questionable as to whether such an analysis is possible..why introduce the tool? (Dennis Tirpak, OECD)	Noted. Will re-write.
18-213	A	8	37	8	37	continue sentence: "… and the uncertainties thereupon." (Stephan Lingner, Europäische Akademie GmbH)	Noted.
18-214	A	8	40	9	49	Too many questions but too few answers. (Shaohong WU, Institute of Geographical Sciences and Natural Resource Research, CAS)	Noted. Will try to clarify
18-215	A	8	41			Who is we? See line 36-37 p8. (Elizabeth shove, Lancaster University)	Will correct
18-216	A	8	42	8	45	Are the outcome nodes included in the figure? (Kirsten Halsnaes, Riso International Laboratory)	Will clarify
18-217	A	8	44	8	44	should read ".. which may reasonably influence …" (Stephan Lingner, Europäische Akademie GmbH)	Will correct
18-218	A	8	45	8	45	inconsistent language with figure 18.1	Will correct

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Tom Kram, MNP-RIVM)	
18-219	A	9	1	9	39	This figure (when actually detailed) and related text would certainly seem to have the potential to be quite different depending on the species under consideration. I wonder if perhaps the species--or at least the short-lived versus long-lived species ought to be differentiated here. (Michael MacCracken, Climate Institute)	Will clarify
18-220	A	9	4			Likewise, who is it that 'learns'? And is this the same actor or institution that acts? (Elizabeth shove, Lancaster University)	Will clarify
18-221	A	9	9	1	35	Figure 18.1 - while I realize this figure likely conforms to a standard format, as a physical scientist I would find it helpful if more details were included so that the figure were able to represent more clearly the influence of the decisions made on the outcomes (Katharine Hayhoe, Texas Tech University)	Will clarify
18-222	A	9	34			Very simplistic view of the decisionmaking process. It could benefit from more clarification. Why not include a real world example here? (Susan Cutter, University of South Carolina)	Will clarify
18-223	A	9	37			Figure 18.1 Do you really think that a decision maker would understand this figure? Drop it! (Dennis Tirpak, OECD)	Will consider.
18-224	A	9				Figure 18.1: The coherence of demographic changes to the climate policy process seems to be rather loose. (Stephan Lingner, Europäische Akademie GmbH)	Will clairfy
18-225	A	10	2	10	8	It is very unclear what is meant by the development path concept, and I do not understand the discussion about development path as an uncertainty note or decision node. A development path rather can be understood as related to where, we actually are moving to. Decisions that are influencing the path are not “development path” decisions (?), but many individual decisions by stakeholders, government actions etc. and these are framed by institutional structures. Page 10, figure 18.2: The figure is very general, and the explanation is not so convincing. As I understand the explanation, climate policies (rectangular panels) are framing development paths (or nodes), which look like a very far going perspective. Is it not rather the case that cc policies are framed by development pathways? Box 18.2: The definition is not needed here. (Kirsten Halsnaes, Riso International Laboratory)	Will clarify
18-226	A	10	2			Define development path at this point	Will do.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Elizabeth shove, Lancaster University)	
18-227	A	10	2		20	These two para convey an important message concerning the relationship between CC and development. They can be boiled down to a very succinct message without the incumbering references to decision nodes and frameworks. Figure 18.3 does not help the reader nor does the text for the figure. Drop it (Dennis Tirpak, OECD)	Will clarify
18-228	A	10	10	21	48	Figure 18.2 - this figure needs to be clarified for more ready comprehension by a non-specialist in the field. In particular, it is very difficult to understand as an abstract decision. Use of a concrete, climate-related example would greatly enhance the reader's understanding of the structure. Also, what is the difference between "decisions" and "choices"? I understand that a choice is made by decision, but since the branching paths clearly indicate that a decision has been made between one of two choices only, I fail to see the usefulness of the rectangular boxes. Again, I understand that this may be a standard format for a field of research with which I am unfamiliar; however, in order to communicate these important results outside that field, clear and easily followed figures are a necessity. (Katharine Hayhoe, Texas Tech University)	Will clarify
18-229	A	10	10	10	20	This paragraph should stress more the need to integrate climate policy into other policy areas (mainstreaming). (Martin Welp, Potsdam Institute for Climate Impact Research)	Will elaborate.
18-230	A	10	20	10	50	The graphical elements in this figure need some more explanation. It is very difficult to "read" this figure. (Martin Welp, Potsdam Institute for Climate Impact Research)	Will clarify
18-231	A	10	23			Figure 18.2: I really did not find this figure helpful (John Morton, Natural Resources Institute, University of Greenwich)	Noted. Will consider
18-232	A	10	38			Figure 18.2: it is not clear to which level it is linked (national or international) will be better if some titles will be attached to the figure as it is too abstract (Patricia Iturregui, Consejo Nacional del Ambiente)	Will clarify
18-233	A	10	38	10		Fig 18.2, branch decisions are not necessarily tipping points (Jonathan Köhler, University of Cambridge)	Will correct
18-234	A	10	38	10	48	I don't find that figure 18.2 helps to explain the issues discussed in the text on this page. In fact, I think that the figure makes these important ideas more confusing than need be. Suggest that the figure be deleted. (Neil Leary, International START Secretariat)	Will clarify
18-235	A	10	38			Figure 18.2: Drawing on Beltratti's conceptual approach, the illustration is unclear and	Will clarify

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						the textual explanation is insufficient. Figure 18.2: The overall illustration is unreadable and the textual reference/explanation lack clarity and sufficiency. (P. H. Liotta, Pell Center for International Relations and Public Policy)	
18-236	A	10	38			There should be more explanation of what it means not to take a path (what are the branches foregone). Also what is the implied unit of analysis and what is it that is implicitly represented by the flow: is it simply 'development"? (Elizabeth shove, Lancaster University)	Will elaborate
18-237	A	10	45		46	"sometimes called tipping points" - I find the proliferation of the use of this term problematic. It means something rather specific, but everyone seems to claim it for whatever they want it to mean. The way you use it here, I don't think is correct. A branch point is a branch point. Maybe something decisive or even irreversible, but it is not (necessarily) the point in a process where positive feedback mechanisms take over and the system moves unstoppably toward a new state. I suggest taking out the reference to this term (everything between the commas). (Susanne Moser, National Center for Atmospheric Research)	Will clarify
18-238	A	11	1	11	50	Box 18.2 and 18.3 seem out of place, aren't mentioned in the preceding text, so it is hard to see where they fit in. (Susan Cutter, University of South Carolina)	Will clarify
18-239	A	11	1			Comment on Box 18.2: Should also note undertaking R&D to devise more cost-effective methods of mitigation and to reduce the total present value costs of mitigation is also part and parcel of "mitigation policy." [I don't know if the NAS had anything to say about it explicitly. It might have.] (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Will correct
18-240	A	11	1			Box 18.2 isn't really needed and could be deleted. (Neil Leary, International START Secretariat)	Will consider
18-241	A	11	1	11	12	The purpose of this box is unclear, I sugegst to drop it (Rob Swart, MNP)	Noted. Will clarify
18-242	A	11	1	11	12	The title of this box is incomplete. Also the reference seems to be incomplete (year is missing) (Martin Welp, Potsdam Institute for Climate Impact Research)	Noted. Will clarify
18-243	A	11	2			Box 18.2 is not clear what is the use of the box given the context of this part, it could be drafted in the text adding the reference more precisely (Patricia Iturregui, Consejo Nacional del Ambiente)	Noted. Will clarify
18-244	A	11	11	1	12	This box seems out of place. What is its purpose? Is the NAS definition being	Noted. Will clarify

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						compared or contrasted to the IPCC definitions that are given earlier? The purpose of this alternate definition needs to be clarified and the box (or the text within it) moved up to earlier in introduction where the definitions of adaptation and mitigation are first stated. (Katharine Hayhoe, Texas Tech University)	
18-245	A	11	11	45	48	Need to provide a reference for the "multi-model" study referred to in line 45 (Katharine Hayhoe, Texas Tech University)	Noted. Will clarify
18-246	A	11	11	50	50	A basic introductory reference for the TWA approach would also be helpful. (Katharine Hayhoe, Texas Tech University)	Noted. Will clarify
18-247	A	11	15			Box 18.3 -- It is relatively straight forward to compare the cost-effectiveness of different mitigation measures because the desired outcome can be measured in a common unit, carbon equivalent reduction in emissions. But in the case of adpatation, the outcomes are much more varied. When the outcomes of adaptatin measures are very different, e.g. lives saved versus tons of wheat yield gained, cost-effectiveness cannot be used to compare the measures. This difference might be discussed in the box or related text. (Neil Leary, International START Secretariat)	Noted. Will elaborate.
18-248	A	11	16			Box 18.3: The box tends to mix conceptual approaches like CBA, and cost effectiveness with applications of these in climate policy analysis. I will suggest that separate concepts and applications and add MCA to the concepts. Safe landing can then we covered together with other applications including various integrated assessment models. Furthermore, it can be argued that safe landing is a cost effectiveness application (this is e.g. the approach of WGIII Chapter 2). (Kirsten Halsnaes, Riso International Laboratory)	Noted. Will clarify
18-249	A	11	16			Box 18.3: there is no source or reference, the issue is very controversial as article 2 does not include any possibility for cost-effectiveness tradeoffs. According to Verheyen (2005) article 3.3. Mentions cost effectiveness in the context of the precautionary principle obliging Parties to comply with their commitments as cost effectively as possible (Patricia Iturregui, Consejo Nacional del Ambiente)	Noted. Will clarify
18-250	A	11	16			Box 18.3: inadequate and confusing. CEA is NOT about balancing mitigation and adaptation but presumes agreed "safe" level of mitigation. Purpose and appliccability of TWA are questionable here, see also comments to p.20, line 44 (#26) (Tom Kram, MNP-RIVM)	Noted. Will clarify
18-251	A	11	16	11	48	I don't find the discussion in Box 18.3 convincing - why is working out the level of dangerous anthropogenic intererence easier than calculating costs and benefits (line	Noted. Will clarify

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						27-30 page 11)? Surely it is easier to implement a policy designed with a cost target and then measure the extent of abatement and mitigation in a "learning by doing" way over time while we learn what a dangerous level of emissions might be. The idea that a dangerous level can be known (even within tolerable windows) and that "mitigation costs are of secondary importance" will lead to bad policy design. Costs will ultimately determine whether policies are tolerated or rejected by a amjority of carbon emitters. Hence why so many countries are not taking on explicit targets. See McKibbin W. and P. Wilcoxen (2002) 'The Role of Economics in Climate Change Policy", Journal of Economic Perspectives, vol 16, no 2, pp107-130. (Warwick McKibbin, RSPAS, ANU)	
18-252	A	11	16	12	15	Box 18.3 would be more useful in this chapter if it would assess explicitly how these approaches address adaptation/mitgation linkages and choices (Rob Swart, MNP)	Noted. Will clarify
18-253	A	11	16			Box 18.3 Again why is this box here..what is the connection to the text? The discussion of cost effectiveness, cost benefit analysis and the TWA is treated more carefully on pages 20-21. This appears to be a major duplication without references. In all case, if quoting the Convention reference the specific Article. Page 27 lines 3-9 note the phrase "to enable economic development to proceed in a sustainable manner" which contradicts the statement that mitigation costs are secondary importance. Line 27 is an opinion. Line 30 reference missing. Line 37 do you mean mitigation or CC? Lines 45-48.. no reference. (Dennis Tirpak, OECD)	Noted. Will clarify
18-254	A	11	21			Strike the sentence, "Mitigation costs are of secondary importance." -- because as the next sentence states policies should be cost-effective. (Indur Goklany, Office of Policy Analysis, Department of the Interior)	
18-255	A	11	23	11	23	should read: "… maximum still safe level .." (Stephan Lingner, Europäische Akademie GmbH)	Noted. Will correct
18-256	A	11	23	11	24	should read "… has been defined, …" (Stephan Lingner, Europäische Akademie GmbH)	Noted. Will correct
18-257	A	11	27	11	30	Paragraph is very confusing - has cost-effectiveness been substituted for cost-benefit at line 27? (John Morton, Natural Resources Institute, University of Greenwich)	Noted. Will clarify
18-258	A	11	29	11	30	Cost-benefit analysis of emission reduction is good enough for the American Economic Review and for Science. Why not for the IPCC? (Richard S.J. Tol, Uni. Hamburg)	Noted. Will clarify

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
18-259	A	11	32	11	39	Add "and cost benefit analysis requires conversion of many different damages to a common metric, and if that is through monetisation then inevitably subjective judgements about the values of very different benefits relative to each other, and differing opinions about the appropriate choice of a discount rate, imply that such analysis is controversial" and cross reference WGIII Ch 3 section 3.5 (Rachel Warren, School of Environmental Sciences)	Noted. Will clarify
18-260	A	11	34	11	36	Could cite the PAGE model here, which from its earliest version in 1993 has treated both mitigation and adaptation as decision variables. Hope C, P Wenman and J Anderson “Policy analysis of the greenhouse effect”, Energy Policy, 21, 3, p327-338, March 1993. (Chris Hope, Judge Business School)	Noted. Will clarify
18-261	A	11	34	11	36	“---relatively few attempts---”, Better to cite literatures attempting to simultaneously treat mitigation and adaptation as this is very important part of this chapter. (Mitsutsune Yamaguchi, Teikyo University)	Noted. Will clarify
18-262	A	11	38	11	39	Insert "usually" between "has" and "been" online 38, and "generally" before "conducted" on line 39. (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted. Will correct
18-263	A	11	38			Box 18.2 What is the purpose of this box..how is it connected to the text? (Dennis Tirpak, OECD)	Noted. Will clarify
18-264	A	11	40			Add a new para here as follows: "There have, however, been exploratory efforts recently to evaluate and compare the costs and benefits over the short and medium term of various adaptation policies at the global level to mitigation efforts. These studies suggest that over the next few decades it would be cheaper and more effective to focus on proactive adaptation -- reducing vulnerability to current climate sensitive problems that might be exacerbated by CC or through efforts to more broadly enhance adaptive capacity through sustainble development -- rather than on mitigation that would go beyond "no regrets". In the interim, these studies suggest, efforts should be made to make mitigation more cost-effective in the long term, while implementing "no regret" measures (Goklany 2003, 2005)". (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted. Will clarify
18-265	A	11	41	11	42	Reformulate: what is meant is that methodologies can also be used in probabilistic setting to support decision making. (Tom Kram, MNP-RIVM)	Noted. Will clarify
18-266	A	11	41	11	48	Cross reference WGIII Ch 3 section 3.6 (Rachel Warren, School of Environmental Sciences)	Noted. Will do

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
18-267	A	11	45	11	46	Please cite a literature. (Mitsutsune Yamaguchi, Teikyo University)	Noted. Will do
18-268	A	11	50	12	14	No good reason to describe the TWA approach in such detail, particularly as it cannot cope well with uncertainty, which is the focus of this section. (Chris Hope, Judge Business School)	Noted. Will clarify
18-269	A	11	50	12	14	Strange mix of methodology and TWA model description, no reference to check claims made here. Suggest to drop or drastically reformulate this paragraph. (Tom Kram, MNP-RIVM)	Noted. Will clarify
18-270	A	12	1	12	3	Perhaps, my point of note is not the right time but some attention should be paid to the subject of "shifting baselines" that have become a focus in much discussion of marine environmental quality and it certainly applies to this discussion, especially when reference is made to "unacceptable climate change impacts". "Shifting baselines" simply note that a baseline (level of acceptablility) is a reference point in time, "how things used to be". If those reference points shift with generations, we lose track of standards and eventually accept a more degraded state as standard. This variable needs to be added to the considerations of "acceptibility" in this charter. (Suzanne Bolton, National Marine Fisheries Service/NOAA (ST7))	Noted. Will clarify
18-271	A	12	4	12	4	should read: "…if the corridor would be valid, …" (Stephan Lingner, Europäische Akademie GmbH)	Noted. Will correct
18-272	A	12	6	12	6	should read "..if such a corridor cannot be reasonably established, …" (Stephan Lingner, Europäische Akademie GmbH)	Noted. Will correct
18-273	A	12	8			Please replace: “Probabilistic versions of the TWA model are not available as yet but it is possible to conduct standard uncertainty analyses.” by “Probabilistic versions of the TWA model are now available (Zickfeld and Bruckner, 2003; Rahmstorf and Zickfeld, 2005). In addition, it is possible to conduct extensively standard uncertainty analyses (Kriegler and Bruckner 2003).” [The cited references are: Rahmstorf, S. and K. Zickfeld (2005), Thermohaline circulation changes: a question of risk assessment, Climatic Change 68, 241-247. K. Zickfeld, T. Bruckner: Reducing the Risk of Abrupt Climate Change: Emissions Corridors Preserving the Atlantic Thermohaline Circulation, Integrated Assessment 4, 106-115 (2003). E. Kriegler, T. Bruckner: Sensitivity Analysis of Emissions Corridors for the 21st Century, Climatic Change 66, 345-387 (2004).] (Thomas Bruckner, Technical University of Berlin)	Noted. Will clarify

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
18-274	A	12	12	42	43	Initially, adaptation decisions are also likely to be top-down decisions (rather than bottom-up), based on scientific input and projections of future change rather than present-day observed impacts large enough to be obvious to and thus drive adaptation measures on the part of individuals and the general public. (Katharine Hayhoe, Texas Tech University)	Noted. Will clarify
18-275	A	12	22	12	22	Add: "Ethical considerations, e.g., by introducing minimax rules, might guide respective evaluations, too. (Stephan Lingner, Europäische Akademie GmbH)	Noted. Will clarify
18-276	A	12	25		25	add the word "minimize" before trade-offs; one does not take advantage of trade-offs. (Susanne Moser, National Center for Atmospheric Research)	Noted. Will clarify
18-277	A	12	28	13	33	Important differences in the relationship between mitigation and adaptation at the different scales are noted in section 18.3.2. They imply different objectives and decision processes for the different scales. Consider moving this section before section 18.3.1 on objectives and decision processes and revising the section on objectives and decision processes so as to highlight differences in objectives and processes for the different scales. (Neil Leary, International START Secretariat)	Noted. Will clarify
18-278	A	12	28			Section 18.3.2: This section might be where it would be wroth also indicating that the decisions will vary by the species being considered (so long-lived ones like CO2 versus short-lived ones like methane and soot). There is, for example, a lot that can be done to capture and use methane as fuel--and this will help with air quality, etc; similarly, reducing soot emissions would help mitigate climate change and improve health, etc. I would urge mention of the various species and how this would seem likely to increase the potential for options linking adaptation and mitigation--especially as the present text is quite vague on the issue of species. (Michael MacCracken, Climate Institute)	Noted. Will clarify
18-279	A	12	28	13	33	The decision-action-learning process you describe is typically called (especially if this is done deliberately) "adaptive assessment and management" - why do you not call it that, or make reference to it throughout section 18.3.2? I guess, if it's less deliberate, it's called trial and error or Muddling through -- there is a policy and management literature that speaks to all this. Why not reference it? Also for this section, I had a hard time understanding the logical flow of the paragraphs - please give a roadmap or make the flow more obvious to the readers. (Susanne Moser, National Center for Atmospheric Research)	Noted. Will clarify
18-280	A	12	28	13	33	This is an important section that is almost void of references…e.g. line 4 (which UNFCCC documents?)	Noted. Will clarify

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Dennis Tirpak, OECD)	
18-281	A	12	30			Isn't climate change decisionmaking more than acting, learning, the acting? This seems overly simplistic and not based in the rich literature on decisionmaking under uncertainty. (Susan Cutter, University of South Carolina)	Noted. Will clarify
18-282	A	12	30	13	33	I generally agree with this section and its emphasis on the potential for policy to drive coherent linkages, and I suggest a practical operational typpology of M-A synergies relevant to SD policy: 1. mitigation projects that promote adaptation by enhancing ecosystem regulatory and provisioning services (again refer to the Millennium Ecosystem Assessment!), and 2. mitigation projects that increase adaptive capacity through expanded povert alleviation by expanded energy services (see World Energy Council 2004 update and IEA WSSD statement), and 3. Mitigation projects that promote adaptation by a combination of 1 and 2. (Henry David Venema, International Institute for Sustainable Development)	Noted. Will clarify
18-283	A	12	33		33	after "processes" add: "and by the degree and nature of climate change itself" (Susanne Moser, National Center for Atmospheric Research)	Noted. Will correct
18-284	A	12	36			Working with this decision-making model, it is important to notice that some decisions are more momentous than others: there are possibilities for radical and incremental change, for thresholds of development and for transitions triggered by 'small' events. (Elizabeth shove, Lancaster University)	Noted. Will clarify
18-285	A	12	41	12	43	I find this surprising - certainly looking at farmers and pastoralists in developing countries it should rather be argued that they are more likely to react responsively than proactively (John Morton, Natural Resources Institute, University of Greenwich)	Noted. Will clarify
18-286	A	12	43	12	44	The example is not necessarily a good one - it could be argued that decisions to purchase air conditioning are based as much on experience of extremes as on experiences of rising mean temperatures (John Morton, Natural Resources Institute, University of Greenwich)	Noted. Will clarify
18-287	A	12	46	12	48	Repeats 12 33-34. (Chris Hope, Judge Business School)	Noted. Will correct
18-288	A	12	46		48	this passage almost verbatum repeats what was just said in lines 33-34 above on that same page. (Susanne Moser, National Center for Atmospheric Research)	Noted. Will correct
18-289	A	13	6		10	This paragraph is a bit awkward. Decision-making scales are as much socially constructed as "spatial scales", so no wonder they are congruent. How we think and	Noted. Will clarify

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						where we act are obviously related. Maybe the problem here is that you posit "spatial scale" as something "natural" or "naturally given", and you could help yourselves here if you clarified what kind of spatial scale (of what phenomena) you have in mind. Is it of social or administrative units, or of environmental systems or what? If it's the latter, of course, this sentence could be contested quite clearly, as there is often a mismatch between decision-making and environmental systems. I recommend the following reference here: Cash, David W. and Susanne C. Moser. 2000. "Linking global and local scales: Designing dynamic assessment and management processes." Global Environmental Change 10(2): 109-120. you should also check into IDGEC scale publications on this matter. (Susanne Moser, National Center for Atmospheric Research)	
18-290	A	13	8	13	8	Please explain how mitigation and adaptation are often seen as substitutes. (Youba SOKONA, Sahel and Sahara Observatory (OSS))	Noted. Will clarify
18-291	A	13	9	13	10	References for this sentence: [1} Tol, RSJ. 2005. Of Dangerous Climate Change and Dangerous Emission Reduction. Symposium on Avoiding Dangerous Climate Change, Exeter, Febrauary 1-3, 2005. [2] Goklany (2001). (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted. Will include
18-292	A	13	9		10	The last sentence in this paragraph is a claim often heard, but I have yet to be convinced. The folks (and budgets) dealing with mitigation and those dealing with adaptation are often NOT the same, and hence it is not clear that this is just more than a yet-to-be-examined assumption. If you want to leave it in, I guess, you need to reference it with some good empirical evidence. (Susanne Moser, National Center for Atmospheric Research)	Noted. Will clarify
18-293	A	13	9			The last sentence is not connected to the first two in this para which discuss one spatial scale ....Also..mitigation does not necessarily impede all social development..it can build capacity to deal with a lot of other social needs. (Dennis Tirpak, OECD)	Noted. Will clarify
18-294	A	13	9	13	10	Expenditure on mitigation does not necessarily reduce the social/private resources for adaptation. Firstly, completely different funders will be involved for the two processes (as pointed out on p6 lines 21-24). Secondly, mitigation (and perhaps adaptation, although not specifically stated in the literature) is best effected by investment in new technology. Technological change, though trade effects in a closed economy, can increase growth, have a positive effect on the economy and hence increase adaptive capacity. (Barker et al 2005). (Rachel Warren, School of Environmental Sciences)	Noted. Will clarify
18-295	A	13	12	13	20	This is a good paragraph. More of the chapter should read like this.	Noted. Will try

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Susan Cutter, University of South Carolina)	
18-296	A	13	27	13	33	preliminary style (Stephan Lingner, Europäische Akademie GmbH)	Noted. Will clarify
18-297	A	13	27		33	This paragraph, too, could benefit from being a bit more informed by the work that came out of IDGEC on scale issues. (Susanne Moser, National Center for Atmospheric Research)	Noted. Will clarify
18-298	A	13	27	13	33	This para raises the so often repeated comment that there are linkages across scales etc etc, but gives no examples and certianly no insights into what readers are supposed to make of this point. (Ian Noble, The World Bank)	Noted. Will clarify
18-299	A	13	27	13	33	This is not clear at all (Youba SOKONA, Sahel and Sahara Observatory (OSS))	Noted. Will clarify
18-300	A	13	31			what is BP? (Susan Cutter, University of South Carolina)	Noted. Will clarify
18-301	A	13	36	14	26	This section should refer also to recent literature on stakeholder dialogues. Stakeholder dialogues can be an interface between science and society and thus foster mutual learning processes (scientists, decision-makers, the general public). (Martin Welp, Potsdam Institute for Climate Impact Research)	Will add references to participatory literatures, esp. PIA literature
18-302	A	13	38			What if there are different actors and learners, and what if they learn different things from the same action? This is too simplistic a model to cope with the diversity that is acknowledged elsewhere in the chapter. (Elizabeth shove, Lancaster University)	Will add appropriate nuances
18-303	A	13	39	13	40	"Stakeholders may be characterised according to their constitution…" What is the meaning of "constitution" in this context and is there another word that might have a more universal meaning? (Suzanne Bolton, National Marine Fisheries Service/NOAA (ST7))	Will try to find alternative word
18-304	A	13	49	14	1	This split between risk and uncertainty is not well established and is fraught with problems. See, for instance, Dowie J, 1999, "Against risk", Risk decision and policy, 4, 1, 57-73. (Chris Hope, Judge Business School)	Will consider reference and revise
18-305	A	14	1		4	The list of factors that go into stakeholder decision-making seem incomplete to me: what about values and preferences, motivations, and perceived barriers to action or perceived efficacy of an action to achieve a desired outcome, and perceived self-efficacy in carrying it out? What about the power relationships that underlie these calculations? The political and the psychological literature could be tapped here more	Will amplify

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						fully. (Susanne Moser, National Center for Atmospheric Research)	
18-306	A	14	1			Stakeholder decision making…' seems to imply a sequence, but the list that follows does not…it is also not a logical set….please and fix the sentence structure …add some gerunds (Dennis Tirpak, OECD)	Will improve sentence
18-307	A	14	3			Clark et al 2001 is not in the references (Susan Cutter, University of South Carolina)	Will add
18-308	A	14	5		6	seems like precautionary response is not the only one when faced with deep uncertainty. The wait and see stance, the denial, all of these are far too common as well…. (Susanne Moser, National Center for Atmospheric Research)	No response needed
18-309	A	14	7	14	8	Cross reference WGIII Ch 3 section 3.5 & 3.6 (Rachel Warren, School of Environmental Sciences)	OK
18-310	A	14	11	14	18	18.3.3, pg. 14, lines 11-18: That corporate decision makers often lack responsibility for both adaptation and mitigation is a crucial. As with 18.1.1, pg. 4, lines 3-10, final paragraph: Do not wait until the final paragraph of a section to emphasize a crucial point. This recognition is critical and must receive emphasis—from the beginning. (P. H. Liotta, Pell Center for International Relations and Public Policy)	Will incorporate earlier in text
18-311	A	14	11	14	18	Sentences 1 and 2 are not connect to what follows (Dennis Tirpak, OECD)	Will revise
18-312	A	14	11	14	18	Insurance companies have relevance for both mitigation and adaptation. In areas in which Hurricanes occur insurance companies provide products, that are relevant for adaptation. If insurance companies would withdraw from such areas, this would have serious consequences for the people living in that area. On the other hand insurance companies play in an important role in mitigation: the way insurance companies invest their assets may benefit climate protection or increase greenhouse gas emissions. Furthermore in recent years, the insurance industry and the banking industry have come closer, increasing their financial power. (Martin Welp, Potsdam Institute for Climate Impact Research)	[good example for 18.4.1?]
18-313	A	14	12			adaptation is not usually the responsibility of centralised institutions. Instead, it is necessary to create networks of stakeholders who will collectively develop adaptive capacity. One link with mitigation is the knowledge of possible future climate states. (Jonathan Köhler, University of Cambridge)	OK; will add to section
18-314	A	14	13		13	agriculture and energy may be better examples than trade and economic ministries	Will consider alternate examples

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Susanne Moser, National Center for Atmospheric Research)	
18-315	A	14	15		15	replace "might screen" with "set building standards for" (Susanne Moser, National Center for Atmospheric Research)	Disagree
18-316	A	14	18		18	At the end of this paragraph, add: "others are being forced to do so through court cases or through stakeholder action" (growing literature on this in legal and economic journals) (Susanne Moser, National Center for Atmospheric Research)	[need references in order to include this]
18-317	A	14	20	14	20	Nagai and Hepburn is missing from the ref list (should use a linked biblio database); The CDM gold standard concept should logically be dealtt with here, as should the principles underlying the World Bank's BioCarbon Fund and Community Development Carbon Fund. (Henry David Venema, International Institute for Sustainable Development)	[?]
18-318	A	14	21			Delete 'through environmental policies' and replace with 'because of concerns about other issues such as energy security and environmental quality' (Dennis Tirpak, OECD)	OK
18-319	A	14	22	14	25	Is this well established enough to be included here; it surely cannot be a general finding? (Chris Hope, Judge Business School)	Is established enough to be included as an example
18-320	A	14	22	14	25	This is a fascinating and important point (Rachel Warren, School of Environmental Sciences)	Thanks
18-321	A	14	22	14	22	Nagai and Hepburn (2005) could not be found in the reference section. (Mitsutsune Yamaguchi, Teikyo University)	OK
18-322	A	14	25	14	25	Please read "than" and not then (Youba SOKONA, Sahel and Sahara Observatory (OSS))	OK
18-323	A	14	28			Section 18.3.4 The introduction of response capacity is only based on one literature source (page 15, line 2), and the text does not really explain what is meant by the concept. The strong conclusions that are drawn on development pathway/response capacity linkages on page 15, lines 34-43 are therefore not very convincing (Kirsten Halsnaes, Riso International Laboratory)	Will provide clearer explanation
18-324	A	14	28			Section 18.3.4 and 18.3.5. Do not see the specific topic of each one, for me it seems the same issue, perhaps a confusing element is that in both parts is not explicit whether they are related to the national or global level, the suggestion will be, to join both sections and clarify in the language which level is analysed (Patricia Iturregui, Consejo Nacional del Ambiente)	Will be clear in new outline
18-325	A	14	28	18	24	I like this section. It is well written and properly referenced. It might help to take the	Thanks

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						list of determinants on page 15 and create a table with mitigation and adaptation determinants in two different columns. It would also be useful to discuss data limitations and the fesability of actually monitoring trends. Unless this can be done in a practical way, response capacity will remain an academic concept. Currently, response capacity is politically 'loaded' and abused. It would be helpful if the IPCC could carefully define what it means and when it can be applied or should stop using it. I have not read other chapters, but I wonder whether this term has been introduced in an earlier chapter. (Dennis Tirpak, OECD)	Are re-writing text and will consider a new table.
18-326	A	14	37	14	39	repeats text included in box 18.1 (Patricia Iturregui, Consejo Nacional del Ambiente)	Will eliminate any redundancy
18-327	A	14	37		39	Why are you referring back to the TAR definition - use what's offered in Chapter 17 of the AR4. (Susanne Moser, National Center for Atmospheric Research)	OK
18-328	A	14	41		41	What does the "it" in "to which it might be exposed" refer to? Pls. clarify. (Susanne Moser, National Center for Atmospheric Research)	Solved by previous change
18-329	A	15	4		4	re: response capacity -- seems like you have just said that response capacity is the sum of adaptive and mitigative capacity" - one which quite a bit of work has been done and is underway, but then you say there hasn't been much work on RC yet. I'm confused... (Susanne Moser, National Center for Atmospheric Research)	Will clarify text
18-330	A	15	4			Address the need for political willingness to respond as a determinant, consistent with discussions on adaptive capacity elsewhere in the report (e.g. Chapter 20) (Rob Swart, MNP)	OK
18-331	A	15	7	15	19	18.3.4, pg. 15, lines 7-19: The fn. 2 is a bit mis-leading, since Chapter 20.3.2 also refers to adaptive capacity and draws from work by the same authors. Again, inter-textual reference is necessary but from which chapter and from whom seems yet to be decided. (P. H. Liotta, Pell Center for International Relations and Public Policy)	Disagree; ch 17 is the right source
18-332	A	15	21	15	29	Add to the list of reference: Goklany (1995, 2000, 2005b) (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Will look at references
18-333	A	15	21	15	32	the first serious discussion of links in detail. Expand. (Jonathan Köhler, University of Cambridge)	[expand?]
18-334	A	15	21		21	Specify that Yohe's work focused on the national level. (Susanne Moser, National Center for Atmospheric Research)	OK
18-335	A	15	34	15	43	The idea that both mitigative capacity and adaptive capacity will be a function of	Will mention earlier in text

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						development pathways is fairly obvious but important and should be made earlier in the chapter. Note, however, that this is not any more insightful than the TAR definition of Adaptive Capacity, which stated that enhancing adaptive capacity, "involves similar requirements as promotion of sustainable development" such as resource access, poverty reduction, increased equity and increased capability to participate in local politics and actions (IPCC, 2001c, p. 899). (Henry David Venema, International Institute for Sustainable Development)	
18-336	A	15	37	15	42	On line 36, add reference to Goklany (2005b); on line 43 add reference to Goklany (2005a) (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Will look at references
18-337	A	16	6			Figure 18.3 is unclear. Could be improved by moving the two circles (A & M) to the two arrow heads with two different combinations of magnitudes for A and M (one pathway a big A circle and a small M circle, and one pathway with a big M circle and a small A circle, depicting different balance between A and M in different paths) (Rob Swart, MNP)	Interesting idea; will consider
18-338	A	16	6		23	Figure 18.3 is very important, which was mentioned several times in the following text. But it seems not fit what it want to explain. (Shaohong WU, Institute of Geographical Sciences and Natural Resource Research, CAS)	Cf. 18-337; will redesign or eliminate figure
18-339	A	16	8			Figure 18.3: I also doubt if this is useful, though it is more readily understandable than Fig 18.2 (John Morton, Natural Resources Institute, University of Greenwich)	will redesign or eliminate figure
18-340	A	16	21			Figure 18.3 (the first one, not the second fig 18.3) does not make much sense or convey any information. Remove/replace? (Jonathan Köhler, University of Cambridge)	will redesign or eliminate figure
18-341	A	16	21			Figure 18.3 is not helpful. Either clarify what is a complex slide or delete. As it is, the graphic is not useful. (P. H. Liotta, Pell Center for International Relations and Public Policy)	will redesign or eliminate figure
18-342	A	16	21			Figure 18.3 what are the two development path directions. Is there a situation where there is a mitigation capacity without adaptation capacity? (Youba SOKONA, Sahel and Sahara Observatory (OSS))	will redesign or eliminate figure
18-343	A	16	26			Add Chapters 2 and 3. (Kirsten Halsnaes, Riso International Laboratory)	OK
18-344	A	16	38		42	Toth's development determinants is very limited - where are institutions, social norms, culture and customs?	Will add text

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Jonathan Köhler, University of Cambridge)	
18-345	A	16	44	18	24	This part was written by the CLAs and LAs not summarized from relative literatures. (Shaohong WU, Institute of Geographical Sciences and Natural Resource Research, CAS)	True but unavoidable since we are creating a framework in a new field Cf. 18-35
18-346	A	16	44			There are two figure18.3(s) here. Which one is being talked about. (Shaohong WU, Institute of Geographical Sciences and Natural Resource Research, CAS)	Will fix
18-347	A	16				Footnote 4 seems unnecessary, and is a repeat. (Susanne Moser, National Center for Atmospheric Research)	Will eliminate it
18-348	A	17	1	17	6	Response capacity in its general sense has to be further defined or the separation between adaptive and mitigative capacity should be maintained. (Kirsten Halsnaes, Riso International Laboratory)	OK; cf. 18-323
18-349	A	17	1	17	7	18.3.4, pg. 17, lines 1-7: Critical distinctions are made here regarding issues that are in their “infancy”; as with other critique items noted above, these issues need to more clearly highlighted and emphasized. (P. H. Liotta, Pell Center for International Relations and Public Policy)	OK; cf. 18-323
18-350	A	17	1	18	24	This section is really important and well written (Rachel Warren, School of Environmental Sciences)	Thanks
18-351	A	17	16	17	23	This conclusion is too strong and political in particular when no literature references are included. (Kirsten Halsnaes, Riso International Laboratory)	Disagree; paragraph as written is simply a logical argument
18-352	A	17	16	17	35	The discussion on lines 16-23 seems quiet adequate. I see no reason to include lines 25-36..it is trivial unneeded addition. I would also drop figure 18.3 with the 2x4 matrix. I am sure you realize that you have two figures labeled the same. (Dennis Tirpak, OECD)	Are rewriting discussion; may eliminate figure and explanatory text
18-353	A	17	16	17	23	Could add a positive example that a development pathway investing in research/development of new/existing technology is likely to reduce its emissions and increase adaptive and mitigative capacity (Rachel Warren, School of Environmental Sciences)	Will try to find example
18-354	A	17	17	26	26	In the text, this figure and subsequent ones are mis-labelled. It should be Figure 18.4, not 3 (Katharine Hayhoe, Texas Tech University)	OK
18-355	A	17	25	18	24	Figure 18.3 and its accompanying text doesn't add anything to the discussion (Chris Hope, Judge Business School)	Cf. 18.352
18-356	A	17	25	18	24	I doubt if the figure is necessary and feel the whole section could be shortened - it	ditto

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						essentially can be expressed in a few sentences (John Morton, Natural Resources Institute, University of Greenwich)	
18-357	A	17	26	17	26	it is fig 18.4 ? (Youba SOKONA, Sahel and Sahara Observatory (OSS))	OK
18-358	A	17	26	17	26	Should say Figure 18.4 (Rachel Warren, School of Environmental Sciences)	OK
18-359	A	17	27			notional should be national (Susan Cutter, University of South Carolina)	No, it is correct
18-360	A	18	1	18	9	Figure 28.3:Some examples are needed, in its present form the figure more looks like an overview of possible combinations. (Kirsten Halsnaes, Riso International Laboratory)	Disagree; it is exactly such an overview
18-361	A	18	1			renumber fig to 18.4 and subsequent figs. (Jonathan Köhler, University of Cambridge)	OK
18-362	A	18	10			Is ther a better wy to represent the concepts in figure 18.3? (Susan Cutter, University of South Carolina)	Cf. 18-352
18-363	A	18	10			Figure 18.3: which is the source of it? Is at the national or regional level? The level of vulnerability in the graphic should be considered, there is no distinction between developing and developed countries (Patricia Iturregui, Consejo Nacional del Ambiente)	OK
18-364	A	18	10	18	10	Fig 18.4 ? (Youba SOKONA, Sahel and Sahara Observatory (OSS))	OK
18-365	A	18	10			It would be interesting to add the 6 SRES scenarios to the 4 imaginary scenaros in Figure 18.3 (Rob Swart, MNP)	Are rewriting section; figure may be eliminated; if not, may adopt this suggestion
18-366	A	18	18	3	10	This figure illustrates one of the key conclusions of this chapter. While the discussion in the text is extremely clear and easy to follow, however, the figure needs to be clarified. Specifically, the negative values in the "Impacts" row refer to decreases in impacts (and hence in emissions) relative to what? I generally assume relative to current-day, which would make all impacts positive although some would be higher than others. This is obviously not the case, so the authors need to state relative to what basis they are supposing a reduction in impacts. (Katharine Hayhoe, Texas Tech University)	OK
18-367	A	18	18	39	41	The study by Cifuentes et al. that is cited later in the chapter also needs to be referred to here. (Katharine Hayhoe, Texas Tech University)	OK

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
18-368	A	18	18	10	10	In the figure captions, this figure and subsequent ones are mis-labelled. It should be Figure 18.4, not 3 (Katharine Hayhoe, Texas Tech University)	OK
18-369	A	18	20	18	20	Fig 18.4? (Youba SOKONA, Sahel and Sahara Observatory (OSS))	OK
18-370	A	18	24		24	At the end of this paragraph, you may add a sentence on how scalar and geographic variation will be one way in which this will be made more complex. (Susanne Moser, National Center for Atmospheric Research)	Will consider
18-371	A	18	27			18.3.5. It should be mentioned that climate change threatens development, specifically the achievement of the Milenium Development Goals, as expressed by the Multi Agency paper on poverty and climate change (2003) (Patricia Iturregui, Consejo Nacional del Ambiente)	Will check reference and add if appropriate
18-372	A	18	27	20	11	18.3.5 Adaptation, mitigation and sustainable development. This important section is very well written and well balanced. One point to consider, however, is to check the contents of Chapter 12, WG 3 (Sustainable development and mitigation) whether there are any duplication in descriptions. (Mitsutsune Yamaguchi, Teikyo University)	Thanks Have checked ch 12
18-373	A	18	29	20	11	A generally good section, but given comment 9 above, (the futility of top-down analysis to analyse M-A tradeoffs), this section should have far more prominence. The urban food exanple is good, but should be complemented by the examples in comment 7; the rural energy issue should be fully developed (see World Energy Council, 2004 work). (Henry David Venema, International Institute for Sustainable Development)	[Add rural energy example?]
18-374	A	18	32	18	33	I would add to this list: Goklany (1995, 2000, 2003, 2005b) (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Will look at references
18-375	A	18	32			Add Munasinghe, M. and R. Swart, 2004. Primer on Climate Change and Sustainable Development, Cambridge University Press; refer to chapter WG2 20 and WG3 12. (Rob Swart, MNP)	OK
18-376	A	18	50			the phrase " will be extremely difficult and expensive to achieve stabilisation targets below 650 ppm" etc deserves a better explanation and a graphic (Patricia Iturregui, Consejo Nacional del Ambiente)	Will elaborate
18-377	A	19	10	19	11	Change "might" on line 10 to "would". References: Goklany (1995, 1999a, 2003) (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Disagree; “might” is appropriate, cf. 18-377; Will look at references
18-378	A	19	10	19	20	Several studies from the AIACC project lend support for hypothesis that investments that promote sustainable development (e.g. in publich health education, sanitation,	Will add references

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						vector control) decrease vulnerability to climate variability, climate extremes and climate change. A synthesis paper from the AIACC project should be available before the Merida meeting and will be made available to the WG2 TSU. (Neil Leary, International START Secretariat)	
18-379	A	19	10	19	15	Example of sustainable development in low lying coastal regions …surely the sustainable development would be to avoid building in low lying coastal regions at all, so encouraging further economic development away from the coasts would increase their adaptive capacity rather more. (Rachel Warren, School of Environmental Sciences)	[No response necessary?]
18-380	A	19	12			Insert the following sentence: "In a complementary approach, Goklany (1999a, 2000, 2003, 2005) also recommends proactive measures to reduce the vulnerability to climate-sensitve problems (e.g., hunger, malaria, water shortage) that might be aggravated by climate change, noting that this, in turn, would also advance sustainable development because many of these problems are themselves barriers to sustainable deevlopment." (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Will look at references and decide
18-381	A	19	14		14	"decrease vulnerability" - that is contestable. At best, because of socioeconomic and demographic changes, we will be able to "avoid increasing vulnerability", but I will question anyone on whether we can actually decrease it. See also the very good discussions on this in Chapter 6 of WG2 on coastal areas. (Susanne Moser, National Center for Atmospheric Research)	But cf. 18-377
18-382	A	19	22		29	A very good argument here. Is there any literature on this specifically? (Jonathan Köhler, University of Cambridge)	Will check
18-383	A	19	25	19	29	Replace the sentence beginning on line 25 to the end of that para with the following: "Following this logic, and noting that many of the determinants of adaptive and mitigative capacities (e.g., availability of technological options, and access to economic resources, social capital and human capital) not only overlap but also serve as indicators of sustainable development (e.g., per capita income; and various public health, education and research indices), Goklany (2005b) identifies integrated approaches to formulating strategies and measures to concurrently advance adaptation, mitigation and sustainable development. These approaches range from broadly moving sustainable development forward (by developing and/or nurturing institutions, policies and infrastructure to stimulate economic development, technological change, human and social capital, and reducing specific barriers to sustainable development) to reducing vulnerabilities to urgent climate-sensitive risks that hinder sustainable development and would worsen with climate change. He also notes that the resulting	Will look at references; and add some text

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						sustainable economic development would also help reduce birth rates, which could mitigate climate change and reduce the population exposed to climate change and climate-sensitive risks, thereby reducing impacts, and the demand for adaptation." (Indur Goklany, Office of Policy Analysis, Department of the Interior)	
18-384	A	19	33			Add to refernces: Goklany (1999a), and insert "most" before "early work". (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Will look at references
18-385	A	19	33		35	Well, I would say that the NRC report, Our Common Journey, in 1999 made that point rather clear, and if I recall correctly, so did the Pathways report from the NRC. This may be a bit overstated! You're right that we're not tackling it with the same level of effort in which we hope that technolgy will save us, but there are some influencial reports and studies that make that point. If you look through academic journals that deal with environmental education, ethics, environmental psychology or sociology -- they are all full of it too. It's just that in the climate (impacts) community we rarely go over to that aisle of the library.... (Susanne Moser, National Center for Atmospheric Research)	OK; will add NRC and other references, and change text accordingly
18-386	A	19	37			Add to reference: Goklany (1999a). (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Will look at references
18-387	A	19	37	19	38	and fn 8: see recent work by Neil Thin on whether the "three pillars" image is useful (John Morton, Natural Resources Institute, University of Greenwich)	Disagree; don't need more on sustainable development as a concept
18-388	A	19	41		44	you may also want to cite the Millennium Ecosystem Assessment's synthesis report(s) - they actually make this point ever so clearly! (Susanne Moser, National Center for Atmospheric Research)	OK
18-389	A	20	0			3. Discussion on p20 is confusing in that some examples don't seem to link mitigation and adaptation. In general the chapter needs a clearer discussion of the two main scales at which mitigation and adaptation have been linked – firstly within the global IA models that (have the ability) to explore both mitigation and adaptation options (e.g. different emission scenarios and different agricultural adaptations such as water) and secondly within a wide range of local and regional climate change studies where both mitigation and adaptation are discussed 4. I think that one of the most important areas where mitigation and adaptation are linked is in the way that awareness and action on one leads to awareness and action on the other. This has become clear through stakeholder focused projects such as UKCIP and the NOAA regional assessment programmes where working on climate adaptation leads to a more serious approach to mitigation. One of the reasons as well that non nation state actors are starting to commit to mitigation. (Diana Liverman, Oxford University)	

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
18-390	A	20	11			Add to reference: Goklany (1999a). (Indur Goklany, Office of Policy Analysis, Department of the Interior)	
18-391	A	20	16			Section 18.4.1: serious flaw is lack of reference to crucial issues of inter-regional and inter-generational considerations including discounting. (Tom Kram, MNP-RIVM)	No room to go into the technical details of these DAFs, reference added on discounting.
18-392	A	20	16			Section 18.4.1 There is a great deal of meat in this section which does a good job. Table 18.1 is very helpful. Personally, I would have split "trade-offs" and "synergies" into separate sections. The trade-offs literature in my view tends to take a macro perspective with an implicit or explicit cost-benefit framework. I would have expected more reference to the "integrated assessment modelling" literature here. The synergies literature tends to be more micro/meso in terms of scale. I thought this was covered rather well. (Jim Skea, UK Energy Research Centre)	Various options to organize the material. Trade-offs-synergies not really macro-micro divisions, both linkages exist in both domains. No action.
18-393	A	20	16			Having read section 18.3.5 (which I also liked), I looked at the title of this section and immediately became confuse, because I thought I had just been reading about 'tradeoffs and synergies' …something for you to consider. As I read on... I realized that this section was describing various methodological approches to assessing what are quiet different tradeoffs. Lines 18-22 provide little context for what follows, therefore a new introduction should be drafted to lay out the issues properly. (Dennis Tirpak, OECD)	Introduction revised.
18-394	A	20	18			division of views on the links between adaptation and mitigation is not related to any reference, this part is one of the most important parts of the chapter and should be clearly stated. Should be included last thoughtful analysis that compensation duties to developing countries will trigger mitigation action, as last book published from Dr. Roda Verheyen. See also the idea of adaptation allowances as a system that provides a dedicated annual source of funding for climate change adaptation, within the system, Parties must accrue a specific number of adaptation allowances each year. This idea is expressed by the Center for Clean Air Policy (see website www.cccap.org)Option for Funding Adaptation through an Adaptation Liability Jake Schmidt, International Program Manager Mark Houdashelt, Policy AnalystCenter for Clean Air Policy Dialogue on Future International Actions to Address Global Climate Change (Patricia Iturregui, Consejo Nacional del Ambiente)	Reference: Details follow in subsequent paragraphs. Verheyen book relevance is not clear. Set-aside addressed earlier. No action.
18-395	A	20	18	20	42	Tol (forthcoming, Environment and Development Economics) shows that climate change induced malaria is better avoided by investing in development than by investing in greenhouse gas emission reduction. Tol (forthcoming, Mitigation and	Added.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						Adaptation Strategies for Climate Change) shows that these results for malaria do not carry over to sea level rise and coastal zone management. (Richard S.J. Tol, Uni. Hamburg)	
18-396	A	20	18	20	23	The need for more research on disaggregated methods to elaluate the costs of climate change should be stressed here (as an alternative to cost-benefit analysis). (Martin Welp, Potsdam Institute for Climate Impact Research)	CBA does not evaluate the costs of CC, damage functions do. Costing methods not an issue here. No action.
18-397	A	20	20	44	45	Can you provide basic references for TWA and ICLIPS? (Katharine Hayhoe, Texas Tech University)	P21, line 5; moved forward.
18-398	A	20	24	20	32	18.4.1, lines 24-32: As with earlier critiques that suggest that U.S. non-participation or that do not emphasize U.S.-centered data, the points made here are crucial and should not be embedded. (P. H. Liotta, Pell Center for International Relations and Public Policy)	Agree: No US centered data are emphasized here. The crucial points are made and are not embedded here. No action.
18-399	A	20	24			It would be useful to clarify which of the categories in the previous para RICE fits into. Does the finding have relevance to the mitigation - adaptation interaction? (Ian Noble, The World Bank)	Yes, CBA balances A-M action at the margin. No action.
18-400	A	20	24	20	42	1) Why are these two different results juxtaposed in this para? 2) Also, the para lacks balance between Nordhous and Tol. 3) There is no discusson of the key assumptions and limitations of either model. 4) What message is the reader suppose to take away from this para? (Dennis Tirpak, OECD)	1) Because they illustrate different applications of CBA. 2) Shares are balanced: Tol published more applications. 3) No room, reference to CBA criticism added. 4) Lessons explained.
18-401	A	20	24	20	42	Add "and cost benefit analysis requires conversion of many different damages to a common metric, and if that is through monetisation then inevitably subjective judgements about the values of very different benefits relative to each other, and differing opinions about the appropriate choice of a discount rate, imply that such analysis is controversial" and cross reference WGIII Ch 3 section 3.5. Further more the damages of climate change may well be experienced mainly due to the impacts of extreme weather events which are typically omitted from CBA anslyses and also very difficult to predict. The use of high discount rates means that long-time-scale earth system transitions of momentous consequence such as melting of ice sheets, collapse of the thermohaline circulation or the release of methane clathrates have almost no weight in a CBA analysis whilst they would be clearly of great importance to policy makers. (Rachel Warren, School of Environmental Sciences)	These are covered by the reference dealing with the shortcomings of CBA for CC – see 18-400 action. No further action.
18-402	A	20	25	20	25	Please explain the acronym RICE (Youba SOKONA, Sahel and Sahara Observatory (OSS))	Explained.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
18-403	A	20	28	20	38	These sentences purport to say something about trade-offs between mitigation and adaptation. However,what the example is really about are secondary effects of mitigation that operate through changes in income. This has implications for adaptation. But they are not made explicit. Suggest that the authors either revise to emphasize the adaptation linkage or delete the example. (Neil Leary, International START Secretariat)	Indirect linkage emphasized.
18-404	A	20	28	20	41	repetition on page 20, bottom: delete here (Rob Swart, MNP)	Not clear what repetition.
18-405	A	20	29	20	29	Please explain the acronym FUND (Youba SOKONA, Sahel and Sahara Observatory (OSS))	Explained.
18-406	A	20	38	20	42	Global cost-benefit analyses are also criticized on the grounds that they are based on the premise that it is possible to aggregate individual welfares into a global welfare function that is universally recognized as valid. If one does not accept that premise, then the guidance for optimal climate policy that can be derived from global cost-benefit analyses is very limited. This criticism should be noted as well. It is partly related to issues of equity, but also to Arrow's impossibility theorem: social welfare cannot be measured (and by implication a global optimum cannot be uniquely identified) without accepting very implausible restrictions on the measurability and comparability of peoples preferences and well-being. (Neil Leary, International START Secretariat)	See 18-400 response.
18-407	A	20	38	20	42	What is your assessment? - at least refer to the previous chapter. (Ian Noble, The World Bank)	Assessment added. (useful information but no basis for decision-making).
18-408	A	20	42		42	Some references and examples would be really good here. (Susanne Moser, National Center for Atmospheric Research)	See 18-400 response.
18-409	A	20	44	21	8	Please replace “emission fields” by the technical term “emissions corridors” several times. (Thomas Bruckner, Technical University of Berlin)	OK
18-410	A	20	44	21	8	Focus on specific model, not on methodolgy. Teeming with "un-scientific" wording like unacceptable, intolerable, etc. without any clue as to how these help in actual decision making processes. (Tom Kram, MNP-RIVM)	TWA is methodology, ICLIPS is model. TWA was implemented in other models. Clues are in references – this is emphasized now.
18-411	A	20	44	21	8	Presently there are no estimates of which I am aware of the adaptation expenditures that would be required to increase the magnitude of climate change that can be tolerated. This substantially limits the practical utility of TWA for now. This limitation should be made clear in the text.	OK

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Neil Leary, International START Secretariat)	
18-412	A	20	44			Please clarify the relationship between the TWA and the ICLIPS model for the novice. Redraft the first two sentences. (Dennis Tirpak, OECD)	OK
18-413	A	20	44	21	8	Comment on whether TWA includes dynamics - in particular that with increased near term emissions rates of change of temperature are faster and so climate impacts for the same temperature rise are greater. (Rachel Warren, School of Environmental Sciences)	No demonstrated impact between rate of temp change and impacts in literature. TWA/ICLIPS can handle dT/dt constraints. No action.
18-414	A	20	45		47	needs reference (Susanne Moser, National Center for Atmospheric Research)	References moved forward.
18-415	A	21	0	22		improve structure of this key policy-relevant section, e.g. illustrate the issues with a figure/matrix with examples of synergies and trade-offs between mitigation and adaptation (4 cells with options organized according to +/+, +/-, -/+, -/-); possibly organize table 18.1 according to the sectors on pages 22-23 (dropping the text there) (Rob Swart, MNP)	To be discussed with WT.
18-416	A	21	1	21	2	statement seems contradictionary (Stephan Lingner, Europäische Akademie GmbH)	It is not. No action
18-417	A	21	1	23	34	5. Extensive repetition on p21-23 (Diana Liverman, Oxford University)	To be clarified with TD/WT.
18-418	A	21	8	21	8	should read: "… cannot provide an economocally optimal policy." (Stephan Lingner, Europäische Akademie GmbH)	OK
18-419	A	21	8			unlike CBA, it does not provide a theoretical optimal policy (Rob Swart, MNP)	Economically – added.
18-420	A	21	10			Insert "generally" before "depict". (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Why? No action.
18-421	A	21	10	21	16	This could come across as a rather off-hand dismissal of CEA. At least provide some supporting views or a cross reference to the previous chapter. (Ian Noble, The World Bank)	It should not. Importance emphasized – irrelevance for AM linkage as well.
18-422	A	21	10			remote'…do you really want to use this word? (Dennis Tirpak, OECD)	Why not? No action
18-423	A	21	11			Replace "They" with "Most such studies…" (Indur Goklany, Office of Policy Analysis, Department of the Interior)	OK: CEA studies …
18-424	A	21	11	21	11	refer to: Yohe, G.; Andronova, N.; Schlesinger, M. (2004): To hedge or not against an uncertain climate future? In: Science, Vol. 306 (15 Oktober 2004), 416-417 (Stephan Lingner, Europäische Akademie GmbH)	M-A linkage is not the point in Yohe et al. No action.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
18-425	A	21	15			Insert a new sentence at line 15 as follows: "In a similar vein, Goklany (2000, 2003, 2005), employng reductions in the magnitude of various climate-sensitive hazards as measures of effectiveness, compares the cost-effectiveness of various adaptation and mitigation approaches (e.g. the Kyoto Protocol and different stabilization scenarios) over the next few decades. He concludes that for the next few decades, adaptation may be the most cost-effective method to reduce damages from such hazards, even if in the long term mitigation may be inevitable.." See also comment 19. (Indur Goklany, Office of Policy Analysis, Department of the Interior)	TO DO: check references
18-426	A	21	18			This paragraph needs more development. (Susan Cutter, University of South Carolina)	Details and examples follow in subsequent paragraphs. No action
18-427	A	21	20			I don't understand the specific, bracketed reference to LU related activities here (Ian Noble, The World Bank)	Add: e.g.,, details in next paragraph.
18-428	A	21	21	20	20	Are land use activities the only type of mitigation projects that foster or hinder adaptation? I think not. Need to be clear that this is just one example. (Katharine Hayhoe, Texas Tech University)	OK
18-429	A	21	23	21	28	This idea is repeated on page 23 lines 1 to 3. (Patricia Iturregui, Consejo Nacional del Ambiente)	OK – removed repetitions from p 23.
18-430	A	21	23		41	There are numerous studies on the C and N cycles out in recent years that suggest limited and declining capacity of terrestrial systems to store carbon, and additional studies have examined the interaction between afforestation and reforestation and biodiversity - some came out around the COP negotiations over Kyoto mechanisms. (Susanne Moser, National Center for Atmospheric Research)	Point is not declining capacity but the A-M linkage. No action.
18-431	A	21	23	21	28	I suspect that this text is based on an article in the Economist for which the Economist later issued a rare "clarification". If this is the case the authors should cite the source they consulted. What Mayorga et al showed was that the high outgasing rate of CO2 in the Amazon rivers probably originates from recently fixed carbon much of which, they suggest, derives from recent deforestation. It does not imply, as does the text here and the original economist article, that carbon from afforestatio/reforestation is released in 5 years. Issues like this should be pursued in greater depth. (Ian Noble, The World Bank)	Clarified, explained, revised.
18-432	A	21	23		41	I found this para to be very imbalanced, drawing on a very selective set of what is a rich literature. For example, the negative aspects of afforestation are properly noted, but none of the positive…e.g., prevention of soil losses and flooding. This para also deals with tradeoffs in a very different context than the Tol/Nordhaus, another reason for setting a proper context at the begining. (Dennis Tirpak, OECD)	OK to both: positive effects and better explanation at the beginning.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
18-433	A	21	23	21	41	This paragraph is extremely problematic and based on very limited literature - I suggest it be removed or balanced with the ecosystem- research described in comment 7 and more development-ecosystem literature (especially the IDRC ecosystem mgmt research and joint forest management/watershed management literature from India, which documents very beneficial hydrologic response to Integrated Watershed Mgmt/Afforestation). Important examples include WinRock India's analysis of watershed mgmt for drought resilience: http://www.winrockindia.org/reportnrm_s.htm ; note the quote: "reatment of upstream degraded forest areas imperative for maximizing impact of watershed program". See also: http://www.winrockindia.org/nrm/wedo2wru.htm . The point is that among the development NGOs who actually do watershed mgmt for climate and drought resilience, improved forest and vegetative cover has been demonstrated as essential to improved water availability. A more academic treatment of the subject is available from Moench and Dixit (2004) "Adaptive Capacity and Livelihood Resilience". In general This section should be written after the special issue on Mitigation-Adaptation linkages in MITI appears. Recall Parry et al 2001 in GEC which pointed out billions who will be vulnerable to water and food insecurity. (Henry David Venema, International Institute for Sustainable Development)	More literature assessed, including MITI SI.
18-434	A	21	23		41	Aforestation and reforestation have negative effect in mitigation under some particular conditions. But it should clarify two things: firstly how many this "particular conditions" will be, and secondly the negative effect will be what a propotion compared with the positive. (Shaohong WU, Institute of Geographical Sciences and Natural Resource Research, CAS)	OK See 18-433 response
18-435	A	21	24	21	28	The study appears to have shown that the forest does not act as a carbon sink, but leaving it intact means that it is not a carbon source hence it is still a mitigation option (Rachel Warren, School of Environmental Sciences)	Revised - See above.
18-436	A	21	28	21	31	Here the authors touch upon an important issue, but again without much depth. The source is not listed in the references, but I am aware of several publications in the grey literature. It may come from "Water Mountain to Tap" published by DFID this year. But this is a "op ed" piece (and in my view a good one) making the case for a rethinking of the way water management and reforestation are handled. There has been a upsurge in interest in this issue in the past year or so, but given its importance why isn't it dealt with in some detail? Surely a claim that reforestation (a common mitigation tactic) and water yields & flood protection are to a degree incompatible, deserves a proper treatment - especially in this chapter. While, I am sympathetic to the	Additional literature assessed and text revised on the new basis.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						main thrust of Ian Calder's arguments (why wasn't he cited directly?), I would have hoped to have seen a thorough assessment of the range of applicability and a discussion of some of the "apparent" contradictions (e.g. forests rob the catchment of water by intercepting it and evapotranspiring it, and forests do not hinder water flow leading to floods). Again, the assessment component of the essay is missing. (Ian Noble, The World Bank)	
18-437	A	21	32			In Japanese traditional rural life, special forests near vilagges, which was called "Satoyama" (translated as "settlement forest") was artificially maintained by village people, and provided fuel and various kinds of food, medicines (mashroom, wild vegetables etc.) to append variety of village life. The kind of trees were quite different from that of homogeneous forest for timber, and quite varied and provided food also for many kinds of animals. Maintenance of "Satoyama" declined after introduction of electricity, kerosene and gas (urbanization of rural life). However very recently, value of Satoyama is recognized by urban people, and many volunteer groups are trying to recover the previous Satoyama throughout Japan. There are plenty of publishing on this topic. (Hideyuki Kobayashi, Ministry of Land, Infrastructure and Transport)	Not clear how is this related to A-M linkage. No action.
18-438	A	21	32	21	41	Reforestation and biodiversity. It is correct that reforestation may have a negative effect on biodiversity if land managers choose to plant fast growing exotic species because of the incentives provided by the CDM, and if the land used had other biodiversity value, or if the exotics are invasive, or if the exotics are planted in a situation where native species would have normally been selected. (Note that Caparros & Jacquemont conclude in the same paper that forest management may have little or a positive effect on biodiversity, but a spot was not found for this conclusion in this essay.) But how representative is their analytical model with all its assumptions and approximations of the real world? Do project proponents in the CDM really only make a decision between a fast growing exotic and more biodiversity favoured species? How do additionality rules affect the decisions in the CDM? Did the authors make any attempt to look at the realism of the Caparros & Jacquemont analysis? The authors obviously view this single paper as a core paper on reforestation and biodiversity as they reject all others on this issue including the CBD/IPCC's own Tech Report. Even given their rejection of the IPCC Tech Rep I would have expected some assessment as to why the IPCC effort provided no valuable information. Readers should at least be warned away from it with appropriate reasoning if that is the considered view of this assessment. (Ian Noble, The World Bank)	Additional literature assessed and text revised on the new basis.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
18-439	A	21	36		39	The evidence should be cited and properly referenced or the sentence should be dropped as it is speculative. (Dennis Tirpak, OECD)	OK citation added.
18-440	A	21	43	22	7	This is another paragraph of mostly unsubstantiated opinion rather than an assessment. The train of argument is also hard to follow. We jump from negative adaptation effects on mitigation, then the effects of CC on energy requirements, then "mitigation rebound", whatever that is. (Ian Noble, The World Bank)	Revised to make it clear: we go through the matrix : A +/- M; M +/- A
18-441	A	21	43	22	44	another part of without citation. (Shaohong WU, Institute of Geographical Sciences and Natural Resource Research, CAS)	ADDITIONAL citations added.
18-442	A	21	50	22	2	This study does not seem relevant, as it is the contribution of adaptation to energy demand that is being discussed (Chris Hope, Judge Business School)	Revised to make it clear: we go through the matrix : A +/- M; M +/- A
18-443	A	22	1	22	2	The citation may need addendum in light of the drastic change in fuel oil prices that have occurred in the USA just since the hurricane season of 2005. Energy demand may not stay constant as decisions must be made between travel choices and home/office temperature needs because of a rapidly increasing domestic cost for fuel, artificial though it may be. Because of poor distribution of fuel processing and storage and regional vulnerabilities to increasing extremes of weather, standard estimates of price increases may no longer be viable. (Suzanne Bolton, National Marine Fisheries Service/NOAA (ST7))	With higher fuel prices, the CC contribution to energy demand will be even less. No action.
18-444	A	22	1			You should not rely on just one study..at the beginning of time, Smith and Tirpak included an analysis of this issue (I am not plugging for a reference)…I seem to recall an EPRI study and and more recently by C. Philibert of IEA has written a paper. (Dennis Tirpak, OECD)	OK, citations added.
18-445	A	22	5			Perhaps a sentence or phrase got left out on line 5 -- where the text suddenly mentions "this mitigation rebound." By that, I presume you mean the normal behavioral response that as energy efficiency increases so does its use? (Indur Goklany, Office of Policy Analysis, Department of the Interior)	"mitigation rebound" eliminated, replaced by a simple discussion that some adaptation actions involve fossil energy use, hence increase GHG emissions.
18-446	A	22	9	22	9	Figure 18.5? (Youba SOKONA, Sahel and Sahara Observatory (OSS))	Noted. Will clarify
18-447	A	22	12	22	13	what does "scaling up to sustainable livelihoods mean" (John Morton, Natural Resources Institute, University of Greenwich)	Noted. Will clarify
18-448	A	22	14		15	Wow - where does this claim come from? Most places (communities, organizations,	Noted. Will clarify

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						businesses, US states) that I know in more detail in 95% of the cases are NOT primarily driven by climate change. So I find this to be a complete overstatement. Most often, actions are taken for different purposes (i.e., that is the main context), but can have climate change mitigation (or adaptation) benefits (the side show). (Susanne Moser, National Center for Atmospheric Research)	
18-449	A	22	17			Regarding "tourism", although clearly that can be locally imporatant, on a global basis I suspect tourism will just shift to more hospitable climes. It might be very close to "zero sum" game, as a first order approximation. (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted. Will clarify
18-450	A	22	23	48	5	This section is a repeat of text that appears on p. 21. Perhaps the examples could be moved closer to the general discussion so the earlier repetitive text can be removed (thus reducing the overall size of the chapter). (Katharine Hayhoe, Texas Tech University)	Noted. Will clarify
18-451	A	22	23	22	23	you may refer to: P.C. Benitez-Ponce (2005) Essays on the economics of forestry-based carbon mitigation. Wageningen University, The Netherlands (Stephan Lingner, Europäische Akademie GmbH)	Noted. Will clarify
18-452	A	22	30	22	31	The CDM surcharge is rather a political decision and did not constitute an explicit linkage between mitigation and adaptation (Youba SOKONA, Sahel and Sahara Observatory (OSS))	Noted. Will clarify
18-453	A	22	32	22	33	How capacity building constitute a critical linkage between adaptation and mitigation? To my knowledge le National Capacity Self Assessment exercise is not directly related to climate change (Youba SOKONA, Sahel and Sahara Observatory (OSS))	Noted. Will clarify
18-454	A	22	33		34	This last sentence seems like too little to capture the full impact of trade on emissions. For example, research is now appearing that shows that the outsourcing of manaufacturing from the US to China is increasing emissions (as opposed to if the same materials were manufactured back in the US); and trade itself - the transportation involved - is a major source of emissions. So this needs some beefing up. (Susanne Moser, National Center for Atmospheric Research)	Noted. Will clarify
18-455	A	22	38			"Geoengineering is a special case…". This needs much more explanation as there are many different types of geoengineered solutions. (Susan Cutter, University of South Carolina)	Noted. Will clarify
18-456	A	22	38	22	38	Reference should be made to where "geoengineering" is covered in the IPCC report, and if not in AR4 to the chapters in the SAR and TAR on this. (Michael MacCracken, Climate Institute)	Noted. Will clarify

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
18-457	A	22	38			Please explain the special reference to geo-engineering. (Ian Noble, The World Bank)	Noted. Will clarify
18-458	A	22	39	22	40	Legal liability for adaptation is a huge issue in the climate negotiations and in development assistance. Is this all we are going to get? The only other references are in the Fig, Table and one reference. This is a major omission from a chapter on adaptation - mitgation interactions. (Ian Noble, The World Bank)	Noted. Will clarify
18-459	A	22	41			After "prospects of liability" you should cite some of the pertinent legal literature - quite a bit out there now. (Susanne Moser, National Center for Atmospheric Research)	Noted. Will clarify
18-460	A	22	42			plays a role in who's awareness? - this whole paragraph seems strong on claims and weak on references to back them up. Needs strengthening. (Susanne Moser, National Center for Atmospheric Research)	Noted. Will clarify
18-461	A	22	48	23	5	The same paragraph was used previously in the document on page 21 (lines 23 through 32) with no modifications or changes. Certainly, there are other examples or this one reference could be cited in another way than simply repeating language already used. The chapter, as a whole, suffers from too much general discussion and too few examples to better explain the generalities. (Suzanne Bolton, National Marine Fisheries Service/NOAA (ST7))	Noted. Will clarify
18-462	A	22	48	23	1	Repeats 21 24-28. (Chris Hope, Judge Business School)	Noted. Will correct
18-463	A	22	48	23	5	These points were already made on page 21, line 23. (Neil Leary, International START Secretariat)	Noted. Will correct
18-464	A	22	48	23	34	redundancy to the respective paragraphs from pages 20 -22. (Stephan Lingner, Europäische Akademie GmbH)	Noted. Will correct
18-465	A	22	48	23	34	This section is directly repetitive of material on pp.22-22 (John Morton, Natural Resources Institute, University of Greenwich)	Noted. Will correct
18-466	A	22	48	23	34	Whole section is a repeat of stuff that was said in the preceding pages. (Susanne Moser, National Center for Atmospheric Research)	Noted. Will correct
18-467	A	22	48	23	5	Repetative of Page 21 (Ian Noble, The World Bank)	Noted. Will correct
18-468	A	22	48	23	11	Why repeating here page 21 from line 23 to line 39? (Youba SOKONA, Sahel and Sahara Observatory (OSS))	Noted. Will correct
18-469	A	22	48	23	34	Duplicative material…you've just saved 3/4 of a page! (Dennis Tirpak, OECD)	Noted. Will correct

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
18-470	A	22	48	23	34	text is repeated (Rachel Warren, School of Environmental Sciences)	Noted. Will correct
18-471	A	22	48	23	5	completely repeating the text from page 21 line 24 to line 32. (Shaohong WU, Institute of Geographical Sciences and Natural Resource Research, CAS)	Noted. Will correct
18-472	A	22	48	23	34	Duplication with previous sentences (Mitsutsune Yamaguchi, Teikyo University)	Noted. Will correct
18-473	A	23	0			why repeat these examples? (Elizabeth shove, Lancaster University)	Noted. Will correct
18-474	A	23	7	23	11	Once again the paragraph is verbatim for one iused on page 21 (lines 32 through 39) with the exception of an additional sentence in the first citation (lines 34-36) (Suzanne Bolton, National Marine Fisheries Service/NOAA (ST7))	Noted. Will correct
18-475	A	23	7	23	11	These points were already made on page 21, line 32. (Neil Leary, International START Secretariat)	Noted. Will correct
18-476	A	23	7	23	11	Also repetative. Please assess how realistic this claim is. The Caparros work is at least 3 years old and we have a stream of actions in place leading up to the 1st CP. Why haven't these activities been assessed to see how realistic the assumptions of this one particular paper have proven to be. (Ian Noble, The World Bank)	Noted. Will correct
18-477	A	23	7	23	11	Of course theoretically reforestation and afforestation activities could be negative (better not positive) for biodiversity on a species level. But we should take into consideration other positive results of these activities for microclimate, soil water regime, finally on biodiversity on the ecosystem and ladscape level. the paragraphs must be balanced. (Andrey Sirin, Institute of Forest Science Russian Academy of Sciences)	Noted. Will clarify
18-478	A	23	7	23	11	The paragraph is unbalanced - see for example the Convention on Biological Diversity work on biodiversity-climate linkages, and http://www.grida.no/climate/ipcc/land_use/285.htm . Community-based approaches can combine reforestation/afforestatin and improved biodiversity - see also the joint forest management and adaptive co-management literature. (Henry David Venema, International Institute for Sustainable Development)	Noted. Will clarify
18-479	A	23	7		11	repeating the text from page 21 line 32 to line 34 and line 36 to line 39. (Shaohong WU, Institute of Geographical Sciences and Natural Resource Research, CAS)	Noted. Will correct
18-480	A	23	13	23	24	18.4 Inter-relationships between adaptation and mitigation: Expert Reviewer strongly	Noted. Will clarify

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						suggests that the following sentence should be inserted in the text. 1) There are some Peak Oil Scenarios are available, therefore projected scenarios on CO2 emission and temperature increase should be revised in near future. (Mitsuru ANDO, Toyama University of International Studies)	
18-481	A	23	13	23	24	Again, the paragraph is verbatim of the same on pages 21 (lines 45 through 50) and page 22 (lines 1-7) (Suzanne Bolton, National Marine Fisheries Service/NOAA (ST7))	Noted. Will correct
18-482	A	23	13	23	24	These points were already made on page 21, line 43. (Neil Leary, International START Secretariat)	Noted. Will correct
18-483	A	23	13	23	24	More repetition (Ian Noble, The World Bank)	Noted. Will correct
18-484	A	23	18	23	34	Repeats earlier text word for word (Chris Hope, Judge Business School)	Noted. Will correct
18-485	A	23	23	18	24	Same (repeated text). (Katharine Hayhoe, Texas Tech University)	Noted. Will correct
18-486	A	23	26	23	34	18.4 Inter-relationships between adaptation and mitigation: 1) This report should not be correct. It is necessary to cite Chapter 8, Human Health. (Mitsuru ANDO, Toyama University of International Studies)	Noted. Will clarify
18-487	A	23	26	23	34	With the exception of slight modification in the first two sentences, the section is verbatim for the earlier account on page 20 (lines 30 through 38.) Page 23 is a good place to begin editing to greatly reduce repetitive material and maybe bring in other examples outside of these four papers. (Suzanne Bolton, National Marine Fisheries Service/NOAA (ST7))	Noted. Will correct
18-488	A	23	26	23	34	18.4.1., pg. 23, lines 26-34: An absolute crucial weakness here. Without defining constant or inflation-adjusted dollars, there is an extremely weak overall claim that "people with an annual income of USD 3,000 or more do not die of malaria." This claim is by far the weakest assertion of the chapter—based on what year? On what criterion/criteria? To suggest that a vast majority of countries will reach this level, even as overall adjustments constantly rise in terms of purchase power parity, approaches the ludicrous. (P. H. Liotta, Pell Center for International Relations and Public Policy)	Noted. Will clarify
18-489	A	23	26	23	34	This study has important implications. It could be interpreted as suggesting that for developing countries rapid development without concerns for mitigation could lead to greater ability to cope with CC than becoming engaged in mitigation. If space is the problem, surely this is worth more space and more analysis than it is given here. It is	Noted. Will clarify

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						far more important that the earlier material in section 18.3. (Ian Noble, The World Bank)	
18-490	A	23	26	23	33	Repetitive. (Richard S.J. Tol, Uni. Hamburg)	Noted. Will correct
18-491	A	23	28			Change "IS92 scenarios" to "IS92 and SRES scenarios". (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted. Will correct
18-492	A	23	35			Add another new para here: "Hunger, Freshwater Biodiversity and Water Shortage. Similarly, increasing the economic efficiency of water use by the food and agricultural sector (in terms of the amount of usable food produced per liter of water) would make progress concurrently on reducing hunger, conserving freshwater biodiversity and ameliorating water shortages (Goklany 1998, 2000, 2005). Approaches based on this strategy could be significant since this sector accounts for 85 percent of global water consumption, which is the leading current threat to freshwater biodiversity. Such approaches could be proactive, i.e., initiated in advance of any manifestations of CC impacts, and could include institutional approaches such as developing property rights for water or water pricing (Goklany 2002, 2005)." (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted. Will consider
18-493	A	23	35			Add a new para here as follows: "Hunger, Biodiversity and Carbon Sequestration. Among the barriers to sustainable development that could be exacerbated by climate change are pressures on biodiversity, hunger and malnutrition. Noting that there is a common thread running through these apparently disparate problems – the demand for food leads to land clearance which is today the major threat to terrestrial biodiversity and reduces carbon stocks and sinks – Goklany (1998, 2000, 2005b) identifies approaches that would simultaneously make progress on all three fronts by increasing the efficiency of the food and agricultural sector (in terms of usable food produced per hectare of cropland) with lower inputs of fertilizers and pesticides. This strategy is based on the following logic: First, greater food productivity per unit of land would increase food production which would help limit hunger and malnutrition. That would have positive knock-on effects on public health, and through that, other aspects of human well-being (e.g., economic growth and increasing human capital), which would also advance response capacities. These effects would be magnified for developing countries whose employment and economic well-being are much more dependent on agriculture. Second, greater food productivity would reduce the amount of land otherwise devoted to agriculture, which, in turn, would lower loss and fragmentation of habitat and threats to biodiversity, as well as conserve carbon stores and sinks. Among other CC and non-CC related benefits of these approaches would be lower soil	Will consider

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						erosion and, possibly, a reduction in fertilizer usage. Lowering the demand for cropland would also reduce land prices and, with that, the socio-economic costs of acquiring or reserving land for carbon sequestration and/or habitat conservation (Goklany 1998). (Indur Goklany, Office of Policy Analysis, Department of the Interior)	
18-494	A	24	1			Figure 18.4 needs considerable work. Why is geo-engineering an operational policy? I always thought it was a technique. Same issue with ecological feedbacks. Why are these operational policies? (Susan Cutter, University of South Carolina)	Noted. Will clarify
18-495	A	24	1	24	25	I do not find this Fig much help. Some parts are distinctly puzzling. E.g. "insurance" is equally adaptive and mitigative and only at the strategy to policy level. How is insurance mitigative at a strategic level? What about the various suggestions that insurance should provide adaptive opportunities at the operational level. If the ellipse should be read to span across these areas as well, then what am I supposed to read from the figure. An interesting exercise I am sure, but what do we do with it? (Ian Noble, The World Bank)	Noted. Will clarify
18-496	A	24	1	24	25	Grammar inside ellipses need attention - how are "ecological feedbacks" or "local energy use" actions? (Rachel Warren, School of Environmental Sciences)	Noted. Will clarify
18-497	A	24	22			Figure 18.4 -- I find the figure difficult to interpret. What does it mean to place "health benefits of mitigation" at the operational end of the adaptation scale and at the strategic end of the mitigation scale? Why does trade liberalization represent a policy level action for adaptation but a strategic action for mitigation? The figure needs to be explained better or deleted. (Neil Leary, International START Secretariat)	Noted. Will clarify
18-498	A	24	22	24	22	Figure 18.5? (Youba SOKONA, Sahel and Sahara Observatory (OSS))	Noted. Will correct
18-499	A	24	22			Figure 18.4 …My God! another totally useless figure. I actually studied it for 5 minutes and gave up trying to get any message. Perhaps if there were just 4-6 carefully selected bubbles you could make more insightful comments. No reference given for this figure. (Dennis Tirpak, OECD)	
18-500	A	24	24	2	2	Need to define "MEA" used in figure 18.4 (actually 18.5) (Katharine Hayhoe, Texas Tech University)	Noted. Will clarify

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
18-501	A	24				Figure 18.4 - interesting, but I would argue that some of the circles are misplaced. Whoever designed it - pls. rethink the placement of "insurance", "awareness of impacts and motivation for action" and "impacts liability & mitigation targets" (Susanne Moser, National Center for Atmospheric Research)	Noted. Will clarify
18-502	A	24				Fig. 18.4 contains enormous amount of information, put together from many studies. For which I commend the group. For example, it shows that air conditioning is an adaptive response, which increases GHG emissions and should be mitigated! This category of trade-offs should be highlighted with more discussion. I am also disappointed to see so many schematic diagrams - some from SAR days and some that convey very little. For example, Act – learn diagrams do not add anything new and apply to any situation – not just climate change. I hope, some quantitative information is also available to replace some of the schematic diagrams. A three page long box on GEF that looks like a download from GEF website, seems unwarranted, especially when GEF contribution is not even a drop in the bucket and does little for adaptation. Instead, please give us a treat with some analysis or even summaries (boxes) etc. from some interesting references. State-of-the-art review with some quantitative and conceptual analysis is badly needed - which is what I had hoped for!! Such a qualitative and quantitative analysis with correct paradigms is well within the competence of the group. (Jyoti Parikh, Integrated Research and Action for Development)	Noted. Will clarify
18-503	A	25	0	26		I recommend modifying the table in light of the above comments. (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted. Will clarify
18-504	A	25	0			Table 18.1: totally inadequate listing of linkages; in many cases unrelated, or at best very indirectly related, to the subject of the chapter. All kinds of relations between either adaption or mitigation with economic development, but hrdly ever on linking mitigation with adaptation (Tom Kram, MNP-RIVM)	Noted. Will clarify
18-505	A	25	0			Table 18.1 -- the intended purpose of the table seems to be to present examples of mitigation and adaptation that have links to the other. But the entries in the table often do not make explicit the relationships between mitigation and adaptation.The table needs some work to highlight what the linkages are. (Neil Leary, International START Secretariat)	Noted. Will clarify
18-506	A	25	0	26	0	Table 18.1 Looks promising but the clusters are not yet fully explained- the analysis could usefully be developed. (Merylyn McKenzie Hedger, Environment Agency)	Noted. Will clarify

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
18-507	A	25	0			In table 18.1 The rural electrification from fossil fuel based option will not certainly reduce GHG emissions, therefore you need to specify rural electrification by renewables. What is v.v.? (Youba SOKONA, Sahel and Sahara Observatory (OSS))	Noted. Will clarify
18-508	A	25	0	26		This table holds great promise. However, it is hard to understand what points you are trying to make. In some columns there are terms like 'GEF small grants or Finnish technology programme' which have no immediate meaning to most readers and they are not obviously connected to ' community water, land-use, forestry and energy'. Therefore one problems is the horizontal connections. A second problem is that the 'types of linkages' (column 1) are apples and oranges. Perhaps grouping them under some sub-headings such as policies, programmes, activities, etc. might help to bring some order to the table...Perhaps some items could be dropped because they really don't fit. It needs work, but given the effort that has already gone into it..it is worth a try. (Dennis Tirpak, OECD)	Noted. Will clarify
18-509	A	25	1			6. Table 18.1 could more usefully identify the balance of positive vs negative interactions between mitigation and adaptation in the studies listed (Diana Liverman, Oxford University)	Noted. Will clarify
18-510	A	25	1			Table 18.1: as it stands, the table is not very informative, particularly the column "examples" which presents a mixture of commodities, abstractions and donor programmes. More generally it is not always clear why the examples concern both adaptation and mitigation, or whether they represent synergies, trade-offs, or potentially both according to circumstances. Essentially, the authors are attemting to present too much information in table form. If space can be created by elimination of repetition or over-abstract conceptualisation elsewhere, a number of these examples could be discussed at greater length in the main text or in boxes. (John Morton, Natural Resources Institute, University of Greenwich)	Noted. Will clarify
18-511	A	25	1	26		Again. I am puzzled as to what I am supposed to gain from this table. Take the first line. It is stating the obvious that switching to renewables or energy efficiencies can and usually leads to reduced GHG emissions. But what are you saying about adaptation. This table is supposed to show the inter-relationships. Most of the other entries are just as trivial or just as much non-sequiturs. This table probably represents what should be the core material of this chapter but there has obviously been very little analysis, assesment or intellectual engagement so far. At this stage the table represents little more than a literature list that the authors should be assessing. (Ian Noble, The World Bank)	Noted. Will clarify

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
18-512	A	25	1	26		The table title is on links between mitigation and adaptation, this is not evident from the table contents, I propose to add columns describing adaptation and mitigation aspects of the options presented, respectively (Rob Swart, MNP)	Noted. Will clarify
18-513	A	25	25	2	2	"Local energy use" - a non-synergistic example that could be referred to (either here or in another location in this chapter where potential conflicts between adaptation and mitigation measures are discussed) is that of fuel-switching (also mentioned on p. 29). As shown in Hayhoe et al., "Substitution of natural gas for coal: climatic effects of utility sector emissions" (Climatic Change, 2002), even a seemingly straightfoward switch from a higher to lower carbon-containing fuel such as gas whose burn efficiencies are generally much higher than coal can under certain conditions result in an increase in warming over certain timeframes and depends strongly on key factors such as the initial controls on particulate matter (before the switch), the difference in efficiency between the technologies used, the characteristics of the individual fuels (which vary greatly by region), and the amount of natural gas lost in transport and processing prior to combustion. (Katharine Hayhoe, Texas Tech University)	Noted. Will clarify
18-514	A	25				Table 18.1 in the Description column, three entries down - what is "v.v"? (Susanne Moser, National Center for Atmospheric Research)	Noted. Will clarify
18-515	A	26	0			Table 18.1. The use of timber for construction purposes (instead of concete) could be an example of a link between mitigation and adaptation (Especially type of linkage: "Urban planning. Building Design and recycling"). Enhanced use of forest resources could enable faster adaptation to future climate conditions in the forestry sector. (Martin Welp, Potsdam Institute for Climate Impact Research)	Noted. Will clarify
18-516	A	26	0			Table 18.1. The last item "UNFCCC negotiations and funds": Global cap and trade schemes, which include an equal per capita distrubutions of emission rights and trading with rights have been suggested by various authors. This would lead to considable transfer of financial resources to the South, and thus have great relevance for both mitigation and adaptation (for example for India, China, etc. other growing emitters). Such a global-cap- and trade scheme has been proposed for example by Lutz Wicke in a recent book "Beyond Kyoto- A new Global Climate Certificate System" (2005, Springer). (Martin Welp, Potsdam Institute for Climate Impact Research)	Noted. Will clarify
18-517	A	26	26	2	2	Table 18.1 - under the section "awareness of impacts and motivation for action" there are further important examples that should be included. A U.S. example is discussed in Hayhoe et al. "Regional Assessment of Climate Impacts on California under	Noted. Will clarify

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						Alternative Emission Scenarios – Key Findings and Implications for Stabilisation" in press as part of the proceedings of the UK DEFRA symposium on dangerous anthropogenic climate change (T. Wigley, ed.). Pre-print is attached. Section 3 of this publication describes how climate change impacts studies for the state, including one whose main conclusions were the differential impacts on California that would result from a higher vs. a lower emission scenario, were cited in a June 2005 Executive Order for California (www.dot.ca.gov/hq/energy/ExecOrderS-3-05.htm) as the rationale for mandatory greenhouse gas emission targets for the state. Similar statements in regards to impacts and motivation for action have been made previously by the U.K. and the E.U. in support of their own GHG emission or concentration targets, and should also be referred to here. (Katharine Hayhoe, Texas Tech University)	
18-518	A	26	26			"Ecological Feedbacks" - missing references (Katharine Hayhoe, Texas Tech University)	Noted. Will add
18-519	A	27	0			This section needs a major overhaul! Consider the current structure.It has 3 paras on the mitigation relating to the convention (including one reference to a partnership that has only issued a press release and no others and an incorrect description of the CDM), 3 paras on adaptation, 2 on mainstreaming, 1 para on institutions, and 3 paras (largely prescriptive) on African institutions only! One way for you to start would be to consider international, national and regional/local policies. In that framework you could look at different types of policies (market, fiscal, regulatory, public information, R&D, voluntary agreements, etc.) There is a large source of material in the NCs from UNFCCC Parties that could be mined. To save space you should also cross reference WGIII Chapter 18. S. Agrawala of OECD can provide you with a number of references on mainstreaming that would be helpful. When it comes to institutions; an international, national and local framework would also help. The institutional section needs a broad overview that describes the types of institutions and their roles. You may wish to provide a list of at least the key international ones. In redrafting, please avoid opinions such as on page 29 lines 23-26 and 28-31 and prescriptions ..lines 42-45...page 30 lines 12-13 and opinionated lines 22-28. Please start over with a clean sheet of paper! This section will create a lot of angst if not done properly. (Dennis Tirpak, OECD)	Noted. Will clarify
18-520	A	27	1			section 18.4.2 on climate policy. This discussion seems very centralised. How about a discussion of capacity building at local/regional levels from the adaptation literature? (Jonathan Köhler, University of Cambridge)	Noted. Will clarify
18-521	A	27	1	30	42	Many excellent points are made in this section regarding adaptation and mitigation	Noted. Will clarify

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						policies and institutional arrangements for their implementation. Particularly good are points made about links between adaptation and development policies and mainstreaming adaptation. But most of the section treats adaptation and mitigation policy separately, and only occaisionally does the section directly address their connections. Chapter 18 is not the place for lengthy discussion of adaptation or mitigation policy in isolation from the other. Section 18.4.2 should be shortened and focused very specifically on the connections, or potential connections, for implementing adaptation and mitigation policies. If adaptation and mitigation should both be part of the development agenda, what does that mean for how they are implemented and how institutional responsibilities should be assigned? The paragraph that starts at the end of page 28 is an example of the types of issues that I think should be the focus of the section. Expand on those types of issues and cut the text that treats adapation and mitigation individually (taking steps to assure that the points deleted from chapter 18 get taken up by chapter 17 of WG2 report and whatever is the appropriate WG3 chapter). (Neil Leary, International START Secretariat)	
18-522	A	27	1	27	41	Much of this material, which is a good introduction to the issues, could be shifted forward. (John Morton, Natural Resources Institute, University of Greenwich)	Noted. Will consider
18-523	A	27	1	30	42	In several places Sect 18.4.2 comes very close to (or becomes) policy prescriptive. It should be checked carefully and rephrased. Examples Page 27 line 46; page 29 line 13; page 30 line and line 41. Most of these points can still be made, but more carefully. (Ian Noble, The World Bank)	Noted. Will clarify
18-524	A	27	1			Section 18.4.2 This isn't a helpful comment, but I found this section quite discursive. Is it a review of recent policy developments or a review of scientific literature? (Jim Skea, UK Energy Research Centre)	Noted. Will clarify
18-525	A	27	1	27	1	I am not sure if the title of this section should include institutions as I have not seen development of institutions (Youba SOKONA, Sahel and Sahara Observatory (OSS))	Noted. Will clarify
18-526	A	27	1	31	4	These sections are mostly not about the adaptation-mitigation links, I proposde to move this to Chapter 20 (Rob Swart, MNP)	Noted. Will clarify
18-527	A	27	1		41	lack of references (Shaohong WU, Institute of Geographical Sciences and Natural Resource Research, CAS)	Noted. Will add

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
18-528	A	27	12	27	32	Delete this section, not so erelevant here, the text around this could be moved to the introduction of the chapetr, linking the mitigation/adaptation linkages to Article 2 (Rob Swart, MNP)	Noted. Will clarify
18-529	A	27	24	27	32	18.4 Inter-relationships between adaptation and mitigation: 2) For sustainable development of the communities, renewable energy development is most practical option to each region and country. (Mitsuru ANDO, Toyama University of International Studies)	Noted. Will clarify
18-530	A	27	24	27	32	The statement "the CDM has spawned a large number of projects…" is not consistent with the actual situation as I understand it. The authors should present details on how much actual abatement has been achieved relative to the total if they want to make blanket statements like this. The size of abatement acheived is the critical issue. (Warwick McKibbin, RSPAS, ANU)	Noted. Will clarify
18-531	A	27	27			refs missing (Susan Cutter, University of South Carolina)	Noted. Will add
18-532	A	27	27	27	30	Number of registered CDM projects as of October 26 is only 26, that invites lots of criticisms toward the Executive Board. Therefore it has not spawned a large number of projects. (Mitsutsune Yamaguchi, Teikyo University)	Noted. Will clarify
18-533	A	27	41			Add references (Goklany 2000, 2005). (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted. Will add
18-534	A	27	43			This paragraph is very confusing. Can it be simplified? (Susan Cutter, University of South Carolina)	Noted. Will clarify
18-535	A	27	44			Sperling is not in refs. (Susan Cutter, University of South Carolina)	Noted. Will add
18-536	A	27	45	27	47	This seems like a political statement. It might be better just to give the text and let the readers make up their own minds (Chris Hope, Judge Business School)	Noted. Will clarify
18-537	A	28	21			The following references (or a subset thereof) would be relevant on lines 21, 34, 44: Goklany (1995, 1999a, 2000) (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted. Will consider
18-538	A	28	23		24	Should make a cross-reference to that discussion on mainstreaming in Chapter 17. (Susanne Moser, National Center for Atmospheric Research)	Noted. Will clarify
18-539	A	28	37			I could not find Sperling, 2003 in the list of references at the end of the chapter. Perhaps the citation is to AfDB et al, 2003, "Poverty and climate change" that is listed in the references? I think Sperling was the main author of that report, although the	Noted. Will add

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						AfDB report does not list its authors. (Neil Leary, International START Secretariat)	
18-540	A	28	37	28	38	Here the question arises if mainstreaming of climate concerns into development policies is in fact climate policy; I propose that it is not, it is complementary to climate policy, although part of the climate policy can be to encourage mainstreaming, not to implement it. Or as in line 47: to facilitate it. (Rob Swart, MNP)	Noted. Will clarify
18-541	A	28	41			Although Klein may list addressing development and equity issues as a role of climate policy, this can be quetioned (most developed countries would probably disagree). (Rob Swart, MNP)	Noted. Will clarify
18-542	A	28	44		44	At the end here, you may add that the impacts of climate change will likely magnify previously existing inequities. (Susanne Moser, National Center for Atmospheric Research)	Noted. Will clarify
18-543	A	28	48		50	Add: also needs mechanisms to facilitate increased awareness, understanding, and institutional change among decision-makers and managers to support mainstreaming. Research suggests that those who will take adaptation measures currently don't see why or how they should do anything like it. (Susanne Moser, National Center for Atmospheric Research)	Noted. Will consider
18-544	A	29	0			7. p29 does not clearly justify why Africa is highlighted. There are similar issues in other regions and the discussion does not refer to a published literature (Diana Liverman, Oxford University)	Noted. Will clarify
18-545	A	29	2			There is yet another role, namely, ensure that climate policy does not prolong existing problems. See: [1} Tol, RSJ. 2005. Of Dangerous Climate Change and Dangerous Emission Reduction. Symposium on Avoiding Dangerous Climate Change, Exeter, Febrauary 1-3, 2005. [2] Goklany (2001). Accordingly, I would commence the new sentence beginning on line 2 as follows: "With THESE new ROLES,..." (Indur Goklany, Office of Policy Analysis, Department of the Interior)	Noted. Will consider
18-546	A	29	23	29	26	This is a very shallow treatment of a major issue and not just in Africa. (Ian Noble, The World Bank)	Noted. Will clarify
18-547	A	29	29	29	30	I am not sure if this is the official English version of the full name of CILSS: Permanent Interstate Committee to Combat Drought in the Sahel seems more accurate (John Morton, Natural Resources Institute, University of Greenwich)	Noted. Will clarify
18-548	A	29	42	29	50	I believe the list of UEMOA countries should include Mali. The point could be made that regional organisations have overlapping mandates, e.g UEMOA may have an energy mandate but CILSS, with a smaller membership, has the mandate on drought	Noted. Will clarify

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						and desertification, and that they may not cover all the countries with a given environmnetal concern , e.g. neither includes Chad, nor any of the anglophone countries of West Africa (John Morton, Natural Resources Institute, University of Greenwich)	
18-549	A	29	45	29	46	Please add Guinea Bissau and Mali on the list of the member countries of UEMOA (Youba SOKONA, Sahel and Sahara Observatory (OSS))	Noted. Will clarify
18-550	A	29	47	29	48	Please explain how this suggestion fits with the earlier discussion that reforestation/land use mitigation actions are so often negative to development issues (Ian Noble, The World Bank)	Noted. Will clarify
18-551	A	30	1	30	42	This information is so important can it be reflected in the Executive summary? (Rachel Warren, School of Environmental Sciences)	Noted. Will clarify
18-552	A	30	6	30	10	This limitation of resources and staffing and the resulting limited grasp of complexities is not a singular failing of developing countries and they should not bear this cross alone. Other countries, who have not accepted the concerns of climate change implications for reasons other than development status, often make a conscious effort to exclude climate change from seemingly related discussions. (Suzanne Bolton, National Marine Fisheries Service/NOAA (ST7))	Noted. Will clarify
18-553	A	30	12	30	42	Could be added that the Bonn Conference on Renewable Energies (2004) reccomends that WTO should arrive to an agreement to eliminate subsidies to non renewable energies. This and other issues related to climate change and WTO can be find at HWWA working paper Liberalisation of environmental goods and services and climate change. Text of working paper is attached separately. (Patricia Iturregui, Consejo Nacional del Ambiente)	Noted. Will clarify
18-554	A	30	12			The EU did already start integrating climate concerns into various policies (like floods, marine strategy, biodiversity strategy, etc.), but it is still to be implemented and can be further encouraged) (Rob Swart, MNP)	Noted. Will clarify
18-555	A	30	13			Material here is repeated in Ch.18, Box 18.4, but with better information on three of the four funds under GEF. Authors of both chapters should take care to minimise duplication. (John Morton, Natural Resources Institute, University of Greenwich)	Noted. Will clarify
18-556	A	30	19	30	19	Developing nation energy demands may be relatively small at present, but where is the discussion of the developing world's burgeoning energy requirements and the impact of this on mitigation goals? (Ian Noble, The World Bank)	Noted. Will clarify

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
18-557	A	30	21	30	22	Is it correct that the trend is to human and animal power - even if this is meant only to apply to Africa. Is this in terms of some absolute measure or relative. It is quite a stunning statistic and should be considered further. Is this trend (if correct) likely to continue very much into the future? What are the implications regarding adaptation if mechanised agricultural inputs are declining? (Ian Noble, The World Bank)	Noted. Will clarify
18-558	A	30	25	30	28	Sweeping statements about the WTO as here are of little help. Analyse what has been said or not said and what the implications are. (Ian Noble, The World Bank)	
18-559	A	30	28			It is important to notice how 'globalisation' affects the transformation of social convention and demand, as well as the capacity or otherwise to adapt and respond. (Elizabeth shove, Lancaster University)	Noted. Will clarify
18-560	A	30	41		41	This sentence is a good example of the borderline advocacy'ish tone of this chapter. You could drop "need to be encouraged as they have the ability to" and still get most of the sense here across, without making yourself vulnerable to attack. (Susanne Moser, National Center for Atmospheric Research)	Noted. Will clarify
18-561	A	30	41			needs to be encouraged: policy-prescriptive (Rob Swart, MNP)	Noted. Will clarify
18-562	A	30	45	33	14	This important section on effective implementation is, as yet, largely unwritten. A few issues that the authors should think about when they do write the section: (1) disabuse people of the notion that every adaptation project should include mitigation elements and that every mitigation project should include adaptation. Such an approach is sure to result in gross inefficiencies. The message should be, look for synergies, act on them where they exist and make sense, but don't discriminate against measures that would advance only one or the other. (2) Look at current institutional arrangements to see if there are existing examples where energy policy and programs, natural hazards management (including climate hazards), sectoral policies and programs (e.g. agriculture, water sector, public health), and development policies and programs come together and are implemented jointly or coordinated in some fashion so as to work synergistically (or at least not work at cross purposes). If examples can be identified, how well have they worked? How did they come to be done? Do they provide a possible model for coordinating climate change mitigation and adaptation? If such examples do not exist, why not? Should they? How? (3) Financing: put the GEF financing into context with other financing. What is total ODA? What do governments spend on domestic investments in infrastructure, energy, economic development, land and other resource managment, natural hazards management, met services, etc? Point	Noted. Will be revised

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						to get across is that GEF financing is exceedingly small compared to the total picture. Most mitigation and adaptation will be paid for by other means. GEF funding can serve as a catalyst, supporting innovative ideas and pilots, but it will never have the resources to do much more. This is the point of mainstreaming - climate policy will need to be taken on-board by the institutions that have the resources to do something about the problem. If they are unconvinced that mitigation and adaptation are important to their own missions and goals, we won't get very far. (Neil Leary, International START Secretariat)	
18-563	A	30	45	33	11	This summarises my main problem with the current state of this chapter - implementation is missing. The Box on GEF is accurate, but should be shortened. The core point is that GEF like so many others has initially focused on mitigation but is now looking at adaptation in more detail. This hardly requires 2 1/2 pages. Also how much of this will be relevant by the time the AR4 is published? The question that needs to be asked what can GEF say about the interrelationships between adaptation and mitigation based on its experience with so many projects. Should systems be put in place so that this experience is used more effectively? The authors' do comment on this point (not just in relation to GEF) later, but here is an opportunity to do some value added assessment. (Ian Noble, The World Bank)	Noted. Will be revised
18-564	A	30	45			Section 18.5 Same comment as above. (Jim Skea, UK Energy Research Centre)	Noted
18-565	A	30	45	33	14	Section 18.5 need to be completed and sepcified. The box and table are only example. (Shaohong WU, Institute of Geographical Sciences and Natural Resource Research, CAS)	Noted. Will clarify
18-566	A	30	47			Section 18.5: clearly the main text still needs writing (John Morton, Natural Resources Institute, University of Greenwich)	Noted. Will clarify
18-567	A	31	4		4	At the end here, cite this forthcoming (in press) paper: 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. Will clarify
18-568	A	31	7			18.5.1 text needs to be finished (Susan Cutter, University of South Carolina)	Noted. Will clarify
18-569	A	31	7			Sections 18.5.1 - 18.5.3. Obviously need filled out. Why the big GEF box? (Jim Skea, UK Energy Research Centre)	Noted. Will rewrite

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
18-570	A	31	7			Is the text missing? (Dennis Tirpak, OECD)	Noted. Will clarify
18-571	A	31	8	31	8	The text of this sub-section is missing (Youba SOKONA, Sahel and Sahara Observatory (OSS))	Noted. Will clarify
18-572	A	31	10	31	10	More could be said on ways to finance adaptation and disaster risk management, and risk transfer via insurance, as UNFCCC and GEF funds are small compared to government spending on disaster risk reduction and large infrastructural projects. See also sections in Chapter 7, and papers such as Bouwer, L.M., Aerts, J.C.J.H. (in press). Financing climate change adaptation. Disasters 30(1); Bouwer, L.M., Vellinga, P. (2005). Some rationales for risk sharing and financing adaptation. Water Science and Technology 51(5), 89-95. http://www.iwaponline.com/wst/05105/wst051050089.htm; Hoff, H., Warner, K., Bouwer, L.M. (2005). The role of financial services in climate adaptation in developing countries. Vierteljahrshefte zur Wirtschaftsforschung 74(2), 196-207; Freeman, P.K., Warner, K. (2001). Vulnerability of infrastructure to climate variability: how does this affect infrastructure lending policies? Provention Consortium, Geneva. http://www.proventionconsortium.org/files/vulnerabilityofinfrastructure.pdf (Laurens Bouwer, Institute for Environmental Studies, Vrije Universiteit)	Noted. Will be revised
18-573	A	31	10			18.5.2 text needs to be finished (Susan Cutter, University of South Carolina)	Noted. Will clarify
18-574	A	31	11	31	11	need perhaps a paragraph before the box. Here again the title of this sub-section is financing and institutions but there is no elements on institutions (Youba SOKONA, Sahel and Sahara Observatory (OSS))	Noted. Will clarify
18-575	A	31	13			Box 18.4 should be part of the main text, with table 18.2 as a box (Susan Cutter, University of South Carolina)	Noted. Will be revised
18-576	A	31	14			box 18.4 This description of the GEF needs a discussion in terms of the connection between adaptation and mitigation (Jonathan Köhler, University of Cambridge)	Noted. Will be revised
18-577	A	31	14			Box 18.4: This repeats material in Ch.17, page 30 et seq., but does contain better information on three of the four funds under GEF. Authors of both chapters should take care to minimise duplication. (John Morton, Natural Resources Institute, University of Greenwich)	Noted. Will be revised
18-578	A	31	14			Box 14.4 The GEF is a 'mechanism' under the UNFCCC not a fund. I suggest that you send this informally to the GEF to ensure its accuracy. While the box is OK, there is no description of other institutions, bilateral programmes and other financial	Noted. Will be revised

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						arrangements such as public/private partnerships. Also, the title of section 18.5.2 says Financing and instituions...do you mean Financial Institutions..if the former, what is the relationship to section 14.4.2 (Dennis Tirpak, OECD)	
18-579	A	31	31	2	4	This is an important point that could be expanded upon further - there is indeed a vast difference between nations of similar socioeconomic stature but different culture. Socialized vs. individualistic societies display enormously different attitudes towards social welfare, risk, and responsibility to mitigate or adapt to that risk on the behalf of others. (Katharine Hayhoe, Texas Tech University)	Noted. Will be revised
18-580	A	31	32	13	40	This discussion is very interesting, but in the interests of conserving space perhaps it could be condensed by about 50% and some references added instead. (Katharine Hayhoe, Texas Tech University)	Noted. Will clarify
18-581	A	31	40	31	40	Eberhard and Tokle, 2004 could not be found in the reference section. (Mitsutsune Yamaguchi, Teikyo University)	Noted. Will add
18-582	A	31	49	31	49	"bus-rapt transit" is there another term? This one has no meaning to me. (Suzanne Bolton, National Marine Fisheries Service/NOAA (ST7))	Noted. Will clarify
18-583	A	32	33		33	you may also want to add coastal to what's in the parentheses (Susanne Moser, National Center for Atmospheric Research)	Noted. Will clarify
18-584	A	32	39	32	39	Figure 18.6? And alsoreference Eberhard and Tokle is not in the bibliography (Youba SOKONA, Sahel and Sahara Observatory (OSS))	Noted. Will clarify
18-585	A	32				Some portions of this textbox are partial repeats of text already written previously in this chapter. (Susanne Moser, National Center for Atmospheric Research)	Noted. Will clarify
18-586	A	33	14			18.5.3 needs to be finished (Susan Cutter, University of South Carolina)	Noted. Will clarify
18-587	A	33	15	33	16	the development of Relevance to policy and development is missing (Youba SOKONA, Sahel and Sahara Observatory (OSS))	Noted. Will clarify
18-588	A	33	17			section 18.6 A clear, comprehensive and properly constructed analytical framework for analysing the links between adaptation and mitigation appears to be lacking. This should also be the subject of further research. (Jonathan Köhler, University of Cambridge)	Noted. Will clarify
18-589	A	33	17	35	18	The information needs described in this section seem an odd jumble and not very compeling. It seems more like initial thoughts of one or two authors and not like the result of a systematic assessment of information needs that all the chapter's authors	Noted. Will clarify

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						agree are priorities. It might help to first identify a small number of questions about relationships between mitigation and adaptation for which the authors believe it is important for policy-makers to have answers to make better decisions about climate policy. Then identify information needs for answering those questions, and the types of research, assessment and synthesis that would help to provide that information. (Neil Leary, International START Secretariat)	
18-590	A	33	17	34	35	In reviewing this section you may wish to consider what is needed, who needs it and when. Presently it is a mixture of comments and suggestions with no particular audience in mind. I found lines 34-48 a rather narrow and strange set of examples....it appears to reflect someones pet interest. Missing from the discusison is any mention of how to improve data to assess response capacity, new tools to assess tradeoffs of different types, information on synergies relating to policies and technologies, analyses of instituions and who makes decisions...in other words 'information needs' that flow directly our of the key sections of your chapter. (Dennis Tirpak, OECD)	Noted. Will clarify
18-591	A	33	18	35		Not all recommendations are about the adaptation-mitigation nexus (some are about adaptation only): scrutinize the section and delete issues not speaking to the subject of the chapter, focus on synergies and trade-offs at the level of concrete options. (Rob Swart, MNP)	Noted. Will clarify
18-592	A	33	19	33	21	Not a sentence (Chris Hope, Judge Business School)	Noted. Will clarify
18-593	A	33	19	35	18	The text here is not the development of information needs. I have difficulties of understanding what is the focus of this sub-section. (Youba SOKONA, Sahel and Sahara Observatory (OSS))	Noted. Will clarify
18-594	A	33	19	33	21	I do not understand this phrase (Youba SOKONA, Sahel and Sahara Observatory (OSS))	Noted. Will clarify
18-595	A	33	33	2	3	It would be helpful and informative, without adding to the size of the chapter, to add a 6th column citing a few specific examples of the types of activities being funded in each of these nations. (Katharine Hayhoe, Texas Tech University)	Noted. Will clarify
18-596	A	33	35	17	18	This is a useful section but needs more organization, content and structure. For example, the discussion on gender inequity is fascinating, but if it is to be included it needs to be expanded and references provided. There may be too much information in this section to do a good job with everything in the space provided. (Katharine Hayhoe, Texas Tech University)	Noted. Will clarify

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
18-597	A	34	6		9	The recent Mastrandrea/Schneider paper (2004 or 05) could also inform this paragraph. (Susanne Moser, National Center for Atmospheric Research)	Noted. Will clarify
18-598	A	34	12			a-m "links are substantial and urgent" - what is meant by this sentence? (Ian Noble, The World Bank)	Noted. Will clarify
18-599	A	34	13	34	16	"Many analysts …" These two sentences represent a core conclusion of the synthesis and will (if it eventually appears in AR4) have considerable impact as it calls into question the search for synergies, win-win etc that some Parties are now seeking as the rationale for their adaptation actions. However, it is presented without substantiation. We just have "Many analysts suggest ...". (Ian Noble, The World Bank)	Noted. Will clarify
18-600	A	34	18	34	23	A global optimum, defined in terms of economic efficiency, is a chimera. A global optimum is a unique and operational concept only if all the Earth's inhabitants, present and future, can agree on a method of measuring the well-being of individuals and a set of mathematical weights for adding up the well-being of individuals so that we may judge, in full consensus, which actions that benefit some but harm others are to be accepted as improving the welfare of human kind. No amount of research or "concerted effort" will achieve this. The notion of a global optimum is a heuristic device, useful for understanding some of the implications of choices and the trade-offs that would follow from different choices, but it is not useful as an operational decision rule to identify a policy that is "best." Choosing a "justifiable" mix of mitigation, adaptation and development policies will come from consultative and decision processes that are widely perceived as legitimate even if flawed; it will not come from globally aggregated estimates of benefits and costs. Research that will help us to design processes that are likely to gain greater acceptance as legitimate are needed more than research to identify an elusive global optimum. The section should give attention to information needs and research needs to improve the performance of institutions for facilitating climate policy decisions that are effective for achieving desired ends and that are viewed as legitimate. (Neil Leary, International START Secretariat)	
18-601	A	34	18	34	23	The first conclusion of the chapter is that on a global scale, climate policy is not about choosing between mitigation or adaptation. Would it not be a waste of research money to try to find an optimal mix? I propose to drop this paragraph. (Rob Swart, MNP)	Noted. Will clarify
18-602	A	34	22	34	23	There are now many studies of the social cost of carbon, so it is not clear what this sentence means.	Noted. Will clarify

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Chris Hope, Judge Business School)	
18-603	A	34	25	34	26	Please give examples of mitigation leading to perverse subsidies (Ian Noble, The World Bank)	Noted. Will clarify
18-604	A	34	27	34	29	What does this sentence mean - that it is difficult to create the links between policy and private action; or that the necessity is a problem? (Ian Noble, The World Bank)	Noted. Will clarify
18-605	A	34	31			8. Discussion at bottom of p34 could be more explicit about balance of mitigation and adaptation and provide some references. For example, in mitigation through forestry tree selection should take into account possible climate changes (Diana Liverman, Oxford University)	Noted. Will clarify
18-606	A	34	33	34	49	This example from agroforestry could be better placed in a separate box. (Martin Welp, Potsdam Institute for Climate Impact Research)	Noted. Will clarify
18-607	A	34	34	34	39	This dot point is somewhat at odds with the earlier statements about reforestation and water. What does sustain the hydrologic function of the soil" really mean? (Ian Noble, The World Bank)	Noted. Will clarify
18-608	A	34	41			Is the problem higher up-front investments or that the returns come later? (Ian Noble, The World Bank)	Noted. Will clarify
18-609	A	34	48			"should be high" - please provide an assessment (Ian Noble, The World Bank)	Noted. Will clarify
18-610	A	34	50		50	Can you add some empirical evidence for this, examples? (Susanne Moser, National Center for Atmospheric Research)	Noted. Will clarify
18-611	A	35	0			I spent 4 nights working on this. I have high expectations for the next draft! (Dennis Tirpak, OECD)	Noted. Will clarify
18-612	A	35	8	35	18	The last paragraph seems to come out of the blue and is not derived from the material presented in the chapter, especially the last sentence. (Susan Cutter, University of South Carolina)	Noted. Will clarify
18-613	A	35	11		13	In a recent issue of Tiempo, the gender aspect of mitigation/adaptation/impacts was highlighted with references to published studies. Seems like you should look those up and add a bit material here. (Susanne Moser, National Center for Atmospheric Research)	Will do.
18-614	A	35	12	35	12	"Cross-gender" is unnecessary (John Morton, Natural Resources Institute, University of Greenwich)	Diasgree - not if it means that certain groups or communities are already starting from a much heightened vulnerability
18-615	A	35	14	35	15	These statements about women's roles are simplistic: men clearly have massive responsibilities for water management, probably in most irrigated, certainly in most	This is debatable. But the statement will be contextualised and references provided to

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						large-scale irrigated systems. Women may provide more agricultural labour globally, but not to the extent suggested, outside Africa. (John Morton, Natural Resources Institute, University of Greenwich)	substantiate this assertion
18-616	A	35	16			"provide the active labour force" - I suggest "a large portion of the labour force" (Ian Noble, The World Bank)	Will be modified
18-617	A	36	3	42	43	Reference: For Peak Oil Scenario: 1) Campbell, C. J., 2002: Forecasting global oil supply 2000-2050. Hubbert Center Newsletter 2002/3. M. King Hubbert Center, Colorado School of Mines, Colorado, USA. For Mitigation Options to Prevent Health Impacts by Global Warming: 2) Ando, M., 1998: Risk assessment of global warming on human health. Global Environment Research, 2(1), 69-78, Association of International Research Initiatives for Environmental Studies (http://www.airies.or.jp/publication/ger/pdf/02-1-10.pdf). (Mitsuru ANDO, Toyama University of International Studies)	Noted
18-618	A	42	12	42	14	Please replace this reference by Tol, R.S.J., Verheyen, R. (2003). State responsibility and compensation for climate change damages-a legal and economic assessment. Energy Policy 32(9), 1109-1130. http://dx.doi.org/10.1016/S0301-4215(03)00075-2 (Laurens Bouwer, Institute for Environmental Studies, Vrije Universiteit)	Noted