



**IPCC WGII
Fourth Assessment Report
Climate Change Impacts, Adaptation and Vulnerability**
Expert Review of First Order Draft

Specific Comments

Chapter 16

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**.

IPCC WGII AR4 FOD Expert Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
16-0	A	0				<p>Co-chair and TSU comments</p> <p>Length: This chapter is underlength. The authors could usefully use this space by addressing impacts and vulnerabilities of high-latitude small islands.</p> <p>There is really no recognition in this chapter that it should move beyond Small Island States to look at all Small Islands. It may well be that, for small islands in high latitudes, there are benefits associated with climate change, especially in the early years. The chapter talks a lot about salinization and reduction in fresh water lenses, but water supply may not be the primary concern of high-latitude islands. Any increase in polar front storms would be an issue with respect to transport and property damage. Small islands which are not autonomous states are presumably less vulnerable to climate change, since they are supported by their national governments - is this true or not?</p> <p>Contributing Authors: there are only 3, which is far too few. This is the perfect opportunity for the chapter to build its expertise on high-latitude and non-autonomous small islands.</p> <p>There are something like two figures and two tables. The best way to convey information to the IPCC readership (ie., non-specialist) is through figures and tables. Under my comment about the SPM and Technical Summary, there are some suggestions.</p> <p>This chapter provided very little material which is suitable for use in the SPM/Technical Summary, which is a pity since Small Islands are such an important issue. We seek more quantitative statements with respect to impacts at certain dates, and for certain temperature increases. Good examples are Ch 4 Table 4.5 (impacts for increments of global temperature change) and Ch 11 Table 11.11 (Impacts at future timeslices under different SRES scenarios). If</p>	<p>Accepted. Concerns will be addressed in SOD, including wider use of contributing authors.</p>

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						Chapter 16 could do something like this, it would be great material for the SPM/TS. For examples of the kind of figures we are looking for, I would refer you to Chapter 4 Fig. 4.9 (map of global impacts for three different temperature changes) and 4.10. Fig 4.10 is a sectoral burning embers diagram, but could be easily adapted for the regional case. (Jean Palutikof)	
16-1	A	0				GENERAL COMMENT: Reviewers were asked to suggest ways to reduce pages. There are a several long paragraphs throughout the document, some of which have been indicated above, where tighter writing and better grammar could reduce the paragraphs and reduce pages. Overall the document follows guidelines and provides some good references, good coverage of the future impacts and vulnerabilities, and information. (Cheryl Anderson, University of Hawaii Social Science Research Institute)	Accepted
16-2	A	0				a good chapter. It explains the physical bases of vulnerability better than the social stressors, and the sections on adaptation could also perhaps be strengthened (some suggestions below). Some paragraphs seem out of place and some require conclusions. Use of 'globalisation' throughout the chapter seems like vague shorthand for more specific processes that could be identified – for example trade liberalisation, or deteriorating terms of trade.... (Jonathon Barnett, University of Melbourne)	Accepted
16-3	A	0				I include also the following references in case they should be useful: Hay, Mimura, Campbell, Fifita, Koshy, McLean, Nakalevu Nunn, and de Wet 2003. Climate Variability and Change and Sea-Level Rise in the Pacific Islands Region: a Resource Book for Policy and Decision Makers, Educators and Other Stakeholders. South Pacific Regional Environment Programme, Apia, Samoa (see document in PDF form): http://www.sprep.org.ws/climate/doc/documents/Prelims.pdf (Sofia Bettencourt, The World Bank)	Accepted
16-4	A	0				Overall given the space constraints this chapter is quite good - however it can definitely be shortened in parts (beware repetition) and expanded in others to include missing elements. My concern is that it might not provide enough of the new scientific information that SIDS are looking for in relation to their specific issues.	Accepted

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						(Pasha Carruthers, Cook Islands National Environment Service)	
16-5	A	0				<p>In my view, the vulnerability of small islands has been over-stated in relation to their inherent adaptive capacities in much of the literature, and this chapter tends, somewhat, to do the same. There can be no question that the islands are highly exposed in a biophysical sense. There is little question also that adaptive capacity is constrained by a range of social and economic conditions, not least their relatively weak economies. All the same, as the chapter notes in a couple of places, there is strong social resilience to environmental hazards and change (though I accept that this is being undermined to some extent). We should acknowledge that relative to many other parts of the developing world, islanders enjoy reasonable nutrition and they are less afflicted with disease. Institutionally, we have seen strength in AOSIS and other regional organisations (e.g., SPREP), which indicates another dimension of social capacity to respond. So, I don't take issue with the fact that island nations are amongst the most vulnerable, given especially their biophysical characteristics. But at the same time it is important to acknowledge that there is social capacity and that this is greater than in some other places. The chapter might draw out this balance just a bit more.</p> <p>(Chris Cocklin, Monash University)</p>	Text will be amended and appropriately referenced to address these concerns. However, it should be noted that there is a dearth of published literature to support some of the reviewer's statements.
16-6	A	0				<p>Consideration could be given to providing some details relating to Insurance and Re-Insurance e.g. 2004 Report by world's largest re-insurance Swin Re provides results of research on the potential price tag of global warming. The overall economic costs of catastrophes related to climate changes threaten to double to \$150 billion in a decade. The share of the losses by the insurance industry could vary between 30-40 billion annually.</p> <p>Will there be a way to reference the report in 2005 by NOAA of the Biggest Bleaching Report in the Caribbean associated with High Ocean Temperatures. Possible Additional Reference: Roach J. (2003). Caribbean Corals in Dire Trouble, Study Finds. National Geographic News, July 22.</p> <p>Direct Reference for consideration: "Little can be done to guard against the loss of critical habitats such as coral reefs, mangroves, and sea-grasses and/or to arrest the modification of ecosystem functioning other than ensure that such loss is minimized so that these habitats can have the highest possible resilience to whatever impacts that occur (Mahon, 2002)</p> <p>The majority of fisheries in the Caribbean are small scale, involving the use of open vessels with outboard engines that are highly vulnerable to the effects of extreme weather events. Any intensification in the seasonal cycle that brings extreme</p>	<p>Text will be expanded to deal with relevant insurance and reinsurance details.</p> <p>Coral reef bleaching reference will be checked and cited appropriately.</p> <p>Mahon 2002 references are noted and will be considered.</p>

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						events into the first quarter of the year (in which pelagics can be fished or during the second half of the year, can significantly affect the livelihoods of fishers, and reduce the consumption of fish which is an important source of protein (Mahon, 2002). (Christopher Corbin, United Nations Environment Programme Regional Coordinating Unit)	
16-7	A	0				An excellent overview, with only minor comments (Michael James Crabbe, University of Reading)	Noted
16-8	A	0		17		It is necessary to improve Figure 6.2, because their interpretation is difficult. (Cristobal Felix Diaz Morejon, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Accepted. Will work on figure
16-9	A	0				I suggest the inclusion of a list of acronyms (Cristobal Felix Diaz Morejon, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	There will be a glossary containing acronymns.
16-10	A	0				I found this chapter to be thorough and even-handed in representing the ways in which small islands, with their tremendous variety of climates, geological settings, and socioeconomic characteristics, are likely to be affected by climate change. The following are suggestions to consider for increasing accuracy and scope. Additional references: Caldeira, K. and M.E. Wickett. 2003. Anthropogenic carbon and ocean pH. Nature 425: 365. Drew, W.M., K.C. Ewel, R.L. Naylor, and A. Sigrah. 2005. A tropical freshwater wetland: III. Direct use values and other goods and services. Wetlands Ecology and Management (in press). Drexler, J.Z. and E. DeCarlo. 2002. Source water partitioning as a means of characterizing hydrologic function in mangroves. Wetlands Ecology and Management 10: 103-113. Falanruw, M.V.C. 1994. Food production and ecosystem management on Yap. Isla 2:1.Rainy Season: 5-22. Hezel, F.X. 2001. The new shape of old island cultures. Univ. Hawaii Press, Honolulu. (Katherine Ewel, Retired)	Will check citations and insert relevant text.
16-11	A	0				Appears to be little acknowledgement of on going activities - development / new initiatives. Standardise the term "climate change, climate variability, sealevel rise and extreme events" throughtout the document and up front. Then suggest that the document as opposed to taking various shapes of this "cc,cv,slr & ev" actually just refer to "climate change" as an all encompassing term through out the chapter.	Accepted

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						Would be good to see a balance of examples and comments between the Pacific and the Caribbean through out the text. (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	
16-12	A	0				General comment: This chapter is well organized and is a good review, making some important points. Some of the issues raised have wider applicability and deserve to be considered for the synthesis chapters and cross-cutting themes (see specific comments below). (Donald Forbes, Bedford Institute of Oceanography)	Noted
16-13	A	0				too brief. There is considerably more detailed research on health effects that I am aware of, that has not been included. Eg UNFCCC country reports, World Bank report entitled "Cities, seas and storms", models of vector borne disease transmission (Malaria, dengue) in relation to climate (Simm Hales, University of Otago)	Health section will be revised.
16-14	A	0				This is a relatively short chapter packed full of information. Current and future vulnerability/impacts are covered in detail and issues regarding adaptation and sustainable development are addressed. The pertinent issues regarding water resources, coastal systems, agriculture etc are discussed with emphasis placed on the importance of precipitation changes in the future. The executive summary is thorough, covering the salient points raised in the remainder of the chapter. This chapter would benefit from English language editing. There is no summary of the advances that have been made since TAR – this would be useful. (Claire Hanson, University of East Anglia)	Noted. Language will be edited. The focus of the chapter is an assessment of findings post-TAR.
16-15	A	0				the chapter states (p6, line12-13) that it deals with 'small islands in the continental and large archipelago countries' but this is not apparent in the text? Is this an issue that the IPCC Secretariat needs to resolve in terms of what islands are included in this chapter? is it about small island states only? or does it include islands such as New Caledonia (part of France) or quasi small island states such as dependencies (eg Pacific islands of Tokelau, Guam and Americam Samoa)? should it include any small islands of the Indonesian archipelago? the use of the term 'Small Island' or 'small island' needs to be consistent - p3, line 14 it is in title case and singular?, elsewhere (p18, lines 42, 44 and 46) it is in both lower case and title case? (Nick Harvey, University of Adelaide)	Will deal with small islands in the continental & large archipelago countries, to the extent that the literature permits. Will be consistent in choice and usage of terminology.
16-16	A	0				In many parts of the text the correct use of commas would improve readability and comprehension; grammatical and typographical errors need to be corrected. There are many statements which require at least one supporting reference; often	Accepted

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						<p>the references that are provided are pre TAR, even though more recent literature is available; for Section 16.2 onward it is desirable to refer to more recent literature, and not to the TAR, as happens frequently; also, post TAR secondary references are often used, when the primary reference is in fact pre TAR.</p> <p>Many of the comments I made on the ZOD, as well as suggested references, are not reflected in the FOD - the comments are not repeated here (see review of ZOD).</p> <p>There is still a bias towards the Pacific in the FOD</p> <p>Need consistency in capitalization (or not) of "small island states" (John Hay, University of Waikato)</p>	
16-17	A	0				<p>general comment on coastal area and coral reefs. In general, many examples for non-climate stresses (in the case of coastal area and coral reefs, artificial construction, over-fishing, nutrient input, increasing (by agriculture) or decreasing (by dams) sediment supply, pollutants.. are shown. I understand these non-climate factors put cumulative stresses to coastal areas and coral reefs. However, the scope of IPCC is not for environmental issues in general, but for global climate change, and the readers want to know how these local stresses act to degrade the coastal area and coral reefs in combination with global environmental changes.</p> <p>(Hajime Kayanne, University of Tokyo)</p>	Accepted
16-18	A	0				<p>This chapter is well written and easy to read. The main statements and conclusions, however, are heavily dependent on hypothetical assumptions, and differ considerably from what we are likely to experience in the next 100 years with respect to changes in climate and sea level. References are primarily from within the "IPCC-family".</p> <p>(Nils-Axel Mörner, Paleogeophysics & Geodynamics)</p>	<p>Noted. Will respond to specific comments of reviewer.</p> <p>We disagree with last statement.</p>
16-19	A	0				<p>conclusion - conventions binding SIDS???</p> <p>(David Obura, CORDIO East Africa)</p>	Lead Author (R.P) will make contact and discuss with reviewer.
16-20	A	0				<p>It is assumed that small islands should invest in implementing "adaptation measures". However in this issue two possible types of scenarios might require separate analysis:</p> <p>A posterior scenario: impacts from previously occurred changes (climatic and/or other causes) are already noticeable and thus measures to be implemented address a concrete situation or ecosystem state.</p> <p>A priori scenario: future impacts from probable changes are forecast able, but have not yet occurred. Decisions on measures to be adopted will face both type 1 and type 2 errors. It is difficult to establish what "adaptation measures" might mean. Furthermore the expression "adaptation measures" is used with two different meanings: 1 - mitigation measures, that is the implementation of actions to</p>	Various sections of the text will be revised/rewritten to address these concerns.

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						<p>counteract environmental impacts, e.g. building infrastructures for beach protection against erosion;</p> <p>2 - adoption of new strategies, e.g. socio-economic, to replace a previous source of income, e.g. a beach disappeared, thus tourism in the mountains is promoted.</p> <p>In general, some of the terms are used in this Chapter with an unorthodox meaning. Additionally to “Adaptation measures”; “resilience building”, meaning (eco)system management aiming at long-term sustainability. (Maria Rosa Paiva, Universidade Nova de Lisboa)</p>	
16-21	A	0				<p>General Comments: A considerable improvement has been noted in the FOD compared to the ZOD. There are now less confusion and repetitions . However, some editing is required, which, no doubt, will be taken care of in the final draft. Nonetheless, attention has been drawn in this respect in some cases. It has been pointed out previously by several reviewers of the other chapters that Climate Change will also have some positive impacts. Not enough is written on this aspect. This should be brought out somewhere in the chapter to avoid recurrence of this remark but it should be stressed that negative effects by far outnumber those positive benefits for SIS. (Sachooda Ragoonaden, Retired)</p>	Accepted
16-22	A	0				<p>In general, the referencing is not good. The illustrations are not good or sufficient. The focus is on tropical islands, and (with exception of a bit from the Mediteranean) cool climate islands are mostly ignored. (charles sheppard, university of warwick)</p>	Will broaden referencing to include middle and high latitude islands, to the extent that the literature permits.
16-23	A	0				<p>How are 'small islands' defined? Topography is critical - small but high volcanic islands are very different from small, low lying islands. Some of the islands discussed in the text don't seem that small at all - Mauritius for example. (Thomas SPENCER, Cambridge University)</p>	<p>Will make distinction between high (volcanic) and low islands.</p> <p>We disagree with last sentence.</p>
16-24	A	0				<p>I agree with the idea to build the resilience through adaptation it would be very useful for the SIS. The points of view developed in the adaptation section are new and very useful and interesting. Congratulations. (Avelino Suarez, Ecology and Systematic, Cuban Environmental Agency.)</p>	Noted
16-25	A	0				<p>General comment - I tried where possible to introduce some more Caribbean research. (Adrian Trotman, Caribbean Institute for Meteorology and Hydrology)</p>	Noted. Will follow up in specific comments.
16-26	A	0				<p>I'm dissappointed to see that this chapter doesn't include the impact of high seawater CO2 on corals, perhaps the greatest threat to corals, to the ecosystems they support and to the goods and services they offer to small islanders. Essentially,</p>	Issues fully explored in chapters 4 and 6. Will cross-reference appropriately.

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						ocean uptake of anthropogenic CO2 will be such that coral calcification will be significantly reduced. Check out the Royal Society Report for more details and further references (http://www.royalsoc.ac.uk/document.asp?id=3249). Also there seems to be little mention of coral bleaching and impacts of this. This chapter needs to cross reference to chapter 6 where both coral bleaching and ocean acidification are mentioned. The combined impact of warming oceans, coral bleaching, ocean acidification, sea level rise, increased storminess, increased fishing and damage due to fishing need to be mentioned as being particularly pertinent for small islands. (Carol Turley, Plymouth Marine Laboratory)	
16-27	A	0				"We will need a map to indicate the location of the countries." (Hiroya Yamano, National Institute for Environmental Studies)	Noted. See page 6, lines 11-14.
16-28	A	1	1	34	17	This FOD is a greatly improved version compared to the ZOD. However, the information added since TAR is minimal. Again, I find that the Chapter is highly biased towards Small islands in the Pacific and Indian Oceans. However the document is well written. Also, only some of my comments on the ZOD have been taken into account in this FOD. (Bhawan Singh, Université de Montréal)	First statement noted. In many cases, the science has changed little since TAR. Will provide greater balance between regions. All comments on ZOD considered, but not all accepted.
16-29	A	3	1	5	6	Executive summary - while this chapter highlights the vulnerability of SIDS, it might also be worth pointing out the even more extreme vulnerability of low-lying coralline/flat islands - both to sea level rise and freshwater supply, as compared to high islands. Perhaps this comes up later, but my feeling is that it is a clear additional distinction that is not yet being made. This is mentioned in page 5 line 28. I see this does come up later, and e.g. in the conclusions, p26 116 and on, but it could be stronger in the exec summary. (David Obura, CORDIO East Africa)	Accepted
16-30	A	3	1			Executive summary COMMENT: All initials such as TAR, SST, EEZs, should be explained when used for the first time (that is in the executive summary). (Maria Rosa Paiva, Universidade Nova de Lisboa)	Documents has glossary of acromins.
16-31	A	3	1			Executive Summary: this sets out the main findings of the chapter, but these are unexciting. Some more quantitative statements about impacts at certain dates and under certain temperature increases would much improve the ES - see my comment on the need for material for the SPM/TS. (Jean Palutikof, Hadley Centre)	We agree. Will make attempt to find the literature, if it exists.

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16-32	A	3	3	3	3	I propose to change "The findings of the AR - 4" by "The search in the preparation of AR-4...." (Cristobal Felix Diaz Morejon, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Rejected
16-33	A	3	4	3	4	I propose to change global warming by global changes (Cristobal Felix Diaz Morejon, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Rejected. The two terms are not same.
16-34	A	3	4			ie the term global earming is used - as above just use "climate change" (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Accepted
16-35	A	3	5			"man-induced" should be "human-induced" - promotes gender equity in document language (Cheryl Anderson, University of Hawaii Social Science Research Institute)	Accepted
16-36	A	3	5	3	5	should be human not 'man' (Pasha Carruthers, Cook Islands National Environment Service)	Accepted
16-37	A	3	5	3	5	To add:and limited ability AND POSSIBILITIES..... (Cristobal Felix Diaz Morejon, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Rejected
16-38	A	3	5			'man-induced' should read human-induced or artificial (Nick Harvey, University of Adelaide)	Accepted
16-39	A	3	5	3	5	Use gender neutral language (John Hay, University of Waikato)	Accepted
16-40	A	3	7			add text ...beneficial to adaptation planning & mitigation. (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Accepted
16-41	A	3	10	3	14	Low lying atoll states are particularly at risk - as recognized by the Communique of the High Level Adaptation Meeting in the Pacific (attached to this review). (Sofia Bettencourt, The World Bank)	Not accepted. The two references cited are policy documents. No action taken.
16-42	A	3	10			Standardise the term "climate change, climate variability, sealevel rise and extreme events" (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Accepted. Will use the IPCC definition of climate change.
16-43	A	3	10	3	14	suggestion: add short-term planning and lack of vision of leaders (June Marie MOW, Fundacion Providence)	Not accepted. This is a political statement. No action required.
16-44	A	3	10	3	14	A special characteristic of small islands that influences most climate change issues is the long coast line, relative to land area. --- this is mentioned at 16.4.2, but it is fundamental and one might suggest that the coastal index (ratio of coast line length to area, per Arthur Dahl's Islands Database) is a good indicator for island vulnerabilty to climate change. (Bruce Potter, Island Resources Foundation)	Accepted.

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16-45	A	3	12			'ect' should be deleted and all characteristics listed (Jonathon Barnett, University of Melbourne)	Accepted.
16-46	A	3	12			avoid use of 'etc' as it sounds vague (Nick Harvey, University of Adelaide)	Accepted.
16-47	A	3	14	28	44	Throughout document - sometimes small islands are capitalised, sometimes not, need to be consistent - depending on whether you are talking about Small Islands States or small islands as geographic entities. In this first instance island also needs to be pluralised (Pasha Carruthers, Cook Islands National Environment Service)	Accepted.
16-48	A	3	14			Island should be plural (charles sheppard, university of warwick)	Accepted.
16-49	A	3	17	3	20	See also page 5, lines 15 to 17. This statement is confusing to readers since it seems contradictory: a 0.1 degree Celsius temperature increase from small island states is smaller (not larger) than the global average of 0.6 degrees Celsius. Needs clarification. (Sofia Bettencourt, The World Bank)	Accepted. Will revised the text.
16-50	A	3	17		20	Is there any available data on sea temperature changes for the region which would be useful here? (Christopher Corbin, United Nations Environment Programme Regional Coordinating Unit)	Noted. Will check the literature.
16-51	A	3	17	3	20	It is unclear whether the mean temperature rate increase "for the last Century" of 0.1 deg C per decade rate applies to the whole globe or just to the main Small Island regions. I'm guessing that this is the regional rate because it does not match the mean global rate of 0.06 deg C per decade for 1901-2000 (TAR). In the last sentence, "the global average of about 0.6 deg C" is unclear. This is the global average increase in air temperature from 1901 to 2000. Without saying so explicitly, the reader is apt to assume this is a per decade rate. (Thomas Giambelluca, University of Hawaii at Manoa)	See above.
16-52	A	3	17			These trends are controversial. INQUA's recent Commission on Sea Level Changes and Coastal Evolution targeted the Maldives and found "a total absence of any recent sea level rise." Moreover it found "a young (last 20 years) sea level fall." The peer-reviewed paper, "New perspective for the future of the Maldives" by N.A. Mörner et al. has just been released in the prestigious Global and Planetary Change. It describes early peoples surviving on the Maldives around 1000 years ago, when sea level was approximately 50?60 cm higher than at present. The INQUA commission concludes: 'In the region of the Maldives, a general fall of sea level occurred some 30 years ago. The origin of this sea level fall is likely to be an	CHECK WITH ROGER AND LEONARD.

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						increased evaporation over the central Indian Ocean [...] there seems no longer to be any reasons to condemn the Maldives to become flooded in the near future.' (Hans H.J. Labohm, Netherlands Institute of International Relations 'Clingendael')	
16-53	A	3	17		18	The rise is exaggerated. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Noted. No action taken.
16-54	A	3	17	3	20	It is not clear if the Pac/Car average is 0.6 that exceeds global average of 0.1, or if average for islands is .1, global average is .6 and Pac/Car exceeds even this. (David Obura, CORDIO East Africa)	See comments on this matter above.
16-55	A	3	17	3	20	I note that the discussion of temperature observations describes regional differences between the Pacific and the Caribbean; is it possible to include a similar, region-specific summary of sea level observations? (Eileen Shea, East-West Center)	Noted. Will check the literature.
16-56	A	3	18		19	Not at all! No observational data give such a high rise. See Mörner (2004, 2005a, 2005b) with the following locations; (1) Global Planetary Change 40: 49-54, 2004, (2) Z. Geomorph. N:F., Suppl.Vol. 137: 91-102, 2005, and (3) "Facts and fiction about sea level changes", Report to the House of Lords, Economic Affairs Committee, 6 pp. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Noted. Will check the cited references and draft new text.
16-57	A	3	19	3	20	Executive summary:and again the same sentence on Page 5, lines 16-17. "The rate of increase in air temperature in the Pacific and Caribbean exceeded the global average of about 0.6°C" COMMENT: The sentence is not clear : 0.6°C per ? (Maria Rosa Paiva, Universidade Nova de Lisboa)	See above.
16-58	A	3	19	3	20	unclear meaning. A rate should be measured as .6 deg PER DECADE / YEAR etc. Or do you mean the amount of increase? (charles sheppard, university of warwick)	Accepted.
16-59	A	3	20	3	20	To aid comparison, and avoid confusion, the global average should be in the same units as the values for Small Islands - also p 5, line 17 (John Hay, University of Waikato)	Accepted.
16-60	A	3	22	3	24	It should state "depending on the area". In fact, in the Pacific, there is now a much better agreement about which areas will experience higher rainfall and which will experience lower rainfall. See Hay et al (2003) and Bettencourt et al (2005) both provided with this review. (Sofia Bettencourt, The World Bank)	Noted. No action required. The references cited are policy documents.
16-61	A	3	23	3	24	Please clarify the wording "for three 30-year periods by the end of this Century" (Klaus Radunsky, Umweltbundesamt GmbH)	Noted.
16-62	A	3	23	3	24	either omit 3 30 yr periods or say when they are (charles sheppard, university of warwick)	Accepted.

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Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
16-63	A	3	24			Some comment at this stage on the impact of climate change to SSTs would be helpful (Michael James Crabbe, University of Reading)	Noted.
16-64	A	3	25	3	29	reference to Pacific , Indian Ocean? Based on main document suggest broadening this reference to changed SST ocean structure to include tropical oceans? (Pasha Carruthers, Cook Islands National Environment Service)	Noted.
16-65	A	3	25	3	32	inconsistent use of 'cyclone' and 'hurricane' - while they are different terms for the same phenomena depending on the hemisphere, another term 'typhoon' is not used - it is better to use one term and be consistent (Nick Harvey, University of Adelaide)	Accepted. Will revise the text.
16-66	A	3	25	3	28	I'm concerned about the use of the word "unprecedented"; are there published documents that provide documentation that the 1995 hurricane season is, in fact, unprecedented in more than modern memory? Also, I note that the second sentence of this bullet refers to 'vertical shear' while the lead-in discussion of variations in tropical cyclone activity in the Caribbean refers only to Atlantic Ocean SST; this bullet may need a bit of clarification. Finally, I wonder if there aren't some published articles on the relationship of SST to tropical cyclone variation in other ocean basins. (Eileen Shea, East-West Center)	Accepted.
16-67	A	3	27			Hurricanes referenced to the Caribbean - the Pacific has cyclones - may by the need to distinguish. (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Noted.
16-68	A	3	29	3	29	To add at final of pointthe long-term warming trend. THEIR UNUSUAL INTENSITY(ANY WITH CATEGORY 5 IN THE SCALE SAFIR-SIMPSON) IS INFLUENCED BY FAVOURABLE CONDITIONS OF HIGH TEMPERATURE IN SEAWATER IN CARIBBEAN SEA (Cristobal Felix Diaz Morejon, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Good comments but need reference. No action taken.
16-69	A	3	30			Reference to cyclones - which area ?? (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Noted.
16-70	A	3	30			Pacific is also impacted on by tsunamis - need a reference to this impact (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Noted but tsunamis are not covered in this assessment.
16-71	A	3	30	3	32	Perhaps it is too late for inclusion in AR4, but several recent papers are very relevant to the issue of trends in tropical cyclone characteristics and possible linkages with global warming. The results presented in these papers show that, globally, the number of tropical cyclones has not changed, nor has the maximum intensity of the storms. However, the number of intense storms, defined as	Accepted. Will review the cited papers and relevant text.

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						Category 4 and 5 tropical cyclones, has increase significantly. The relevant citations are: Emanuel, K.A., 2005. Nature, 436, 686. Trenberth, K.E. , 2005. Science, 308, 1753. Webster, P.J., G.J.Holland, J.A. Curry and H-R Chang, 2005. Science, 309, 1844-1846. I recommend that these papers be cited here and in the appropriate chapter of the AR4 WGI report. (Thomas Giambelluca, University of Hawaii at Manoa)	
16-72	A	3	30		31	By 2050 we will be in a new Solar Minimum (Mörner 2005b) with a totally different climatic-eustatic situation. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Noted. No action taken.
16-73	A	3	30	3	30	"wind" intensity (to be consistent with language in IPCC TAR) (Eileen Shea, East-West Center)	Agreed.
16-74	A	3	31	3	32	Possible links between ENSO and Climate Change at least in terms of conditons need to be established in this chapter or reference made to TAR/ AR4 WGI study of this. Suggest deleting or moving this statement up to line 29. (Pasha Carruthers, Cook Islands National Environment Service)	Noted. Will check the peer reviewed literature on ENSO.
16-75	A	3	31	3	32	I would encourage a separate bullet on the influence of ENSO on tropical cyclones with a discussion of observed trends and future projections. (Eileen Shea, East-West Center)	Accepted.
16-76	A	3	31	3	31	also recalling IPCC TAR, wasn't there also a projection of an increase in mean as well as peak precipitation or is Fourth Assessment Report projection of an increase related only to peak precipitation? (Eileen Shea, East-West Center)	Noted. Chapter 11, WG 1, AR4 looks at projections.
16-77	A	3	34			Key future impacts and vulnerabilities: Since the FAR, the potential impact of sea-level rise on small islands, particularly atolls, and more specifically small-island states without no high islands, has been recognized as a unique threat. Although the upper limit of projected sea-level rise to 2100 has progressively diminished through to the TAR and the FOD of AR4, this is still a particular concern with implications for cultural survival, safety, and sovereignty in Tuvalu and elsewhere. On a practical level, sea-level rise has a broader range of impacts on many small islands than the specific implications for freshwater resources, agriculture, and health noted in individual bullets in this section. I suggest including a bullet specifically on the impacts of sea-level rise, including issues of inundation, enhanced erosion, and role in enhancing impacts of extreme events. (Donald Forbes, Bedford Institute of Oceanography)	Accepted
16-78	A	3	34			Executive summary, key impacts/vulnerabilities. This section does not mention the really interesting point that adaption to climate change itself should be seen as a mechanism for resilience-building (from 16.5.4). My feeling is the freshness of this	Noted and agree

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						concept is powerful, and should be highlighted upfront. (David Obura, CORDIO East Africa)	
16-79	A	3	35			Some attempt at quantification of impacts in financial terms would be useful here (Michael James Crabbe, University of Reading)	Agree, and will attempt to find literature if it exists
16-80	A	3	35			Add "s" to observations (Sachooda Ragoonaden, Retired)	Accepted
16-81	A	3	35	3	35	...based on projections, vulnerability assessments and observations... Recent vulnerability assessments themselves (including work summarized in National Communications as well as work done by scientific institutions) are another source of support for the idea that the effects of climate change will "largely be adverse" at least in the Pacific. (Eileen Shea, East-West Center)	Accepted. Add "vulnerability assessment"
16-82	A	3	37	3	42	"changes and distribution" is unclear - need to clarify that former refers to mean and latter to, presumably, the variance, and not to the spatial pattern; also, undesirable for all examples refer to mean conditions - also p12, line 7 (John Hay, University of Waikato)	Rejected
16-83	A	3	38	3	41	Kiribati is not now considered a good example of reduction in rainfall, since most recent validated models seem to point to an increase in average rainfall. Please contact Tony Falkland - who did the most recent water modelling in Kiribati - for further information. (Sofia Bettencourt, The World Bank)	Noted. Need to access the reference
16-84	A	3	39			see above for 2050 situation. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Noted
16-85	A	3	40	3	40	Should be "an island", unless this refers directly to Tarawa. (David Obura, CORDIO East Africa)	Delete "atoll" to clarify
16-86	A	3	40	3	41	it is the sea level rise which reduces the lens, not the shrinking of the island (which is a trivial component). Suggest start sentence at: "Sea level rise is likely to..." (charles sheppard, university of warwick)	Accepted
16-87	A	3	42	3	42	To add at final of pointsea-level rise would compound this threat. This negative process will carry the apparition of prolonged drought periods, that will affect the water availability and the normal access of the population to drinking water (Cristobal Felix Diaz Morejon, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Rejected
16-88	A	3	43	3	47	While there is the evidence to support the claim that coral reefs are likely to suffer from climate change, is there the same quality of evidence to show that fisheries "and other ocean-based resources" will be heavily impacted? My understanding is that the knowledge in respect of the latter two is much more tentative, and certainly	Will re-consider and make adjustment as necessary

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						the limited evidence presented in 16.4.3 would support this view. It seems, therefore, that this point might be expressed somewhat more tentatively than it is. (Chris Cocklin, Monash University)	
16-89	A	3	43	3	47	Additionally the importance of regional governance and transboundary management agreements should also be discussed (June Marie MOW, Fundacion Providence)	Noted
16-90	A	3	43	3	43	The coral reef and other fisheries/ocean literature shows that they are already being impacted by climate change. This statemtn could be stronger, depending on the findings in the relevant earlier chapter (and see line 24 on next page). (David Obura, CORDIO East Africa)	Will re-consider and make adjustment as necessary
16-91	A	3	44			what are EEZs? (Claire Hanson, University of East Anglia)	Will be listed in glossary
16-92	A	3	44			insert 'relatively' to indicate the large EEZ relative to small land area (Nick Harvey, University of Adelaide)	Accepted
16-93	A	3	44	3	44	Most, but not all, small island states have large EEZs (John Hay, University of Waikato)	Noted
16-94	A	3	44	3	44	Please clarify the wording "Small island states have large EEZs" (Klaus Radunsky, Umweltbundesamt GmbH)	Rejected
16-95	A	3	44	3	45	Small Island States. I suggest these be used throughout the paper (Joeli Veitayaki, University of the South Pacific)	Rejected
16-96	A	3	45	3	47	the last statement in relation to implications of oceans management seems more political and less science based than that of the content of the report being summarised, which notes more livelihood/survival vulnerability (Pasha Carruthers, Cook Islands National Environment Service)	Noted
16-97	A	3	45			use of 'sustainable exploitation' is confusing with other terms such as 'sustainable management' (p3, line 47) and 'sustainable development' (Section 16.6) illustrating both over-use of the term sustainable and also subtle differences between conserving coastal resources for future generations and exploiting them while attempting to ameliorate impact (Nick Harvey, University of Adelaide)	Term widely used in fishery's literature
16-98	A	3	45			Capital letters for i and s in Small island states (Sachooda Ragoonaden, Retired)	Noted
16-99	A	3	50	4	2	This example (World Bank 2000) applies specifically to Viti Levu (Fiji) (for the 2-3 percent example) and Tarawa, Kiribati (for the 17-18 percent). It may not be representative of other island countries, so I would suggest specifying " for a low-lying atoll country such as Kiribati (for 17-18 percent) and a high island such as Viti Levu in Fiji (for the 2-3 percent).	Agreed, and change "2 to 18 %"

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						(Sofia Bettencourt, The World Bank)	
16-100	A	3	50	3	50	add reference to extreme events in list (both drought and flood affect soil fertility, fungal and other diseases) which affect agriculture and food security (Pasha Carruthers, Cook Islands National Environment Service)	Noted
16-101	A	4	0	4		To include in Adaptation and sustainable development " The installation of early warning systems that permit to detect extreme natural events. The utilization of early warning systems will be of first priority and a necessity for the survival of islands (Cristobal Felix Diaz Morejon, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Noted. See previous IPCC assessments, and Regional Impact of Climate Change
16-102	A	4	1			2-3 percent UPTO 17-17 percent (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	See above.
16-103	A	4	1	4	2	This statement on the range of economic impacts from CC on agriculture in small islands is confusing as presented in the Exec Summary. It clearly reflects the ranges in two case studies quoted on p. 15 but this is not clear to someone coming straight to the Exec Summary. I did not understand on first reading why a range would be delimited by two ranges. A suggested rewording could be: "... the economic damage could reach as high as 18% of 2002 GDP on the most vulnerable low islands." (Donald Forbes, Bedford Institute of Oceanography)	See above.
16-104	A	4	1			wouldn't it be better to say 'could reach 2-18 percent'? (Nick Harvey, University of Adelaide)	See above.
16-105	A	4	1			Not clear if this statement means the cumulative damage from 2002 to 2050, or the ANNUAL cost as at 2050. (Bruce Potter, Island Resources Foundation)	Will clarify statement
16-106	A	4	1			why not say 2-18% of the 2002 value (charles sheppard, university of warwick)	See above.
16-107	A	4	2	4	2	circumstances should be added to the end of the sentence (Pasha Carruthers, Cook Islands National Environment Service)	Delete "countries"
16-108	A	4	2			see above about Solar Minimum around 2050 (Mörner, 2005b). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Noted
16-109	A	4	3		9	Bullet point long and confusing. Should not specify region "Pacific" and "Caribbean" because "gastrointestinal diseases" (proper term for the range of diarrheal diseases) and dengue fever transmission are not particular to one island region and occur in both. These issues have been discussed in a number of WHO island workshops, and research by the East-West Center and the University of Hawaii. For the bullet, after the first sentence, list the range of public health threats.	We based statements on the published literature. We will revisit literature and modify if appropriate.

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						(Cheryl Anderson, University of Hawaii Social Science Research Institute)	
16-110	A	4	3		9	The impacts are the same for the Pacific and the Caribbean hence should be acknowledged. Also suggest that the lines 7-9 text from " Shortages of , and dengue fever." be moved up to follow on from ... health. (in line 4) (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Delete sentence " Caribbean....trasmission"
16-111	A	4	3	4	9	This bullet refers to health impacts on small islands. The effects of sea-level rise (SLR) are indirect and arise primarily in the context of pollution. The bullet should refer to compounding stresses of this sort and specific mention of SLR is perhaps not necessary in the first sentence. However, as noted earlier, the broader threats to low islands and key infrastructure on coastal lowlands of high islands are not mentioned explicitly in this section on key future impacts and vulnerabilities. (Donald Forbes, Bedford Institute of Oceanography)	Noted
16-112	A	4	3	4	9	The last sentence repeats much of the preceding content; it should be the second sentence in the para. (John Hay, University of Waikato)	Will rewrite the section.
16-113	A	4	3	4	9	This paragraph repeats the ideas; suggest to summarize (June Marie MOW, Fundacion Providence)	See above
16-114	A	4	3	4	9	Recent climate assessment work in the Pacific at least also highlights the potential impact on human health associated with changes in diet that result from climate change impacts on subsistence crops and fish (e.g., Shea, 2001, p.39) (Eileen Shea, East-West Center)	See above
16-115	A	4	4			.. Rate of diarrhoea WILL increase ?? Is this proven?? May be use - is likely to increase? (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	See above
16-116	A	4	4			Inaccurate -- see Singh et al, 2001 -- in Fiji, diarrhoea increased with high rainfall as well as low rainfall (Simm Hales, University of Otago)	We will revisit literature and modify if appropriate.
16-117	A	4	4			Pacific Islands. These should be used throughout. (Joeli Veitayaki, University of the South Pacific)	Noted
16-118	A	4	6			Cannot say will necessarily increase incidence, only that there will be an increase in transmission potential (Simm Hales, University of Otago)	Accepted
16-119	A	4	6			Diseases are only marginally, if at all, affected by modest climate change, whatever its origin. (Hans H.J. Labohm, Netherlands Institute of International Relations 'Clingendael')	Rejected. Nor our interpretation of published literature.
16-120	A	4	6			Other experts have other opinions (e.g. P. Reiter).	Noted

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						(Nils-Axel Mörner, Paleogeophysics & Geodynamics)	
16-121	A	4	7	4	8	there have been studies done in the pacific too, not clear from the body of the text why Carribean at "greatest" risk (Pasha Carruthers, Cook Islands National Environment Service)	Noted
16-122	A	4	7			Singapore, not Caribbean, has a great risk right now. Why add this clause? (charles sheppard, university of warwick)	Will delete the reference to Caribbean
16-123	A	4	7			Countries (Joeli Veitayaki, University of the South Pacific)	Rejected
16-124	A	4	8	4	8	To add after ----contamination of water supplies BY UNTREATED WASTEWATERS AND during flods and storms...." (Cristobal Felix Diaz Morejon, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Rejected. Point implied already covered
16-125	A	4	9			delete "will" (Pasha Carruthers, Cook Islands National Environment Service)	Accepted
16-126	A	4	10		14	Would include transportation in this paragraph as a key sector/service as reflected in the text of the document. (Christopher Corbin, United Nations Environment Programme Regional Coordinating Unit)	Will add transportation sector
16-127	A	4	10	4	14	Are the vital socio-economic sectors the same mentioned below in the same paragraph such as tourism and agriculture (June Marie MOW, Fundacion Providence)	Yes
16-128	A	4	11		12	Not necessarily the case. In the Maldives, peoplse survived a 0.6 m higher sea level (Mörner et al, 2004; Global Planetary Change, 40: 177-182). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Noted
16-129	A	4	12			suggested change in text -extreme events, impacting on other key ... (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Accepted
16-130	A	4	15			perhaps "driving" is a better word than "forcing" (Pasha Carruthers, Cook Islands National Environment Service)	Rejected. We see no value in making recommended change
16-131	A	4	15	4	18	A contrary case could be argued - tourism is allowing island nations to accumulate economic resources, which will improve their adaptive capacity in the face of climate change. (Chris Cocklin, Monash University)	Rejected
16-132	A	4	15	4	18	Is globalization solely responsible for increased dependence on tourism? Or maybe because other development models have failed, tourism is more important now? Other reasons? (June Marie MOW, Fundacion Providence)	Will modify
16-133	A	4	15	4	18	this bullet may need a bit of clarification...island dependence on tourism as a key	Accept

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						economic sector would exist regardless of globalization; one could say that globalization (via increased transportation access to island destinations) may increase the volume of tourism and, thus the stress on the resources upon which tourism depends, but I don't think that it's appropriate to claim that globalization is the causing islands to increase their dependences on sectors like tourism. As currently written, the reference to increased vulnerability and exposure to external shocks seems to only relate to changes in tourism. I suspect the authors are actually thinking of a number of aspects/impacts of globalization as potentially exacerbating the impacts of climate change. (Eileen Shea, East-West Center)	
16-134	A	4	17	4	18	Include climate and environmental in the following sentence..., but also increases their exposure to external climate and environmental shocks. (David Viner, University of East Anglia)	Reject. We do not know what 'external climate shock' is. External shock is widely used in economic literature.
16-135	A	4	18			Such dependence on tourism and associated coastal development has grave consequences for coral reefs and mangroves (Michael James Crabbe, University of Reading)	Noted
16-136	A	4	18			external 'economic' shocks? (Nick Harvey, University of Adelaide)	Noted and agree
16-137	A	4	19		21	repeat of text in earlier paras - suggest delete (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Accepted
16-138	A	4	19	4	21	So they are in many coastal areas of continents too. The important bits here you have already said. Suggest delet this point (charles sheppard, university of warwick)	Reject
16-139	A	4	21	4	21	To include a point: "The destructive effects of cyclones and hurricanes make move backward the economies of affected islands inclusive 20 or 30 years of socio - economic development, and it is previsible that can to increment their occurrence and violence " (Cristobal Felix Diaz Morejon, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Rejected
16-140	A	4	24		29	need to acknowledge that there is now a Forum Leaders endorsed "Pacific Islands Framework for Action on Climate Change 2006-2015". Refer to Forum Communique October 2005. (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Noted
16-141	A	4	30	4	34	This is true for Small Island States, but for Small Islands that are part of a larger country the situation is rather different. In this case National Centralized Governments are not aware of the special features of Small Islands. Decisions are not taken locally.	Rejected

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						(June Marie MOW, Fundacion Providence)	
16-142	A	4	31	4	31	"environmental" is redundant (John Hay, University of Waikato)	Noted
16-143	A	4	33	4	34	add " or are superimposed over new dynamics of ecosystems and economics". E.g. under some current/future climate regimes traditional dry season water sources are no longer viable due to salt water intrusion and eroding coastlines (Pasha Carruthers, Cook Islands National Environment Service)	Accepted
16-144	A	4	33			change "environmental hazards" to "NATURAL hazards" (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Rejected
16-145	A	4	33	4	34	This is a very important point and one that applies in other settings as well. This is not the place to make the case, but in the body of the text a link to similar concerns in aboriginal communities in North America and elsewhere may be appropriate and this may be an issue for cross-cutting consideration in the contexts of equity and sustainability. (Donald Forbes, Bedford Institute of Oceanography)	Rejected
16-146	A	4	35	4	37	See also comment number 9; I think the discussion of the exacerbating effects of globalization in both of these bullets needs some clarification and perhaps a single, revised bullet in either this section or the preceding discussion of future vulnerabilities would be sufficient. (Eileen Shea, East-West Center)	Will review, and modify appropriately
16-147	A	4	37	4	37	Provide examples of these 'internal changes of society' - urbanisation, changing social dynamics? (Chris Cocklin, Monash University)	Accepted
16-148	A	4	38	4	42	"by addressing climate threats to sustainable development as well as being "no-regrets" to replace "even without the connection to SD" which makes little sense in the context of the report. Also I thought TAR already used the term "no regrets"? This paragraph is circular and makes no sense - suggest deleting paragraph or radically rearranging (Pasha Carruthers, Cook Islands National Environment Service)	Will modify
16-149	A	4	39		42	Grammar incorrect - should be "which lead to decreased pressure on"... "not only reduce"... "but also put" (Cheryl Anderson, University of Hawaii Social Science Research Institute)	Accepted
16-150	A	4	39	4	39	Suggest changing "connection with" to "occurrence of"; also p26, line 41 (John Hay, University of Waikato)	Will modify sentences
16-151	A	4	41			in reference to "developing countries" - again is it not better to stick to a common terminology - assume the real reference here is "small islands" (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Accepted

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16-152	A	4	43	4	47	This point about Governments needing to take action is paramount, and I would put it nearer the top of this sub-section. The keywords are policy linked to sustainability in the changing environment. (Michael James Crabbe, University of Reading)	Noted
16-153	A	4	43			Governments' should be lower case (Nick Harvey, University of Adelaide)	Accepted
16-154	A	4	43			and promote scientific resear – even if the results would not be what they had hoped and expected. In the Maldives, the government actively works against investigationsnot promoting the flooding concept because they believe that it would humper their economical support from developed countries. "Let science free!" is a natural ethical demand. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Noted
16-155	A	4	43	4	48	Very important for the protection of coastal and marine natural resources is the integrated management of public services (they should be considered in the framework of true "ecological services") (June Marie MOW, Fundacion Providence)	Noted
16-156	A	4	44	4	44	"developing" to replace "mainstreaming" as that assumes they are already in place, also the definition of mainstreaming still is not that clear,and in most cases SIDS governments don't have the resources and capacity to divert from other areas (education, health, poverty alleviation) to 'mainstream' adaptation in this context And in second half of sentence insert "incorporating" that into existing national. Alternatively delete this whole sentence (Pasha Carruthers, Cook Islands National Environment Service)	Will revisit and modify as appropriate
16-157	A	4	44			mainstreaming ...building. Horribly indigestible phrase! (charles sheppard, university of warwick)	See above
16-158	A	4	45			... Some SMALL ISLAND countries... (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Accepted
16-159	A	4	45	4	48	Reference to "national physical development plans" is ambiguous to me. Does this refer to infrastructure or other aspects as well? (Donald Forbes, Bedford Institute of Oceanography)	Will delete 'physical'
16-160	A	4	45	4	48	This sentence needs revising, to make its meaning clearer (John Hay, University of Waikato)	Noted
16-161	A	4	46	4	46	...varying degrees of ENHANCED RESILIENCE through (rather than "vulnerability reduction")? (Eileen Shea, East-West Center)	Debatable but will revisit
16-162	A	4	47		48	Useful to include integrated watershed and coastal zone management as one of the common mechanisms used.	Noted. Already said in the previous IPCC assessments.

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						(Christopher Corbin, United Nations Environment Programme Regional Coordinating Unit)	
16-163	A	4	49	5	6	It might be helpful to discuss impacts on businesses and communities separately (June Marie MOW, Fundacion Providence)	Rejeyced
16-164	A	5	4	5	4	Suggest changing "conflict" to "disagreement" (John Hay, University of Waikato)	Accepted
16-165	A	5	5	5	6	The meaning of "uncertainties associated with choice of adaptation pathways" is unclear. Are these uncertainties related to the need, the effectiveness, the side effects, or other aspects? (Donald Forbes, Bedford Institute of Oceanography)	Will modify as appropriate
16-166	A	5	12	5	12	To add after ----“(e.g. Physical size, THEIR SITUATION IN THE TRAJECTORY OF CYCLONES AND HURRICANES, VOLCANIC FORMATION IN THE MAJORITY OF CASES, proneness to natural.....” (Cristobal Felix Diaz Morejon, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Rejected
16-167	A	5	12			Small Islands (Joeli Veitayaki, University of the South Pacific)	Rejected
16-168	A	5	14	5	19	Two different values are quoted for rates of temperature rise, presumably related to differing rates at global and regional scales or in different regions or over different time intervals. The geographic domain for the first rate is unclear and the time intervals are not specified. More specifically, the second rate is specified as such but given only as a temperature (0.6°C) - i.e. if a rate, this should be in units of °C per unit of time. (Donald Forbes, Bedford Institute of Oceanography)	Will clarify
16-169	A	5	14	5	17	See comment no. 1 above regarding confusion about warming rates. (Thomas Giambelluca, University of Hawaii at Manoa)	Will modify
16-170	A	5	15			see above 3: 17-18. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Noted
16-171	A	5	16			where is the sea-level signature complicated by ENSO? - long-term sea-level trend analysis based on tidal gauge data usually allows for this phenomena (Nick Harvey, University of Adelaide)	Will modify appropriately
16-172	A	5	16	5	17	again, mixing of RATES and AMOUNTS (charles sheppard, university of warwick)	Accepted
16-173	A	5	17			The question of why the global average temperature increase is exceeded in these regions that this statement generates is not answered in the relevant section on observations (Pasha Carruthers, Cook Islands National Environment Service)	The literature does not address this either.

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16-174	A	5	21	5	28	While accepting that this is the introduction, this paragraph includes several unsubstantiated generalisations - e.g., the suggested forced reallocation of resources - are there examples of this or appropriate references? (Chris Cocklin, Monash University)	Many references exist, and we will provide them in the SOD. See for example Nurse and Moore (2005)
16-175	A	5	21	5	28	There is a strange mix of topics in this para. - suggest the logic of the TAR review be improved (John Hay, University of Waikato)	Will modify, as appropriate
16-176	A	5	21	5	31	Both the 2nd and 3rd para in this section start with "Given". Suggest a change in writing style to start one of these paragraphs. (Sachooda Ragoonaden, Retired)	Accepted
16-177	A	5	22	5	22	To add after"... And climate model projections, AND REAL EFFECTS IN THEIR TERRITORIES OF CLIMATE CHANGES (Cristobal Felix Diaz Morejon, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Rejected.
16-178	A	5	22	5	22	Need to clarify how observed data can give rise to concerns about the future - presumably by extrapolating past changes (John Hay, University of Waikato)	Noted. Reviewer posed the question and answered it.
16-179	A	5	22	5	22	...based on observational records, EXPERIENCE WITH CURRENT PATTERNS AND CONSEQUENCES OF CLIMATE VARIABILITY, and climate model projections... (Eileen Shea, East-West Center)	Accepted
16-180	A	5	26			if the TAR takes a central estimate of 4.8 mm shouldn't this read about 5 mm rather than 'about 4 mm'? (Nick Harvey, University of Adelaide)	Accepted
16-181	A	5	30		36	Reference to the additional risk from invasive species would be useful (Christopher Corbin, United Nations Environment Programme Regional Coordinating Unit)	Accepted
16-182	A	5	30			Those "projections" varies very much. IPCC has given their model-based estimates. Others have given observationally based estimates that differ considerably from the IPCC estimates (as discussed in my 2005b and 2004 papers). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Noted
16-183	A	5	30	5	31	...OTHER anthropogenic stressES, (climate change, itself, is an anthropogenic stress); this change would be consistent with language on page 7. (Eileen Shea, East-West Center)	Accepted
16-184	A	5	31			Small Islands (Joeli Veitayaki, University of the South Pacific)	Rejected
16-185	A	5	33		36	16.1. Introduction	Will clarify

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						<p>“Additionally, apart from unfavourable shifts in the biotic composition in islands, competition among some species is expected to be adversely affected.”</p> <p>COMMENT: This sentence has no scientific meaning, given that the outcomes of any interspecific interactions can not be classified as “positive” or “adverse”. If specific cases are here meant, like species extinctions due to invasive species, this should be clarified.</p> <p>(Maria Rosa Paiva, Universidade Nova de Lisboa)</p>	
16-186	A	5	34			a reference to invasive species, pests, and diseases may be useful to add (Pasha Carruthers, Cook Islands National Environment Service)	Accepted
16-187	A	5	34			competition wont be AFFECTED surely? The balance and the outcome of competition will change. (charles sheppard, university of warwick)	Accepted
16-188	A	5	35	5	35	To add after“anticipated land loss, LOSSES IN INFRASTRUCTURE IN COASTAL ZONE(HOUSES AND BUILDINGS, STREETS AND OTHERS), soil salinization.... (Cristobal Felix Diaz Morejon, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Rejected
16-189	A	5	36			... agriculture, (add) more particularly in regard to low lying coral atolls. (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Accepted
16-190	A	5	41			In many, maybe most, cases, the largest threat is tsunami events and extreme stormes (and hurricanes where those occur). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Noted
16-191	A	5	41			Small Islands (Joeli Veitayaki, University of the South Pacific)	Rejected
16-192	A	5	45	5	46	suggest changing 'adversely affected' to 'vulnerable to' - the ways in which traditional knowledge will be damaged are not so obvious. This would be more consistent wording with discussion towards the end of the chapter (Jonathon Barnett, University of Melbourne)	Rejected
16-193	A	5	46		48	Island Systems Management has been a concept embraced by the OECS Countries in the Caribbean (Christopher Corbin, United Nations Environment Programme Regional Coordinating Unit)	Noted
16-194	A	5	46			the term 'integrated coastal management' used here is correct but later in the chapter (eg p13, line 13) it referes to integrated coastal 'zone' manbagement' - these are different terms and have been debated in the coastal management literature - the more common term today is ICM or integrated coastal management	Will use Integrated coastal management (ICM) consistently.

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						(Nick Harvey, University of Adelaide)	
16-195	A	5	48			it would be more correct to say that ICM has been 'initiated' rather than adopted as in many cases not much has happened (Nick Harvey, University of Adelaide)	Rejected. The philosophy/approach (i.e. ICM) has to be embraced or adopted before being initiated.
16-196	A	5	50			(and elsewhere in this Chapter) COMMENT: The expression "resilience building" is difficult to interpret. Resilience in its original meaning (from the physics) indicates a response of a system, namely its capacity to return to a previous state of "equilibrium", after a perturbation ceased to act. It is not possible to build resilience, it might be possible to manage systems aiming at the enhancement of their resilience. Science has not yet come up with clear directions along this line (e.g. is a more complex system, say a food web with more links, more or less resilient than a simpler one ?) and thus such a task is not straightforward. (Maria Rosa Paiva, Universidade Nova de Lisboa)	Will replace with the term "enhancing resilience".
16-197	A	6	0			No specific section on Recent and Current Trends in Section 16.2 (Christopher Corbin, United Nations Environment Programme Regional Coordinating Unit)	There was a confusion as to whether Chapter 11, WG I was going to do the trends or WG II. The meeting of the Experts in Exeter in September 2005 addressed this confusion. WG I will not address past and current trends. So I will re-insert the trends as per in the ZOD (18-12-05)
16-198	A	6	1		4	Good - important, critical point! (Cheryl Anderson, University of Hawaii Social Science Research Institute)	Noted
16-199	A	6	6	6	8	"adaptation to sustainable development" is an awkward phrase (John Hay, University of Waikato)	Noted and will rephrase the text.
16-200	A	6	6			"Latest scientific information" is not exactly what is says, but rather "the latest information supporting the concept". Observationally based field records by true sea level specialist are ignored, if they contradict the IPCC scenarios. Is this exaptable from a scientific and an ethical point of view? (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Noted the comments. The past and present sea level trends for the Pacific and Caribbean SL trends address this concern. These trends will be inserted in the SOD.
16-201	A	6	7		14	sea-level misspelled and extra period on 14 (Cheryl Anderson, University of Hawaii Social Science Research Institute)	Noted and will be corrected.
16-202	A	6	8			delete "We attempt to present the" text to read "Assessment results are presented ..." (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Noted and accepted the suggested text.
16-203	A	6	9			The 3 time frames chosen are good. The problem, however, is that the middle frame	Noted.

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						will coincide with the next Solar Minimum (Mörner, 2005b). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	
16-204	A	6	12			...independant Small Island countries of archipelagoes (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Noted.
16-205	A	6	13	6	14	The title" Small Islands" does not define the scope of the Chapter accurately. It deals mainly with islands located in tropical /subtropical regions, as stated on page 6, lines 13-14. (Maria Rosa Paiva, Universidade Nova de Lisboa)	This is a major problem for the writing team. During the second LA meeting in Cairns, I raised this point of defining what we meant by small islands. This suggestion was not accepted. A number of reviewers raise the same thing so it is about time the LAs in consultation with the TSU revist the issue of what constitute a 'small islands'
16-206	A	6	14			double full stop. (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Noted and corrected.
16-207	A	6	21	6	29	This section could be shortened if space was at a premium. (Michael James Crabbe, University of Reading)	Noted.
16-208	A	6	21	6	29	Same as the first comment --- should add high coastal index as a "special characteristic" of small islands. (Bruce Potter, Island Resources Foundation)	Noted and acted upon.
16-209	A	6	23		26	Grammar- items listed not parallel---makes sentence longer and more confusing than needed (Cheryl Anderson, University of Hawaii Social Science Research Institute)	Noted and will be acted upon.
16-210	A	6	23	6	45	I am not sure Generally they (Small Island States) host large populations. . .They are growing fast and many are densely population but most small islands states have relatively small population. (Michael Hamnett, Research Corporation of the University of Hawaii)	Noted and will amend the text.
16-211	A	6	24			SIDS don't generally have large aggregate populations - so suggest changing 'host large populations with high' to 'have high population' (Jonathon Barnett, University of Melbourne)	Noted and will amend the text accordingly.
16-212	A	6	24	6	24	I can't see how it is possible to claim that island nations host large populations - in the Pacific, PNG is by far the largest at around 4 million; Fiji ranks next largest, at under 1 million, but most other nations are a tiny fraction of this - indeed, of the major Pacific Island groups, ten have populations of less than 100,000! It is correct to observe that the densities are in some places relatively high and that the population growth rates are amongst the highest in the world. It is also relevant to note that the rates of urbanisation are relatively high - see, for example, Cocklin, C. and Keen, M., 2000, Urbanisation in the Pacific: Environmental Change,	Noted and will amend the text accordingly to reflect the reviewer's comments.

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						Vulnerability and Human Security, Environmental Conservation, 27(4), pp. 392-403. (Chris Cocklin, Monash University)	
16-213	A	6	24	6	24	"large populations" should be qualified (John Hay, University of Waikato)	Agreed.
16-214	A	6	24	6	24	not entirely correct, small islands host dense populations, but very rarely 'large' ones. (David Obura, CORDIO East Africa)	Noted and text will be amended.
16-215	A	6	24	6	24	Many SIDS and small islands in the Caribbean have SMALL populations, and modest growth rates -- almost ALL have HIGH POPULATION DENSITIES, many with high densities since European colonization 400 years ago. (Bruce Potter, Island Resources Foundation)	Noted and will be amended.
16-216	A	6	24			After.....population,add "density" (Sachooda Ragoonaden, Retired)	Agree.
16-217	A	6	26	6	29	Suggest rewriting as: "Most of their economies are small, and vulnerable to external forces, such as changing terms of trade, trade liberalisation, and migration flows." (Jonathon Barnett, University of Melbourne)	Agree and will include this new text.
16-218	A	6	27	6	27	Hay, J.E., Global Change and the Pacific: Roles, Repercussions and Policy Implications for Environment and Development, in Global Change, Environment and Development (Low, P.K., ed), Cambridge (in press) would be an appropriate reference (John Hay, University of Waikato)	Noted and will amend the reference.
16-219	A	6	27	6	29	delete last sentence - its redundant (charles sheppard, university of warwick)	Agree.
16-220	A	6	32	7	17	I think some attention needs to be given to tropical cyclones and rainfall variability both spatially and on annual and seasonal to annual time scales. Some islands rarely get tropical cyclones except during El Nino years (e.g. French Polynesia), while other get fairly frequent cyclones in most years (e.g. Guam). The genesis zones shift over ENSO cycles. Some islands are in almost perpetual drought (in some cases except in El Nino years--e.g. Christmas Island) while others are generally wet (except during El Nino events e.g. Pohnpei). While this level of complexity might add to the length of this chapter, readers need to understand that not all islands are created equal. It may be that long-term climate change is going to accentuate the current patterns or ENSO cycles and the changes from normal that come with ENSO events. (Michael Hamnett, Research Corporation of the University of Hawaii)	Noted and will take insert a new paragraph to reflect this very important issue. Again, trends of tropical cyclones for the Pacific region were included in the ZOD but were removed after discussion during the Second LA meeting in Cairns. As per earlier comment, past and current trends of climate parameters were deleted in the understanding that Chapter 11, WG I will address this. This is not the case after the Expert Meeting in Exeter in September 2005 where it was agreed Chapter 11, WG I will only addresses future trends.

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							WG II regional chapters would have to deal with past and current observed trends. I will take care of this issue in the SOD.
16-221	A	6	32			Section 16.2.2 This section is restricted to climate variability; it should include recent findings regarding climate change in Small Island regions, as well as changes in sea level. With reference to the latter, a key publication is Holgate and Woodworth 2004 Evidence for enhanced coastal sea level rise during the 1990s. Geophysical Research Letters, 31(7), L07305. (John Hay, University of Waikato)	This is an extremely difficult issue to address scientifically. I am not aware of any studies that DIRECTLY ATTRIBUTE human induced climate change in small islands. It is not possible in my view to date to directly attribute to human induced climate change. I would be interested in reviewing this paper. The issue of attribution at the local level is extremely difficult and I personally do not believe human induced climate change is possible to assess in the content of small islands, based on current scientific understanding. For example, it is impossible at this stage to attribute the five tropical cyclones that affected the Cook Islands in February this year to greenhouse gases. There may be a link but we cannot prove it scientifically.
16-222	A	6	34			Any information on eastern Atlantic small islands (e.g. Azores, Cape Verde, San Tome and Principe)? (Sofia Bettencourt, The World Bank)	Will check with experts from this region. This where we need contributing authors.
16-223	A	6	34	7	17	Generally this climate section could be reduced if cutting is needed - the main useful point is about the decadal cycles/systems/oscillations particularly clear for the Pacific. The Atlantic section can be much shorter. (David Obura, CORDIO East Africa)	The section will be expanded to include past and current observed trends.
16-224	A	6	34	6	36	First paragraph rather confusing with regard to climate description. Suggest the following: The climate regime of small islands is quite variable. It is, however, characterised by large seasonal variability in rainfall rather than by small seasonal temperature difference. It is strongly influenced by tropical cyclones and extreme weather events. (Sachooda Ragoonaden, Retired)	Noted.
16-225	A	6	38		39	trade-wind (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Noted.
16-226	A	6	38			?? is there non-tropical Pacific ?? (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Noted.

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16-227	A	6	41	6	41	...dominant mode of YEAR TO YEAR VARIABILITY? (Eileen Shea, East-West Center)	Agree.
16-228	A	6	44			IPO seems closely related to my Super-ENSO events driven by changes in Earth's rotation and interchange of angular momentum (Mörner 1995, GeoJournal, 37: 419-430). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Noted and will review the cited reference.
16-229	A	6	49	7	6	Should we refer to winter and summer in the Caribbean, or rather to dry and wet season. This paragraph could be summarized (June Marie MOW, Fundacion Providence)	Noted and will use the dry and wet to avoid confusion or if summer and winter months terminology is used, will include qualification of what they means in terms of the two atmospheres covered in the assessment.
16-230	A	6	49	6	49	Why speak of gry winter and wet summer in the Caribbean. Just simply state dry season and wet season. (Bhawan Singh, Université de Montréal)	Noted.
16-231	A	7	1	7	1	To add: Atlantic subtropical High(NAH), AND ENSO AND LA NIÑA (Cristobal Felix Diaz Morejon, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Agree.
16-232	A	7	1	7	17	this section lacks supporting references in comparison with the Pacific material on the previous page? Is this because there is a lack of references and a gap in research? (Nick Harvey, University of Adelaide)	Noted and agreed. I will check with the LA on climate matters from the Caribbean, Dr Roger Pulwasty (RP) for more published scientific papers.
16-233	A	7	1	7	1	During the Northern hemisphere winter (Bhawan Singh, Université de Montréal)	Noted.
16-234	A	7	2			Explanations are required for p7 line 2 "strong inversion"? (Claire Hanson, University of East Anglia)	Noted and will do.
16-235	A	7	4	7	4	... in the Northern hemisphere,... (Bhawan Singh, Université de Montréal)	Noted.
16-236	A	7	5	7	5	the southern flank of the NAH becomes convergent with what? (Eileen Shea, East-West Center)	Noted and will check the original contribution from RP (Trinidad and Tobago) who supplied the text.
16-237	A	7	5			I would prefer to say "and the region then comes under the influence of the equatorial trough" rather than suggesting that the southern flank becomes convergent (Adrian Trotman, Caribbean Institute for Meteorology and Hydrology)	Noted and will discuss the matter with RP.
16-238	A	7	8	7	11	Suggest start the para. As follows: The Indian ocean has a unique atmospheric and oceanic circulation as it is the only ocean which is land locked to the north (Sachooda Ragoonaden, Retired)	Agree.

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16-239	A	7	8			After ... Island climates, insert "in the Northern Hemisphere" in the Indian Ocean are dominated (Sachooda Ragoonaden, Retired)	Noted.
16-240	A	7	8			only some island climates in the Indian Ocean are dominated by the Asian monsoon (Thomas SPENCER, Cambridge University)	Noted and text will be amended. However, some LAs of the Chapter suggested otherwise. My own position is the ENSO is the main one that affects all regions.
16-241	A	7	10	7	11	the association between the monsoon and ENSO is not at all clear (Thomas SPENCER, Cambridge University)	Agree and its an area of great interest amongst climate researchers. Would be interested to get some published papers on this topic.
16-242	A	7	11			Add after.....with ENSO events the following:" Islands in the Southern Hemisphere are influenced by the Subtropical High pressure, which in the Southern Hemisphere winter lies further north giving rise to strong trades. In summer, it moves more southwards with a decrease in intensity and a relaxation of the trade over the islands. Suggest also add "A relatively recent climate-related hypothesis on the development of sea-surface temperature (SST) anomalies on the Eastern and Western Equatorial Indian Ocean - The Indian Ocean Dipole (IOD) - could also affect climate in the Indian Ocean. Though it has been argued that IOD is simply an extension of the ENSO influence in the Indian Ocean (Reason, 2000), the relation between IOD and ENSO is still unclear. Some studies (e.g. Saji and Yamagata (2003)) have found that though IOD is not part of the ENSO evolution in the IO, the two phenomena may interact. (Sachooda Ragoonaden, Retired)	Noted and will consider new text in the SOD.
16-243	A	7	11			(contd.) It has been observed that an ENSO event, co-occurring with an IOD event, is much stronger to events that do not co-occur." References:(i)Reason, C.J.C, R.J.Allan, J.A.Lindesay, et al,2000: ENSO and climatic signal across the Indian Ocean Basin in the global context: Part I, interannual composite patterns Int. J. Climatol., 20,1285-1327.(ii)Saji, N.H. and T. Yamagata,2003:Structure of SST and surface wind variability during Indian Ocean Dipole mode events. Journal of Climate, vol.16. 16, pp2735-2751. (Sachooda Ragoonaden, Retired)	Noted and will review the paper cited and draft some text accordingly.
16-244	A	7	15	7	15	"and may go 4-5 months during the summer" to "and experience a prolonged summer drought of 4-5 months" (David Viner, University of East Anglia)	Noted and will amend the text accordingly.
16-245	A	7	16	7	16	Suggest inserting "significant" ahead of "precipitation" (John Hay, University of Waikato)	Will check the actual text from the published papers.
16-246	A	7	20			Other Stresses or elsewhere - should include the lack of insurance/risk-sharing	Good comment but need peer review

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						mechanisms in most small island states - i.e cannot get coastal infrastructure insurance which puts a huge burden on individuals and governments in the case of small islands. Should also look at this under 16.5.4 building resilience through adaptation (Pasha Carruthers, Cook Islands National Environment Service)	literature. Cannot make a statement without references.
16-247	A	7	20			16.2.3: Heavy dependence on coastal resources for subsistence is also a feature of many islands. Extensive use of mangroves is well-understood, but there is little awareness of the importance of freshwater wetlands behind the mangrove forests that are often converted to agroforests on small islands (e.g., Drew et al. in press, Falanruw 1994). These wetlands may be hydrologically contiguous with mangroves, and salinization with sea level rise (Drexler and Ewel 2002) may lead to a very long transitional period when no ecosystem services are provided. (Katherine Ewel, Retired)	Noted. Will check the cited reference.
16-248	A	7	20	8	14	Somewhere in this chapter, some mention should be made of the fact that many island communities have large overseas population, which, in some cases, are much larger than the home population. In some cases remittances from overseas populations exceed that the GDP of the home countries and circular migration is a way of life. This is true in Cook Islands, Niue, and American Samoa. In some cases within countries, populations have out grown what the home island can support (e.g. Kapingamarangi in FSM). (Michael Hamnett, Research Corporation of the University of Hawaii)	Noted but do not agree.
16-249	A	7	20			By far one of the major threats posed to small islands is the problem of invasive species, with most dramatic impacts presently observable e.g. in the Galapagos. However this crucial issue is neither mentioned under 16.2.3., other stresses, nor in the executive summary. (Maria Rosa Paiva, Universidade Nova de Lisboa)	Noted.
16-250	A	7	22	7	35	Overfishing and the impact of increased tourism on coral reef and mangrove degradation should be mentioned here. (Michael James Crabbe, University of Reading)	Accepted. Cover elsewhere.
16-251	A	7	22	8		Section 16.2.3 ... it is also emerging that invasive species and climate change are a potent mix, particularly as native systems become stressed by their climate envelope. Small islands can be particularly vulnerable to invasives due to their depauperate flora/fauna. See IUCN programmes on Invasive species for up to date information. (David Obura, CORDIO East Africa)	Noted but need cited references.
16-252	A	7	23	7	27	Same issues as p.6. Suggest rewriting the one sentence as: "Externally-oriented pressures that create vulnerability of small island states to climate change include	Accepted. Citations Barnett, 2001, Barnett and Adger, 2003.

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						deteriorating terms of trade and in particular rising energy costs, population movements, financial and currency crises, international conflicts, and increasing debt. Internal processes that create vulnerability include rapid population growth, attempts to increase economic growth through exploitation of natural resources such a forests and fisheries and beaches, increasing income inequality, unemployment, rapid urbanisation, political instability, a growing gap between demand for and provision of health care and education services, weakening social capital, and economic stagnation. These external and internal processes are related and combine together in complex ways to heighten the vulnerability of island social and ecological systems to climate change. (Jonathon Barnett, University of Melbourne)	
16-253	A	7	23	7	27	These and other 'external stresses' are discussed at some length in Cocklin (1999) in the context of the Pacific Islands. Vulnerability is characterised there as being a function of external political and economic agendas, the impact of external forces on cultural norms and practices, the imposition of forms of social and economic organisation that differ from those practiced traditionally, and attempts to impose models of adaptation that have been developed for Western economies and without sufficient thought as to their applicability in the Pacific. (Cocklin, C., 1999, Islands in the Midst: Environmental Change, Vulnerability, and Security in the Pacific. In S. Lonergan (ed.), Environmental Change, Adaptation, and Security. Dordrecht: Kluwer Academic Publishers, pp. 141-159). (Chris Cocklin, Monash University)	Noted. Will check the citation.
16-254	A	7	23		27	International Crime (Drug Trade), HIV Aids and youth alienation are three other major stresses in the Caribbean SIDS (Christopher Corbin, United Nations Environment Programme Regional Coordinating Unit)	Noted.
16-255	A	7	25			replace "rising" with "increasing" (Pasha Carruthers, Cook Islands National Environment Service)	Noted. No action taken.
16-256	A	7	26			In some Caribbean territories protein needs met to a large extent by imports (Adrian Trotman, Caribbean Institute for Meteorology and Hydrology)	Comment elsewhere ?
16-257	A	7	27			Start new paragraph at "In Small Islands" (Pasha Carruthers, Cook Islands National Environment Service)	Accepted.
16-258	A	7	30	7	35	See Cocklin and Keen (2000) [ibid] for a review of the impacts of urbanisation in Pacific Island states. (Chris Cocklin, Monash University)	Noted. Will check the citation.
16-259	A	7	32	7	33	Think its acceptable to rewrite as "Concentrations of people in urban areas can create various social, economic and political stresses, and makes people more	Accepted.

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						vulnerable to" (Jonathon Barnett, University of Melbourne)	
16-260	A	7	32	7	32	...to urban services REQUIRED TO MEET basic needs...(instead of "urban services AND basic needs") (Eileen Shea, East-West Center)	Accepted.
16-261	A	7	35	7	36	To add after the final point of paragraph A PART OF THE ISLANDS ARE OF VOLCANIC ORIGIN, THAT INCREASE THEIR VULNERABILITY. A CLEAR EXAMPLE WAS MONSERRAT ISLAND, WHERE THE VOLCANO MADE ERUPTION AND DESTROYED THE MAJORITY OF ISLAND. (Cristobal Felix Diaz Morejon, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Noted. No action taken.
16-262	A	7	43			ref here is good, but why reference this statement and not the dozens of others. Not sure of the referencing pattern here... (charles sheppard, university of warwick)	Noted. Recent reference.
16-263	A	7	46			and rates and magnitudes depend, in this case, on assumptions. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Noted.
16-264	A	7	48	8	1	Gardner may not have mentioned it, but coral disease is responsible for a lot of the loss in coral cover in the Caribbean. It is likely that pollution stress is a factor in that but some of it has probably resulted from micro organisms including viruses, bacteria, and fungi. (Michael Hamnett, Research Corporation of the University of Hawaii)	Noted. Will check the cited reference.
16-265	A	7	49	7	50	Not clear what "coral cover right across reefs in the Caribbean" means? (Bruce Potter, Island Resources Foundation)	Noted. Will check the cited reference for the definition.
16-266	A	7	50	8	1	hence neither climate nor sea level were the forcing function – so why including it? (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Noted.
16-267	A	7		7	29	change serving as to hosting (charles sheppard, university of warwick)	Accepted.
16-268	A	8	0			No specific section on Development and Technology in Section 16.3 (Christopher Corbin, United Nations Environment Programme Regional Coordinating Unit)	Noted. Will check literature on the topic.
16-269	A	8	1	8	3	Is data available on the mangrove area that has been destroyed; this paragrah is about increasing degradation and destruction in recent decades (June Marie MOW, Fundacion Providence)	Noted. Will check literature.
16-270	A	8	2	8	3	removal of mangroves by development is as least as great an issue (charles sheppard, university of warwick)	Accepted.
16-271	A	8	4			Need a sentence at the end of this paragraph that reminds that these processes decrease ecological resilience / heighten vulnerability to climate change	Accepted.

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						(Jonathon Barnett, University of Melbourne)	
16-272	A	8	4			what does 'latter' refer to here. Suggest say it. (charles sheppard, university of warwick)	Accepted.
16-273	A	8	5			<p>Does there need to be a specific paragraph here on hydrometreorological hazards here? I think there needs to be somewhere in this chapter as they are an important stressor and have big impacts on island economies. E.g. cyclone Heta on Niue - the estimated cost of recovering from cyclone Heta in Niue was more than 3 times GDP (Government of Niue, Niue Fooou –A New Niue: Cyclone Heta Recovery Plan (Alofi: Department of Economic, Planning, Development and Statistics, 2004). There are three climate change related issues of concern about hydrometeorological hazards:</p> <p>they seem likely to increase due to climate change, and they are more likely that sea-level rise to have a greater impact on people in the near term.</p> <p>Also, one of the issues with hazards is the time it takes to recover from them. So, it seems to me that in the past it was common for social-ecological systems to recover from hazards as they were sufficiently infrequent and/or less damaging. In the future climate change may create a situation where more intense and/or more frequent extreme events may mean there is less time to recover. Sequential extreme events may mean recover is never completed meaning that there may be long-term deteriorations in affected systems (i.e. agricultural output declines because soils never recover from salinisation, urban water systems deteriorate because storm damage cannot be fixed in time..).</p> <p>Some good data is here: Emily Mackenzie, Biman Prasad and Atu Kaloumaira, Economic Impact of Natural Disasters on Development in the Pacific (Suva, University of the South Pacific, 2005).</p> <p>Another important stressor alluded to here, but for which data can be compiled easily enough, is slow/no rates of improvement in development. Data that would show this include GDP, GDP/capita, and maybe could also look at Human Development as the HDI is a reasonable proxy for adaptive capacity (income, health, and education measures). For example,</p> <p>a) ADB data shows that from 1996-2001 the economies of Federated States of Micronesia, the Solomon Islands, the Marshall Islands, Palau, Vanuatu, and Papua New Guinea contracted. This means less resources for adaptation at the national level, and on average, lower incomes for localised adaptations.</p> <p>b) Comparing the Pacific regional Human Development Reports for 1994 and 1999, the Human Development Index (HDI) declined in seven of the thirteen</p>	Accepted. Will check the citations and insert appropriate text.

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						countries for which there is data, and overall, human development in the region declined between 1994 and 1999. So this suggests that the capacity of individuals to adapt weakened over this time. (Jonathon Barnett, University of Melbourne)	
16-274	A	8	6		14	Discussion of globalization focuses only on negative, and while there are MANY negative issues and side-effects, it could be argued that globalblization also provides access to resources and information. Telecommunications benefits, such as early warnings, for many of the islands experiencing extreme climate events. There is not necessarily an increase in vulnerability and a decrease in resilience and adaptive capacity, but trade-offs that should be evaluated. (Cheryl Anderson, University of Hawaii Social Science Research Institute)	Accepted. Will check the literature and insert appropriate text.
16-275	A	8	6	8	14	A reference to globalisation appears several times in this chapter, without sufficient justification as to why it is a major stress. Some readers may argue that globalisation (especially of labor inputs) may help adaptation by bringing in foreign direct investment and facilitating the migration of labor away from highly vulnerable small islands. The inference should be justified so as to not appear biased. (Sofia Bettencourt, The World Bank)	As above.
16-276	A	8	6	8	14	Broadly, I don't disagree that jaspects of globalisation increase vulnerability/decrease adaptive capacity. However, we have to accept that the converse argument has legitimacy. 'Globalisation' could improve the economic conditions of island states, imparting greater resilience. Modern communication networks improve access to information and the capacity for island states to spread their message. It is by no means one way. (Chris Cocklin, Monash University)	Accepted as above.
16-277	A	8	6		14	Impacts of Globalization as it applies to trade and loss of Protective Markets – Bananas and Sugar in Caribbean SIDS (Christopher Corbin, United Nations Environment Programme Regional Coordinating Unit)	Accepted. See above.
16-278	A	8	6	8	14	There is need to give a least one specific example on how globalization is or will increase the vulnerability of Small Island States (Andrew Githeko, Kenya Medical Research Institute)	Accepted.
16-279	A	8	6			Ist sentence could lead to problems in the sense that this is true also of non-island locations just as much. What is special about small islands here? And last sentence of para, they may also increase resilience and adaptive capacity. This is not a climate change issue really, I suggest.	Noted.

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						(charles sheppard, university of warwick)	
16-280	A	8	6	8	14	Whilst it is not clear from this paragraph why globalisation has decreased the resilience and adaptive capacity of SIS. Are there any references to support this statement, otherwise appears as this is just circumstantial. (David Viner, University of East Anglia)	Noted. Will check the literature.
16-281	A	8	10			I think 'extra-territorial' or 'exogenous' is a better way of saying 'forms of non-territorial'. (Jonathon Barnett, University of Melbourne)	Accepted.
16-282	A	8	11			Maybe 'social forces' rather than 'social organization' (what else is an organization if not social?) (Jonathon Barnett, University of Melbourne)	Accepted.
16-283	A	8	12	8	14	Can we give an example of how globalisation is reducing resilience and adaptive capacity (June Marie MOW, Fundacion Providence)	Noted. See above.
16-284	A	8	13	8	14	Suggest rewriting to be ' , as they may directly influence vulnerability and adaptive capacity'. (Jonathon Barnett, University of Melbourne)	Accepted.
16-285	A	8	13			replace "increase" with "affect" and "reducing" with "altering" as cannot say for sure it will be reduced e.g. communications may result in early warnings and better preparedness (Pasha Carruthers, Cook Islands National Environment Service)	Accepted.
16-286	A	8	17	8	32	This section is titled "current adaptation" but goes on to discuss "proposed adaptation strategies"; what are the "recent studies" that have identified "major areas (sic) of adaptation"? (John Hay, University of Waikato)	Accepted. Will review the literature and redraft new text.
16-287	A	8	20	8	23	This is a valid statement, but a complicating factor on many small islands is the small extent of land area combined with very high population densities, such that retreat may not be an option. (Donald Forbes, Bedford Institute of Oceanography)	Accepted.
16-288	A	8	23			Should this sentence referring to the TAR be here? (Nick Harvey, University of Adelaide)	Accepted.
16-289	A	8	24			Not sure if the statement about financial means of islands of "metropolitan" countries is as significant as something like "coastal islands of continental countries." . . . For example, Turks and Caicos or St. Helena are islands of a metropolitan country, but they certainly have severe financial constraints. (Bruce Potter, Island Resources Foundation)	
16-290	A	8	28			Suggest inserting a reference to traditional coping strategies here, am also	Noted. Need published peer review literature.

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						wondering if the report on how the PNG island community (Tala?) that got flattened by a cyclone and every one thought all would have been killed might be relevant here - because they picked up on natural warning signs and all hid in caves (Pasha Carruthers, Cook Islands National Environment Service)	
16-291	A	8	28			include - "replanting of mangroves" (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Noted.
16-292	A	8	29			while I see the link between energy security and adaptation I think some of the impacts of climate on the energy sector need to be highlighted in the preceding section on current sensitivity for reader clarity about why it is important - perhaps some reference to a study would be good (Pasha Carruthers, Cook Islands National Environment Service)	Noted.
16-293	A	8	30	8	32	Have these strategies shown any signs of success? (Michael James Crabbe, University of Reading)	Noted. Will check the literature.
16-294	A	8	31		32	Other relevant references include the Global International Water Assessment Reports (GIWA) for SIDS Countries and the GEO Reports (Christopher Corbin, United Nations Environment Programme Regional Coordinating Unit)	Note accepted. These are policy documents. No action taken.
16-295	A	8	35			Yes, this is truely assumptions, often "wild" and unfounded, and often contradicting excellent field observational facts. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Noted. No action taken.
16-296	A	8	41		49	Very much modelling and subjective evaluation lie behind this. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Noted.
16-297	A	8	46	9	6	Would these findings translate to the Caribbean? (Michael James Crabbe, University of Reading)	
16-298	A	8	46	8	49	Is there any value to also including the precipitation estimates from Shea (2001), pp 24-25? (Eileen Shea, East-West Center)	Noted. Will check the text.
16-299	A	9	8		20	Model output alwasy stays and falls with the input quality. The max. temperature for the Mediterranean of 2.19, 3.85 and 7.07 seem far beyond expectations. Again we rather meet "maximum frightening" than "bets to our knowledge" approaches. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Noted.
16-300	A	9	8		 Increased surface air temperature and precipitation..... is, with regards to precipitation, in contradiction with line 22,page 3 and lines 13 and 14, page 9 and table 16.2 as the trend in rainfall pattern is still unclear as pointed out many times in the section . To avoid the confusion, a rephrasing is proposed such as ----increased surface air temperature and changes in precipitation regime..... For table 16.2,it is suggested that instead of, for instance, -35.6 -55.1," -35.6 to +55.1" is used to	Accepted. Will revised the text.

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						avoid confusion in the minus sign. (Sachooda Ragoonaden, Retired)	
16-301	A	9	8	9	14	It must be cautioned however, that because of scaling problems, these projections for the most part apply to open ocean surfaces and not land surfaces. So the temperature changes especially may well be higher. (Bhawan Singh, Université de Montréal)	Accepted. Will check the assumptions text from the citation.
16-302	A	9	8	9	9	There is a contradiction between the precipitation projections the text and the projection for precipitations in the different regions shown in the table 16.2. On Table 16.2 the precipitation projections range from negative values to positive ones. (Avelino Suarez, Ecology and Systematic, Cuban Environmental Agency.)	Noted.
16-303	A	9	8	9	14	It is mentioned at the beginning of the paragraph that there is an increase in percipitation expressed in Table 16.2, but the wide range (which was alluded to in lines 13 and 14) could not suggest an increase. Lines 13, 14 seem to contradict lines 8, 9. (Adrian Trotman, Caribbean Institute for Meteorology and Hydrology)	Noted.
16-304	A	9	13	9	13	Suggest changing "range of" to "uncertainty in" (John Hay, University of Waikato)	Accepted.
16-305	A	9	14			include - reference to the "The Island Climate Update" publication - where predictionss provide a better understanding of the climate mechanisms across the Pacific and assists in aggregating baseline data to support the future prediction processes. This is also relevant to para 16.3.3.2 Sea Level rise monitoring and reporting. (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Accepted.
16-306	A	9	17		19	I found tables 16.1 and 16.2 summarising the projected temperature and precipitation changes in the regions concerned very useful. (Claire Hanson, University of East Anglia)	Noted.
16-307	A	9	19	9	20	Table 16.2 it is not clear if the upper limit of the projected precipitation decrease (-) or increase. (Avelino Suarez, Ecology and Systematic, Cuban Environmental Agency.)	Noted.
16-308	A	9	22	9	30	There should be reference to the increasing body of evidence (now over 10 years) here based on projects like the Pacific Sea Level Monitoring project (formerly NTF) and the role this monitoring can play in early warning of both CC induced SLR and other events like tsunami and storm surges (Pasha Carruthers, Cook Islands National Environment Service)	Noted. No action taken. Need published papers.
16-309	A	9	24		30	Include reference to "South Pacific Sea Level & Climate Monitoring Project" (need to source more details to include in the text)	Accepted.

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						(Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	
16-310	A	9	24			especial ?? = special? (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	
16-311	A	9	24			especial' or special? (Nick Harvey, University of Adelaide)	Accepted.
16-312	A	9	24	9	24	..of special... (Bhawan Singh, Université de Montréal)	Accepted.
16-313	A	9	26			of from 1-7 mm' does not make sense and also needs better referencing part from the Pacific - which islands does this 1-7 mm yr relate to and what are the sources of the rates quoted? (Nick Harvey, University of Adelaide)	
16-314	A	9	28	9	30	Text and Figure 16.1: What is the basis for these estimates? ... model(s), scenario(s), climate projection(s)? The original source Shea et al., 2001, is not easily accessible. Is this projection appropriate in the context of conclusions by WG1 in AR4? This example covers only regional trends for the Pacific and adds no information on local factors mentioned in the preceding sentence. I wonder if a more useful presentation might be a table with estimates for individual islands, or perhaps more appropriately regional groups of islands? Or a combination of a global map of SLR from AR4 (if and when available) and a table of representative local trends (vertical motion plus regional SLR) for a subset of small islands. One way or another, I suggest taking a second look at this. (Donald Forbes, Bedford Institute of Oceanography)	Accepted. Will make reference to findings from Chapter 11, WG I, AR4, now available.
16-315	A	9	28			Explanations are required for p9 line 28 island tectonic setting. (Claire Hanson, University of East Anglia)	Accepted.
16-316	A	9	32	9	32	To include in the point of Extreme events the tsunamis, earthquakes and volcanos. (Cristobal Felix Diaz Morejon, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Noted. No action taken. Tsunamis, earthquakes and volcanoes are not covered in this assessment.
16-317	A	9	32			Section 16.3.3.3 This section is a very narrow discussion of "extreme events" and appears to refer only to tropical cyclones; what about extremes in, say, sea level and temperature? (John Hay, University of Waikato)	Noted. Will include findings from Chapter 11, WG1, AR4 (These were not available during the drafting of the FOD).
16-318	A	9	32			Section 16.3.3.3 Key recent references for this section are Emanuel, K. 2005 Increasing destructiveness of tropical cyclones over the past 30 years Nature 436 686-688; P. J. Webster, G. J. Holland, J. A. Curry, H.-R. Chang, 2005 Changes in Tropical Cyclone Number, Duration, and Intensity in a Warming Environment. SCIENCE VOL 309, 1844-1846 (John Hay, University of Waikato)	Accepted. Will check the literature cited here and insert text, if applicable,

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16-319	A	9	32	11	14	Pages 9 – 11, 16.3.3.3. Extreme events COMMENT: The information presented here is generally speculative and even contradictory, namely between the two paragraphs starting on page 10, lines 49-50 and on page 11, line 7. (Maria Rosa Paiva, Universidade Nova de Lisboa)	Noted.
16-320	A	9	34			delete 'from anthropogenic forcing'. This would apply if from anything. (charles sheppard, university of warwick)	Accepted.
16-321	A	9	34			forces (Joeli Veitayaki, University of the South Pacific)	Noted.
16-322	A	9	35	9	35	The distinction between "individual" and organized convection is unclear. Is the term 'individual convection' correct or should it be 'isolated' or 'local' or other? (Donald Forbes, Bedford Institute of Oceanography)	Noted and will check the citation.
16-323	A	9				Explanations are required for p9 which seasons? (Claire Hanson, University of East Anglia)	Accepted.
16-324	A	10	4		41	The max. values in Fig. 16.1 are below the mean value of IPCC (2001) of 47+/-39 mm. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Noted.
16-325	A	10	40			Fig 16.1 which SRES scenarios? Also, the plots represent 2x20 year periods rather than the 3x30 year time slices mentioned earlier in the chapter. (Claire Hanson, University of East Anglia)	Accepted. Will expand further on the assumptions used from the report.
16-326	A	10	49	11	15	See comment no. 2 above regarding trends in tropical cyclone characteristics. (Thomas Giambelluca, University of Hawaii at Manoa)	Noted.
16-327	A	10	49	11	1	A new record for cyclones has been observed this years. This observation is worth noting in this section (Andrew Githeko, Kenya Medical Research Institute)	Noted. No action taken, Require a citation.
16-328	A	10	49		50	If evidence ar lacking, why is it "likely" – (because the authors want it so badly?). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Noted.
16-329	A	10	49	11	15	On TCs literature, it is worth including the work of Emmanuel, 2005 as follows. "Emmanuel(2005) defined an index for the potential destructiveness of hurricanes based on total dissipation of power integrated over the lifetime of the cyclone. This index is a better indication of TC threat than storm frequency or intensity alone. He found that this index increased markedly since the mid-1970 with a near doubling of power dissipation over the period of record. This trend is due to both longer storm lifetimes and greater storm intensities. He found that the record of net hurricane power dissipation is highly correlated with SST and suggests that future warming may lead to an upward trend in tropical cyclone destructive potential and a substantial increase in hurricane-related losses in the 21st century. Ref:	Noted. Will check the paper and draft appropriate text.

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						Emmanuel, K., 2005.. Increasing destructiveness of tropical cyclones over the past 30 years, Nature, 436, 686-688, doi:10.1038/nature 03906, (letter, global, tropical cyclone). (Sachooda Ragoonaden, Retired)	
16-330	A	10	49	11	5	In the discussion of Peterson et al. 2002 (Recent changes in climate extremes in the Caribbean region, Journal of Geophysical Research, vol. 107) it was reported that (quote) "While tropical storms obviously have a direct impact on precipitation indices, in general, the number of tropical storms or intense tropical storms in the Atlantic is only weakly correlated with any of the precipitation indices" Some of the indices expressed rainfall intensities. So there might not necessarily be an increase in rates with increase in storm intensity. I guess more research might be needed here. This sites work done in the 1980s and 1990s. (Adrian Trotman, Caribbean Institute for Meteorology and Hydrology)	Accepted. Excellent suggestion and will incorporate this in the text.
16-331	A	10	50	10	50	...tropical cyclone WIND intensities... (Eileen Shea, East-West Center)	Accepted.
16-332	A	11	1			where does this predicted increase in intensities relate to? (Nick Harvey, University of Adelaide)	Noted. Will check the literature .
16-333	A	11	1		4	Speculations, nothing but speculations. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Noted.
16-334	A	11	1	11	5	Is there evidence that tropical cyclone movement (storm tracks) might shift in the context of climate change? Changes in tropical cyclone tracks are associated with ENSO-related conditions; is this what the authors meant by referring to the "behaviour" of tropical cyclones?; if so, the text could be clarified a bit to make this more clear. (Eileen Shea, East-West Center)	Accepted.
16-335	A	11	2			percent in response to ? Replace "response" with "as a result of" (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Accepted.
16-336	A	11	2	11	4	Re the statement that "the rate of formation is very likely to change ...": Rate in terms of rapidity or frequency? This is unclear. (Donald Forbes, Bedford Institute of Oceanography)	Noted. Will clarify.
16-337	A	11	3	11	5	wondering if any effect on paths taken beyond regions of formation - this section isn't that clear (Pasha Carruthers, Cook Islands National Environment Service)	Noted.
16-338	A	11	5			other factors' may need some spelling out for the Caribbean because it is known that the North Atlantic Oscillation plays a vital role (Giannini et al. 2001 Interdecadal changes in the ENSO teleconnection to the Caribbean region and the North Atlantic Oscillation. Journal of Climate14: 4530-4544). Taylor et al 2002	Accepted.

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						(Influence of the Tropical Atlantic versus the Tropical Pacific on Caribbean rainfall. Journal of Geophysical Research, 107(C9), 3127, doi:10.1029/2001JC001097)reports that interannual variability between May to July (what the authors are calling “early season” in the Caribbean are influenced by the SST of the Atlantic (not ENSO directly) whereas the El Niño/La Niña has a greater influence in the late season August to October. See also Enfield and Alfaro (1999) The dependence of Caribbean Rainfall on the interaction of the tropical Atlantic and Pacific Oceans. Journal of Climate, 12: 2093-2103 (Adrian Trotman, Caribbean Institute for Meteorology and Hydrology)	
16-339	A	11	7	11	15	This is an extremely important conclusion in a paper I would not otherwise have discovered. Should confirm that WG1 AR4 will incorporate these results and seek confirmation from other sources. If true, this conclusion has important implications for other chapters as well. (Donald Forbes, Bedford Institute of Oceanography)	Accepted.
16-340	A	11	7	11	15	In this context, some reference to the number (proportion?) of small islands safe from tropical cyclone impacts ($\pm 5^\circ$ latitude) versus those exposed to impact, perhaps on a regional basis, would be useful. Also, is there any theoretical support and/or observational evidence for possible expansion of the area of tropical cyclone activity? An example is the recently observed tropical cyclone in the Seychelles at approx 4° latitude. (Donald Forbes, Bedford Institute of Oceanography)	Accepted.
16-341	A	11	7			calculations' (Nick Harvey, University of Adelaide)	Accepted.
16-342	A	11	7	11	15	One issue not treated here that I thought had been recently analyzed is that tropical cyclones may be bigger in AREA, and that this impact may be greater than changes in frequency or strength (maximum speed) (Bruce Potter, Island Resources Foundation)	Accepted. Will assess the literature.
16-343	A	11	7			concrete... Is it? It is another estimate, but if you think it is firmer / better you should say so. Given the 2005 hurricanes it doesn't seem to be being more 'concrete'! (charles sheppard, university of warwick)	Noted. Will check the literature.
16-344	A	11	10	11	11	Does the statement indicating that it is "likely that tropical cyclones will last longer in the warmer world and that the number of strong tropical cyclones will increase" need a bit more explanation and/or a reference back to an earlier chapter in AR4? (Eileen Shea, East-West Center)	Noted. Will cross reference to findings of chapter 11, AR4.
16-345	A	11	12			use of tropical cyclones in both hemispheres? See earlier comment no. 5 (Nick Harvey, University of Adelaide)	Noted.

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16-346	A	11	18	11	29	<p>This paragraph doesn't seem to be about a future trends per se. It should be either moved to somewhere else since it is important, or the future direction of traditional knowledge and social capital should be considered more explicitly. In general this discussion of future social trends could be greatly strengthened since there are some important social drivers of vulnerability that need to be considered as well, including the issues mentioned in the existing paragraph, but also, at least: population growth, migration patterns, broad development futures. For example, the phasing out of the Lome agreement and the implementation of the Cotonou agreement will be important. The end of Lome means prices the EU pays for certain agricultural commodities – such as sugar - will decline. Fiji, Jamaica and Mauritius are expected to experience significant contractions in GDP as a result of declining sugar prices paid by the EU (Milner et al 2004). In Fiji, where 25% of the workforce is in the sugar sector, the Cotonou agreement is likely to result in significant unemployment and deeper impoverishment of many of the 23,000 smallholder farmers - many of whom already live below the poverty line (Prasad 2003). So, such declines in the agricultural sector affected by trade liberalisation heighten social vulnerability to climate change.</p> <p>Milner, C., Morgan, W., Zgovu, E. 2004. 'Would all ACP Sugar Exporters Lose from Sugar Liberalisation', The European Journal of Development Research 16(4): 790-808. Prasad, N. 2003. 'Small Islands' Quest for Economic Development', Asia-Pacific Development Journal 10(1): 47-66 (Jonathon Barnett, University of Melbourne)</p>	Accepted.
16-347	A	11	18			<p>16.3.2: The high incidence of suicide of young men who find themselves with no clear place in society has been well documented in Micronesia (Hezel 2001). (Katherine Ewel, Retired)</p>	Noted. Will check the reference.
16-348	A	11	20		28	<p>Very well written. I totally agree. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)</p>	Appreciated
16-349	A	11	20	11	28	<p>again, nothing unique to islands about this. Sure, some of the directions of development mad be limited to islands, but the general impressions given about e.g. traditions, support networks, population growth etc are certainly not. This para is not, therefore, an 'Other relevant consideration'. (charles sheppard, university of warwick)</p>	Noted. Will strengthen this section by examples.
16-350	A	11	21			<p>“Traditional knowledge, practices, and cultures, were strongly based on” and “a subsistence economy was predominant” Is this a deliberate use of the past tense? Perhaps this could be changed to the present tense? Otherwise the reader might be mistakenly led to believe that these practices no longer exist. The following comment suggests that globalisation has affected many traditional practices, but it</p>	Accepted

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						certainly has not transformed all traditional practices. (Donna Green, CISRO)	
16-351	A	11	23			"migration" - also migration from more remote rural in land areas to coastal zones for better access to health services, education, infrastructure, services etc. (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Accepted
16-352	A	11	23			should something be added here to reflect the increasing dependency of island nations on imported goods which create waste management problems (Nick Harvey, University of Adelaide)	Accepted
16-353	A	11	25	11	28	Not only disintegration of traditional communities, but also climate-change impacts on subsistence economies and practices, with additional feedback to social breakdown and loss of traditional values, social cohesion, dignity, and confidence. An example from North America is the impact of reduced sea ice on traditional hunting methods and access to prey for communities in the Arctic. In some cases, as traditional values and practices are lost, the associated loss of purpose and growth of despair among young people is a negative factor for resilience in such communities. Again, this is not restricted to small islands, but is an issue for traditional communities in any region and probably deserves wider consideration in WG2. (Donald Forbes, Bedford Institute of Oceanography)	Accepted. Will contact with this reviewers and others to strengthen the paragraph with wider consideration to islands in the mid- and high-latitudes.
16-354	A	11	26			Grammar: "has" should be "have" (Cheryl Anderson, University of Hawaii Social Science Research Institute)	Accepted
16-355	A	11	27			delete "to adapt" . (Pasha Carruthers, Cook Islands National Environment Service)	Accepted
16-356	A	11	27			The final sentence is unnecessary. (Michael James Crabbe, University of Reading)	Noted. Will change the whole paragraph and treat this comment in this.
16-357	A	11	29	11	30	To add when finish the paragraph THE ACCELERATED DEVELOPMENT OF TOURISM HAS PROVOKED SERIOUS IMPACTS IN COASTAL ZONES OF THE MAJORITY OF THE ISLANDS AND MAKE ITS MORE VULNERABLE. (Cristobal Felix Diaz Morejon, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Rejected. Tourism is dealt with in other part of this chapter.
16-358	A	11	31			Section 16.4 ADB 2005 Climate Proofing: A Risk-based Approach to Adaptation has findings of relevance to many subsections; also applies to Section 16.5 (John Hay, University of Waikato)	Noted
16-359	A	11	31			Section 16.4 may well be improved by looking at Marine fisheries. They are impacts from SST, cyclones. This has a big socio-economic impact. Not only on fish themselves but the fisherfolk and their gear and equipment. (Adrian Trotman, Caribbean Institute for Meteorology and Hydrology)	Accepted

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16-360	A	11	34			This section should be numbered 16.3.4 (John Hay, University of Waikato)	Accepted for Line 18 on page 11.
16-361	A	11	37	11	37	Comment: Any islands have in their territory between hydraulic structure the construction of reservoirs(dams) that accumulate the water in raining season for their utilization in dry season (Cristobal Felix Diaz Morejon, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Noted as a basis for further consideration.
16-362	A	11	37			16.4.1: The term "loss" to describe the flow surface and stream water to the sea without being captured in a catchment is unfortunate, because coastal vegetation and fishing patterns evolved with characteristic rates of mixing of fresh and salt water, as well as velocity of fresh water introduction, however variable. Installation of hydrologic catchments is likely to disturb these patterns, so advocating them may address one problem while exacerbating another. This has been a contentious issue in Hawaii, where many would like to see restoration of the stream flows that were diverted to support commercial agriculture. (Katherine Ewel, Retired)	Noted. Will see the both sides of the problem in the revised text.
16-363	A	11	37	13	14	Is data available on current water scarcity . This section could be summarized (June Marie MOW, Fundacion Providence)	Yes there is data on water scarcity, but I do think we can go into details here, as these could not be directly attribute to climate change per se.
16-364	A	11	37			"Section 16.4. Throughout the section, the authors should divide the descriptions of 'evidence' and 'prediction' clearly in order to improve the readability. For example, in the Section 16.4.1, 2nd para is on 'evidence', 3rd para is on 'prediction', 4th para is on both 'prediction' and 'evidence', 5th para is on 'evidence'... The present content looks confusing, and I think re-organization will be needed." (Hiroya Yamano, National Institute for Environmental Studies)	It is a good point. Clarification would be preferred over re-organisation.
16-365	A	11	39			this is repetitive (Pasha Carruthers, Cook Islands National Environment Service)	Of what....not clear....
16-366	A	11	39	11	43	This creates a conundrum, due to the desire for increased economic growth from tourism to increase capacity for adaptation, while such growth places added (and perhaps unsustainable) demands on an increasingly scarce resource. An important aspect of adaptation in this case then must include measures, physical or otherwise, to reduce water demand and promote conservation. An added factor on some small islands is infrastructure deterioration resulting in major leakage and loss of this scarce resource. (Donald Forbes, Bedford Institute of Oceanography)	This issue of 'leakage and old infrastructure' will be added.
16-367	A	11	42			... more efficient PLANNING AND management ...	This issue of 'leakage and old infrastructure'

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						(Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	will be added.
16-368	A	11	45			a water source used in Pacific Island countries also includes "desalination" - please refer to the "Pacific Dialogue on Water and Climate - Synthesis Report" Chapter 3.3. (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	OK
16-369	A	11	49	12	2	In the case of the Caribbean, consult : West Indian Journal of engineering, 2005 'Rainwater potential for domestic water supply for Carricou and Petite Martinique, grenada, west Indies'. (Bhawan Singh, Université de Montréal)	OK
16-370	A	11	50		 Including Tuvalu, TONGA (rural areas) and (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	OK, but will need a copy of paper as i do not have access to those (RP)
16-371	A	11				This whole para seems to reach general conclusions from this one study, good though it may be. As a lot of new work is being done on hurricanes, I suggest a more fundamental rewrite of this para using other work too. (charles sheppard, university of warwick)	OK
16-372	A	12	0			insert: Similar water loss issues as found in the Seychelles are also currently being experienced in most Caribbean islands (Leo Brewster, Coastal Zone Management Unit, Barbados W.I.)	I will email him for further clarification –on links with hurricanes. (RP)
16-373	A	12	3			in reference to Nauru - formerly reliant on rainwater and GW but now tend to be totally dependent on desalination. Also refer to the "Pacific Dialogue on Water and Climate - Synthesis Report" (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Yes, but this is just but one example.
16-374	A	12	4			this seems an obvious statement without any specifics on the magnitude of these changes - also the reference to 1991 seems a bit old? (Nick Harvey, University of Adelaide)	OK
16-375	A	12	6	12	17	This paragraph could be restructured to shorten it as both references and elements of sentences are duplicated (Pasha Carruthers, Cook Islands National Environment Service)	OK, that end bit of the sentence will be dropped.
16-376	A	12	6			The scenarios analysed aren't always mentioned e.g. 2nd paragraph. Would be useful to go through the text to ensure scenario names are always given. (Claire Hanson, University of East Anglia)	Noted
16-377	A	12	8			By 2050, we will be in a new Solar Minimum with a totally different climatic-eustatic situation (Mörner, 2005b) – in no way considered by IPCC. (Niils-Axel Mörner, Paleogeophysics & Geodynamics)	Noted
16-378	A	12	9	12	11	I'm not sure what report the "East-West Center, 2001" is referencing; given the title, I presume the document is, in fact, the Shea et al (2001) Climate Assessment Report cited elsewhere in the Chapter and shown in the References on page 33,	???

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						lines 17-21. If that is the case, then I don't find the reference to atoll lens thickness on page 27 of the Shea et al (2001) report -- which, I believe, is the only East-West Center Pacific Islands climate assessment report published by the Center that year. NOTE that there is a similar reference to East-West Center 2001 on page 12, line 34 as well. (Eileen Shea, East-West Center)	
16-379	A	12	11			Reference listed incorrectly: "East-West Center, 2001" should be "Shea et al., 2001" - This is one document, not two separate documents, as referenced throughout report and in the reference list. (Cheryl Anderson, University of Hawaii Social Science Research Institute)	Will check....
16-380	A	12	18			than' to 'that'. 'Physically harvested' to 'used'. (charles sheppard, university of warwick)	OK
16-381	A	12	18			that (Joeli Veitayaki, University of the South Pacific)	OK
16-382	A	12	19			delete 1st word 'to' (charles sheppard, university of warwick)	OK
16-383	A	12	20			change end of sentence to read "drought impacts" (Pasha Carruthers, Cook Islands National Environment Service)	OK
16-384	A	12	21			SRES = what ?? (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	OK
16-385	A	12	29			make sure link between ENSO and climate change is clarified earlier (Pasha Carruthers, Cook Islands National Environment Service)	Referred to later in the sentence. SRES acronym will be treated separately.
16-386	A	12	29	12	35	A sentence or two about droughts associated with El Nino events needs to be included in this paragraph. In April and May, 1998, residents of Majuro got seven hours or potable water every fifteen days as a results of the drought induced by the 1997-1998 El Nino (http://lumahai.soest.hawaii.edu/Enso/subdir/update.dir/Update-4thQtr1998/peac.html) (Michael Hamnett, Research Corporation of the University of Hawaii)	Will insert reference from Payet 2005.
16-387	A	12	29			ENSO is mentioned as having a large impact on water supply on small islands but there is no mention of how ENSO might behave in the future. (Claire Hanson, University of East Anglia)	Will insert reference from Payet 2005 on ENSO and climate change.
16-388	A	12	29	12	35	This para does not deal with future impacts, the title of the section - same comment applies to other paras. in this section, which often also discuss adaptation rather than just impacts and vulnerabilities (John Hay, University of Waikato)	Refer to IPCC FAR Chapter 11 WG1. Will also cover small islands.
16-389	A	12	29			Yes, ENSO-events are very important, but they are natural long-term phenomena by no means driven by "global warming".	Stating the obvious – this para is referring to ENSO impacts that have occurred after the

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						(Nils-Axel Mörner, Paleogeophysics & Geodynamics)	TAR and has relevance to climate change (vulnerability and adaptation).
16-390	A	12	29	12	31	might want to clarify that the discussion of water shortages in 1998 in Shea et al, 2001, was actually referring to shortages associated with the 1997-1998 El Nino and subsequent transition to La Nina (not just the 1998-2000 La Nina as described in the text). (Eileen Shea, East-West Center)	Stating the obvious – as above. See chapter 11 of IPPC WG1
16-391	A	12	30			For instance, (Joeli Veitayaki, University of the South Pacific)	OK.
16-392	A	12	32	12	31	The references do not cover the Indian Ocean region (John Hay, University of Waikato)	OK
16-393	A	12	32			Before "In Fidji and Mauritius", add a line as follows: In Mauritius, the summer 1998/1999 was the worst drought ever recorded since observations started almost a century ago(Government of Mauritius). (Sachooda Ragoonaden, Retired)	Indian Ocean Reference will be added.
16-394	A	12	32	12	34	As with comment #20, I'm confused by the reference to East-West Center 2001 (vs. Shea, et al 2001). Also, the Pacific Islands Assessment of the Consequences of Climate Variability and Change for Pacific Islands (Shea et al, 2001) did not address Fiji or Mauritius. Hay et al, 2003, could be the more appropriate citation for this sentence. (Eileen Shea, East-West Center)	Should give entire Reference.
16-395	A	12	34			Reference listed incorrectly: "East-West Center, 2001" should be "Shea et al., 2001" - This is one document, not two separate documents, as referenced throughout report and in the reference list. (Cheryl Anderson, University of Hawaii Social Science Research Institute)	Noted
16-396	A	12	37		44	Are there figures pertaining to the projected demands in water for specific sectors – would be useful here. (Christopher Corbin, United Nations Environment Programme Regional Coordinating Unit)	Noted
16-397	A	12	42			... installed AND MAINTAINED infrastructure ... (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	None as far as peer reviewed papers are concerned; except for one or two countries – grey material/consultancy reports.
16-398	A	12	46	12		suggest moving paragraph to end of this section after p13 lin 14 (Pasha Carruthers, Cook Islands National Environment Service)	OK
16-399	A	12	46			Yes, of course, "access to safe, potable water" is a prime factor for the future of life. The predominant factors, however, are others than the assumed global warming. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	OK

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16-400	A	12	48			percent of what? - the population? (Nick Harvey, University of Adelaide)	Noted
16-401	A	12	49			Grammar - list does not have parallel construction - develop storage, provide treatment, and DISTRIBUTE water (Cheryl Anderson, University of Hawaii Social Science Research Institute)	'of the population'
16-402	A	13	3		14	Reference to GEF Integrated WaterShed and Coastal Management project for Caribbean SIDS which is being replicated in the Pacific and will result in the development on Integrated Water Resources Management Plans; SIDS have also begun to explore projects in rainwater harvesting (Christopher Corbin, United Nations Environment Programme Regional Coordinating Unit)	OK
16-403	A	13	3		14	include that deslination brings no sustainable solutions (energy costs / maintenance etc) (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Not relevant
16-404	A	13	3	13	14	Some mention needs to be made of the value of seasonal to inter-annual rainfall forecasting in adapting to rainfall variability and change. The Pacific ENSO Applications Center and Fiji Met Service have shown that seasonal rainfall forecasting can reduce the need for water storage systems large enough to weather an unanticipated drought--rationing can be much more effective in rainfall can be forecasted. (Michael Hamnett, Research Corporation of the University of Hawaii)	Policy comment – not keen to add this sentence (RP)
16-405	A	13	3			delete 'at great financial cost' (charles sheppard, university of warwick)	Noted for Adaptation section
16-406	A	13	3			Small Island States (Joeli Veitayaki, University of the South Pacific)	OK
16-407	A	13	4	13	14	Could this paragraph be discussed in 16.5 (June Marie MOW, Fundacion Providence)	Noted – need to agree on terminology here, whether we adopt small island states or small islands or SIDS..
16-408	A	13	5			... Tuvalu, KIRIBATI, NAURU, REPUBLIC OF THE MARSHAL ISALNDS (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Noted
16-409	A	13	8			after maintenance "including high fuel costs" (Pasha Carruthers, Cook Islands National Environment Service)	Not applicable, otherwise we will have long lists of islands. Naming of islands should be supported by references...
16-410	A	13	8			... improved RAINWATER harvesting ... (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	OK
16-411	A	13	8	13	14	"This part may be moved to the Section 16.5." (Hiroya Yamano, National Institute for Environmental Studies)	OK

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16-412	A	13	10			change can be to was (charles sheppard, university of warwick)	OK – needs to discuss with (RM)
16-413	A	13	13			replace '. It is anticipated that the index" with ', which' (charles sheppard, university of warwick)	Not clear what is meant by that comment.
16-414	A	13	17	15	4	Thus section can be gratly enriched by referring to the following references for Trinidad and tobago. Obviosly the Lead Author (Agard) can access these at PETROTRIN: SINGH, B and A. EL FOULADI. (2004). Vulnerability Assessment Study for the Relocation of PETROTRIN TRINMAR's Operations Marine Base to the Mont Pellier Estate. Climate Change Institute, Petrotrin, 188 p. SINGH, B and A. EL FOULADI. (2004). Phase 1 Vulnerability Assessment Study for Exploration and Production Development Works in the Oropuche Field. Climate Change Institute, Petrotrin, 94 p. SINGH, B and A. EL FOULADI. (2005). Phase 11 Vulnerability Assessment Study for Exploration and Production Development Works in the Oropuche Field. Climate Change Institute, Petrotrin, 222 p. SINGH, B and A. EL FOULADI. (2005). Phase 1 Vulnerability Assessment Survey for the Pointe-a-Pierre Foreshore Area. Climate Change Institute, Petrotrin,. 118p.SINGH, B. (2002) : Greenhouse gas emissions and constraints to mitigation in the small island states of the Caribbean. Air Pollution X; C.A. Brebbia and J.F. Martin-Duque. Editors. WIT Press, Chapter pp 313-328.SINGH B. and A. El FOULADI (2003). Coastal erosion in Trinidad in the Southern Caribbean: probable causes and solutions. Coastal Engineering 2003 :C.A. Brebbia , D. Almorza and F. Lopez. Editors. WIT Press, Section 6 : 397-406. (Bhawan Singh, Université de Montréal)	OK
16-415	A	13	19	13	24	The only new thing said here is the 1st sentence. That can be phrased as 'The ratio of coast to island area is large, increasing as island size decreases'. The rest of the para shoul db e cut. (charles sheppard, university of warwick)	Will only consider the last two which seem to be peer-reviewed reports - as this is a series of consultancy reports. (JA) will provide PDF copies of these papers.
16-416	A	13	26			Eliminate "it has long been recognised that" (Cheryl Anderson, University of Hawaii Social Science Research Institute)	We believe that this is a true statement and suggests that we are not dealing with something new. In fact it was recognised in the 1991 Assessment.
16-417	A	13	26	13	42	atoll island is described in chapters 6 and 16. Of course, atoll islands are both low-lying coast and small islands and should be discussed in both chapters. However, each chapter does not seem to refer to each other. With the limitation of pages, they	This needs to be raised with Chapter 6. However the references in Chapter 16 deal specifically with atoll islands, rather than

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						should share description and refer to each other. (Hajime Kayanne, University of Tokyo)	coasts in general.,
16-418	A	13	26	13	29	lines 28-29 are badly phrased. Change ' constitutes a dangerous level of climatic change' to 'is dangerous' to threatens to undermine their sovereignty (charles sheppard, university of warwick)	The wording here is quite specific and reflects the phraseology of the references (Barnett and Adger)
16-419	A	13	31	14	14	"Reef islands and carbonate beaches are composed of bioclasts that derived from adjacent coral reefs. This means that coral reefs and islands/beaches are tightly connected. This point should be presented clearly in addition to the role of coral reefs as a natural breakwater as shown in lines 4-14 on page 14." (Hiroya Yamano, National Institute for Environmental Studies)	Agreed, but have yet to find the appropriate place for the insertion
16-420	A	13	31	13	31	"atoll islands ->atoll island geomorphology" (Hiroya Yamano, National Institute for Environmental Studies)	Accepted
16-421	A	13	40	13	42	Is it possible to write why uninhabited islands of the Maldives are morphologically resilient and how this knowledge could support adaptation planning on inhabited islands. This entire paragraph could be summarized (June Marie MOW, Fundacion Providence)	The reasons are given in the reference cited, Kench et al., 2005. We believe that the paragraph cannot be summarized because it contains original research relating to the important question of the future of atoll islands and their purported fragility
16-422	A	13	40	13	42	Page 13, lines 40 - 42, 16.4.2. Coastal systems and resources “.. uninhabited islands of the Maldives are morphologically resilient rather than fragile systems...” COMMENT: 1 - A system might be morphologically resilient and yet “fragile” Example: a beach might be washed away during a medium storm, but after some time the sand is brought back, so it returns to its original form (“morphology” ?) Although the system has showed high resilience, it was fairly easily displaced from its initial state of “equilibrium”. Is it a fragile system? A definition of fragile is needed. 2 - Should this statement be accurate, than it would point to the importance of human activity, and not climate change, as a source of environmental impacts. (Maria Rosa Paiva, Universidade Nova de Lisboa)	The two comments are valid .
16-423	A	13	41			Is ‘uninhabited’ a significant factor in Kench et al’s study? Does it suggest that in the absence of human impacts atolls can adapt? (Jonathon Barnett, University of Melbourne)	Two questions that raise similar issues as the comment immediately above. Human impact on island coasts, mining, harbour construction, groynes etc reduce the effectiveness of ‘natural’ adjustments to extreme events, and climate change and sea-level rise.
16-424	A	13	41		42	Very well. Besides we (Mörner et al. 2004, Mörner 2005b) have shown that the	We are familiar with this reference and the

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						islands and population of the Maldives even survived a +60 cm sea level in the past (full documentation "in prep."). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	critique by Wordworth (2005)
16-425	A	13	47			add text ...and furthermore addressed through new evolving project of the Integrated Water Resources Management which incorporates onshore and land based catchment management in a fully integrated approach. (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	The suggested addition is not appropriate and we would need a specific reference to include it.
16-426	A	14	1			16.4.2: I would expect to see more discussion of impending changes in ocean pH (Caldeira and Wickett 2003). (Katherine Ewel, Retired)	Will include brief comment in paragraph page 14 lines 16 to 22
16-427	A	14	1	15		Figure 6.2. COMMENT: The figure showing major non-climatic change threats to coral reefs, does not include coral predation by the crown of thorns starfish <i>Acanthaster planci</i> (Maria Rosa Paiva, Universidade Nova de Lisboa)	Not included in original Figure
16-428	A	14	4	14	14	Erosion on some atolls is affected significantly by wind patterns associated with El Nino events. On both Tarawa and Funafuti Atolls, strong westerlies have eroded very large areas of islands in both capitals. The sand that is eroded in these cases is lost to the sea and not pushed around to the ocean side of the islets that have been eroded. SOPAC has done several studies on Tarawa. See http://www.sopac.org/tiki/tiki-sopac_download.php?path=/data/virlib/TR/TR0225.pdf&file=TR0225.pdf&loc=TR (Michael Hamnett, Research Corporation of the University of Hawaii)	Accept comment and will add a reference
16-429	A	14	4	14	5	Erosion (and subsequent deposition) shows that coasts are not passive systems (John Hay, University of Waikato)	Not accepted. Refer Bruun Rule
16-430	A	14	4			Erosion needs not to be a sign of sea level rise. It may as well be driven by a sea level fall, or changes in other coastal dynamic parameters. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Agreed and we have listed many other factors line 6 to 10
16-431	A	14	8			The effects of tropical cyclones and long period swell waves generated in the northern hemisphere during the winter period are also major contributors to erosion in the Caribbean. (Leo Brewster, Coastal Zone Management Unit, Barbados W.I.)	Will need to add brief comment
16-432	A	14	10		13	Sentence too long and confusing with improper connections (Cheryl Anderson, University of Hawaii Social Science Research Institute)	Accept. Will reword
16-433	A	14	10	14	14	isn't Sheppard et al.'s study a modelling study? Can one be sure that increased coastal erosion is unambiguously linked to 'decline in reef health'? I remain to be convinced...	No not a model study but based on observations and interpretation.

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						(Thomas SPENCER, Cambridge University)	
16-434	A	14	12			is this two sentences? (Nick Harvey, University of Adelaide)	Will reword
16-435	A	14	14	14	14	To add after the end.....coastal recession, AND SENSIBLE LOSSES IN THE FISHERIES (Cristobal Felix Diaz Morejon, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	The reference deals with coastal recession not fisheries. Need now reference before can add to sentence.
16-436	A	14	18	14	20	I think there is substantial research to support the DECREASED RATE of GROWTH of CORALS, and that this issue should be mentioned MORE than just this ONE phrase. References on this subject NOT included in Chapter 16 include: Bates, N.R., 2002. Seasonal variability of the impact of coral reefs on ocean CO2 and air-sea CO2 exchange. Limnology and Oceanography, 47(1), 43-52. Bates, N.R., Samuels, L., and Merlivat, L., 2001. Biogeochemical and physical factors influencing seawater fCO2 and air-sea CO2 exchange on the Bermuda coral reef. Limnology and Oceanography, 46(4), 833-846. and the Science Article from 1999: Joan A. Kleypas, Robert W. Buddemeier, David Archer, Jean-Pierre Gattuso, Chris Langdon, and Bradley N. Opdyke "Geochemical Consequences of Increased Atmospheric Carbon Dioxide on Coral Reefs," Science 1999 April 2; 284: 118-120. (in Reports) (Bruce Potter, Island Resources Foundation)	Will include when paragraph is revised
16-437	A	14	18			"I question whether global change directly causes increased turbidity and nutrients and chemical pollution." (Hiroya Yamano, National Institute for Environmental Studies)	See previous comment
16-438	A	14	24			to what extent does Fig 6.2 represent threats that are mutually exclusive from climate change? Eg the mass bleaching and sedimentation of reefs could also relate to climate change (Nick Harvey, University of Adelaide)	Agreed, but these 'threats' are present in the absence of climate change
16-439	A	14	24	15	1	Figure 6.2, this matrix should also include a dark shaded box for Tourism impacts on coral reefs in Trinidad and Tobago. (David Viner, University of East Anglia)	We have been faithful to the original figure. For us to modify that figure would require citing specific references. Guidance from Review Editor (and TSU?) required.
16-440	A	15	1			Fig. 6.2: FSM should at least show medium to low level of threat to extreme storm events, because of typhoon frequency affecting Yap especially. Palau should show threats from sedimentation as the new road is completed around Babeldoab. Both these countries are also threatened by coral diseases and bleaching. (Katherine Ewel, Retired)	See previous comment

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16-441	A	15	1			Figure 16.2 - Figure and associated discussion might best be placed in Section 16.2.3 (John Hay, University of Waikato)	Yes we need to consider this.
16-442	A	15	1			Figure 6.2. How are 'high' and 'medium to low' defined? On what basis was this figure devised - a panel of experts? (Thomas SPENCER, Cambridge University)	Need to check original reference. Rolph?
16-443	A	15	5	16		seems to be missing reference to aquaculture/estuarine process. Also effects of runoff (as happens in extreme events) and heat/sun exposure on soil quality (Pasha Carruthers, Cook Islands National Environment Service)	Yes we do need something on aquaculture/estuaries. Could be included on page 16 under fisheries.
16-444	A	15	5	15	16	perhaps shorten this paragraph - focus on relevance to climate change (Pasha Carruthers, Cook Islands National Environment Service)	Agreed
16-445	A	15	5			Section 16.4.3 - Some islands of the Caribbean import most of their food and this brings in another dimension to food security. In such countries food security also involves trade relations, port facilities and the ability of ships to sail. Extreme weather events certainly play a part in the latter two as damage to ports and inability of ships to sail in cyclones can delay access to food. Even internally extreme events can cut off access to food even though temporary. Some of these are tackled in section 16.4.7. Also extreme events in the country from which food is purchased can be a food security issue albeit at times temporary. There may well be some nutrition issues here based on the definition of food security (FAO 1996). See also GECAFS (2005) Science plan and implementation strategy. Earth Systems Science Partnership. Report No 2; 36 pp, Wallingford. (Adrian Trotman, Caribbean Institute for Meteorology and Hydrology)	Yes, but links with climate change not clear
16-446	A	15	5			"Fisheries' may be added in the section heading." (Hiroya Yamano, National Institute for Environmental Studies)	OK, but not in original template
16-447	A	15	7	15	16	A sentence saying something like the following could probably be included: In some cases cash crops are more vulnerable to the impact of tropical cyclones and droughts than traditional subsistence crops. Planting of tree crops like cocoa has provided a good source of foreign exchange and economic growth but it has increased the vulnerability of some Pacific Island economies to extreme climate events. Or, you could skip it because the authors pick this up on the next page. (Michael Hamnett, Research Corporation of the University of Hawaii)	Need a reference . Is this point picked up on page 16?
16-448	A	15	8			(such as sugar, PALM OIL, COPRA / COCONUT OIL, ... (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	OK
16-449	A	15	9	15	11	I do not understand the statement that "the sugar cane industry has provided economic growth [this is fine] and diversification of the economy into tourism and other related industries" - Is this second part correct? Has the sugar cane industry	Will check reference (GOM) and clarify comment.

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						invested in tourism? Is sugar cane now a tourist attractor? The statement is not self-evidently logical. (Donald Forbes, Bedford Institute of Oceanography)	
16-450	A	15	10			There is also significant a significant sugar industry in the Fiji Islands and Papua New Guinea (please make reference) (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Yes and in Barbados etc.
16-451	A	15	10	15	11	Sentence needs revising - how did the sugar industry provide diversification into tourism etc? (John Hay, University of Waikato)	See previous comment (16-449)
16-452	A	15	12			Please add a sentence afterslowly eroding.....as follows: For instance, the European Union is discussing the issue of a decrease in the price of sugar offered to ACP countries by 39% as from 2008. (Sachooda Ragoonaden, Retired)	In light of this and above comments will revise this paragraph
16-453	A	15	13			experienced 'a' decrease (Nick Harvey, University of Adelaide)	OK
16-454	A	15	15			Maybe important to mention that in some Caribbean countries high input costs in the absence of heavy subsidies (as in other larger countries) reducing competitiveness of its agriculture sector. (Adrian Trotman, Caribbean Institute for Meteorology and Hydrology)	See previous comment (16-452)
16-455	A	15	16			Make reference to the impact of subsidies and prices ie where quotas and prices in the Pacific region have been tie to EU agreements. (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	See previous comment (16-452)
16-456	A	15	18	15	23	This might be the place to mention traditional practices of planting diverse cultivars of species to ensure some survive after drought, flood, or high wind events. Declines in multiple cropping and increasing monoculture in agriculture in many Pacific island nations undermines resilience to weather extremes since polycultural systems are better able to sustain yields after extreme events (Campbell, J. (1990). Disasters and development in historical context: tropical cyclone response in the Banks Islands, northern Vanuatu. International journal of mass emergencies and disasters, 8(3), 401-424. ; Clarke, W. C. and Thaman, R. R. (eds.): 1993, Agroforestry in the Pacific Islands: Systems for Sustainability. United Nations University Press, Tokyo; Colding, J., Elmqvist, T. and Olsson, P.: 2003, 'Living with Disturbance: Building Resilience in Social-Ecological Systems, in Berkes, F., Colding, J. and Folke, C. (eds.), Navigating Social-Ecological Systems: Building Resilience for Complexity and Change, Cambridge University Press, Cambridge, 163-185). (Jonathon Barnett, University of Melbourne)	Yes agreed. Need to add.

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16-457	A	15	20	15	23	It is not clear to me what these percentages are a measure of - what is the indicator of 'interdependence with regard to plant genetic resources'? (Chris Cocklin, Monash University)	Needs clarification
16-458	A	15	20	15	23	Is may be my lack of knowledge in this field, but I do not understand the meaning of countries' [plural] interdependence with respect to plant genetic resources, or what the percentage measure refers to. (Donald Forbes, Bedford Institute of Oceanography)	Needs clarification
16-459	A	15	23			"and 37 percent for Vanuatu" (Cheryl Anderson, University of Hawaii Social Science Research Institute)	OK once 16-457, 458 and 16-456 have been actioned.
16-460	A	15	25	15	32	The 1997-98 El Nino caused widespread drought and subsequent food shortages in the islands west of the international dateline: agricultural losses in Fiji were valued at US\$65 million, and some 260,000 people in Papua New Guinea were in a life threatening condition due to depleted food supply (World Meteorological Organization, -The 1997-1998 El Nino Event: A Scientific And Technical Retrospective (Geneva: WMO, 1999) also need to consider compounding food problem of possible reduced access to artisinal and deep water fish. also food security is about ability to purchase food, which means considering: a) changing food prices (if domestic production falls then prices may rise, which won't be helped by rising oil prices), and b) increasing poverty (which may occur through climate change causing contraction and hence job losses and/or lower wages in key sectors like agriculture and tourism, and may occur irrespective of climate change due to forces such as trade liberalisation or economic stagnation). (Jonathon Barnett, University of Melbourne)	Need to revise paragraph in the light of this and comments below
16-461	A	15	25			insert: loss of top soil, and of soil fertility (Leo Brewster, Coastal Zone Management Unit, Barbados W.I.)	See 16-460
16-462	A	15	25		32	This is highly speculative. What's more, it doesn't concider Solar variability – if so, a totally different picture would have emerged (Mörner, 2005b). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	See 16-460
16-463	A	15	25			This paragraph - these issues are being pursued by SIDS in the convention on Desertification, just held in Nairobi in November 2005, against the popular position that 'desertification' is only an issue for contnential/sand/rock type deserts. (David Obura, CORDIO East Africa)	See 16-460
16-464	A	15	27	15	32	This is the source of the confusing statement on the ranges of impacts in the Executive Summary. An additional comment here: It may be important to distinguish between agricultural production for domestic consumption and agriculture for export. Loss of production for the domestic market (and non-market consumption) may result in a need for increased food imports, creating a vicious	See 16-460

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						circle with the need for increased production for export to earn foreign exchange. In addition, social trends such as movement of population to centres of economic activity (e.g. to Tarawa in Kiribati) may lead to an increased dependence on imported foodstuffs (such as Australian rice in this example). (Donald Forbes, Bedford Institute of Oceanography)	
16-465	A	15	27	15	32	These costs are for more than just the agriculture sector - please check (John Hay, University of Waikato)	See 16-460
16-466	A	15	28			the' World Bank (Nick Harvey, University of Adelaide)	See 16-460
16-467	A	15	29			what is meant by 'damage'? - damage to what? (Nick Harvey, University of Adelaide)	See 16-460
16-468	A	15	34	16	2	It is not the shortening of the suagrcane season but the projected temperature increase from climate change. (Bhawan Singh, Université de Montréal)	Will check and include
16-469	A	15	34	16	7	Peterson et al (2002) suggests that the trend in the wider Caribbean basin is that extreme rainfall events (and periods) are increasing. They also report that there is a fairly high correlation between SST and daily precipitation intensity. If this be the case, there could be increased flooding, soil erosion and deposition in the marine environment. What we might be able to say is that if we were to assume the amount of rainfall did not change or even increased, because of increased run-off (not only due to high rainfall events or greater intensity but also due to landuse changes with increasing populations and development) there is likely to be less effective rainfall (less rainfall to recharge aquifers). May need to work more on harvesting rainfall. (Adrian Trotman, Caribbean Institute for Meteorology and Hydrology)	Need full reference to check
16-470	A	16	1	16	7	use of Ste Kitts is inconsistent here with elsewhere in the chapter (Nick Harvey, University of Adelaide)	Agreed
16-471	A	16	2			more clarity needed: what does the doubling CO2 have to do with the growing season? (charles sheppard, university of warwick)	Check, revise or delete
16-472	A	16	6			decline of how much in precipitation? (charles sheppard, university of warwick)	Check, revise or delete
16-473	A	16	9	16	13	In Fiji, for example, Cyclone Ami caused over US\$35 million in lost crops in 2003, and in Niue, Cyclone Heta caused about US\$4 million worth of damages to crops in 2004 (Emily Mackenzie, Biman Prasad and Atu Kaloumaira, Economic Impact of Natural Disasters on Development in the Pacific (Suva, University of the South Pacific, 2005). (Jonathon Barnett, University of Melbourne)	

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16-474	A	16	9	16	9	Suggest changing "freak" to "extreme" or "violent" - also page 17, line 11 (John Hay, University of Waikato)	Accept
16-475	A	16	9			freak storms? You mean 100 yr probability storms, 1000 year prob storms? Be more factual! (charles sheppard, university of warwick)	See previous comment
16-476	A	16	10	16	13	Niue agriculture has also been affected by severe salt aerosol deposition during major cyclones in 1990 and again more recently. (Donald Forbes, Bedford Institute of Oceanography)	Revise paragraph in light of this and earlier comments
16-477	A	16	13			add text ..(.2000). Subsequently in 2004 Niue was subjected to a cyclone where significant damage was caused to the main town centre and coastal areas. (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Revise paragraph in light of this and earlier comments
16-478	A	16	15	16	20	can you get an update to 2005 figures? (Pasha Carruthers, Cook Islands National Environment Service)	Will try
16-479	A	16	15		20	Suggest that the Forum Fisheries Agency (FFA) be researched and stats obtained for the Pacific island countries (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Will follow up
16-480	A	16	15			Surely there are better references for this, for example Kiribati, where fisheries provide up to 50% of GDP?? (David Obura, CORDIO East Africa)	See previous comment
16-481	A	16	15			delet first clause. Same for whole planet! (charles sheppard, university of warwick)	Needs to be said
16-482	A	16	22		29	SOURCE: Hamnett, Michael P. and Cheryl L Anderson, 2000. Impact of ENSO Events on Tuna Fisheries in the US-affiliated Pacific Islands. SOEST Publication 00-03, JIMAR contribution, 00-330, 27pp. Additional reference for the US-affiliated Pacific Islands - This report documents shifts in catch areas, difficulties in landing catches because of changes in ocean currents and thermocline, skipjack decreases and yellowfin increases, changes in size and species composition, changes required by tuna canneries in American Samoa to process catches when size caused changes in decay rates, and loss of transshipment businesses in the Federated States of Micronesia and Guam during the 1997-1998 ENSO warm event. Report includes FAO regional catch data from 1988-1998 (two cold events and three warm events) and transshipment data from 1993-1998. (Cheryl Anderson, University of Hawaii Social Science Research Institute)	This point was covered in detail in the TAR including a specific box in the Coastal and Marine Chapter 6.
16-483	A	16	22			what is meant by 'many'? (Nick Harvey, University of Adelaide)	More than a few
16-484	A	16	23			change "impact" to "climate impacts" (Pasha Carruthers, Cook Islands National Environment Service)	OK

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16-485	A	16	23	16	24	...tuna catches IN THE PACIFIC... Or is there evidence that ENSO affects tuna in other ocean basins as well? (Eileen Shea, East-West Center)	Not just in the Pacific. The paragraph refers to the Maldives
16-486	A	16	24	16	25	lets have some data, preferably figs. This is important enough to need it (charles sheppard, university of warwick)	Figures are in the TAR, Chapter 6.
16-487	A	16	25			and what about th largest event in 1997/98?? (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	See comment 16-478
16-488	A	16	29			Should refer to inshore fisheries as well. (Joeli Veitayaki, University of the South Pacific)	Agreed and subsistence fishery
16-489	A	16	31	16	35	"In addition to pelagic fisheries, the importance of reef fisheries, which support local consumption, could be more stressed." (Hiroya Yamano, National Institute for Environmental Studies)	Agreed.
16-490	A	16	34	16	35	I assume this statement refers to "[The condition of] coral reefs ..." (Donald Forbes, Bedford Institute of Oceanography)	Will rephrase
16-491	A	16	35			add text ...impact on fisheries. There has also been increases in fishing activities for the inland migration to coastal zones in many countries. (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Needs clarification
16-492	A	16	38	17		Biodiversity section needs a cross reference to coastal resources section (coral reefs/fisheries). Also what about insect pest species, invasive plants, mangroves, affects on endemic birds (overall habitat changes), impacts on protected areas, impacts on migratory species that pass through the EEZs of small islands e.g. whales, sea birds. Similarly has there not been research on species shifts and competition in these areas. Potential impacts on eco-tourism? This section seems too forest focused (Pasha Carruthers, Cook Islands National Environment Service)	YES
16-493	A	16	38	17	16	This section refers especially to forest - terrestrial biodiversity; should this section be complemented with marine biodiversity? (June Marie MOW, Fundacion Providence)	Agreed (JA) will provide some additional info from the millennium assessment.
16-494	A	16	38			Section 16.4.4 there is increasing evidence that biodiversity impacts on coral reefs are already being felt, with local loss of vulnerable species and potential fragmentation of species ranges to the point of isolation and eventually extinctions. These provide an analog for the isolation of islands terrestrially, so could provide a powerful symbol for CC impacts on biodiversity. (David Obura, CORDIO East Africa)	Noted, this will need to synch with Chapter 6.
16-495	A	16	38			"Section 16.4.4. According to the contents, I think the section heading should be changed into 'Forest resources.' If the authors could stick to biodiversity, they should describe the effect of global change on marine biodiversity (e.g., coral-reef	This will be addressed to cover other aspects of biodiversity.

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						decline due to bleaching) more." (Hiroya Yamano, National Institute for Environmental Studies)	
16-496	A	16	40		46	May be useful to emphasize the high vulnerability of local and endemic biodiversity to impacts of climate change and invasive species (Christopher Corbin, United Nations Environment Programme Regional Coordinating Unit)	Yes, provided there is referenced material.
16-497	A	16	40		46	the use of fuel wood / biomass in the Pacific islands is far wider than just Samoa and PNG where all PICs are reliant on the use of fuel wood for energy needs in particular cooking. Reference to the biomass resource assessment for PICs will provide details of the volume and use of fuel wood along with the reports from the recent renewable energy assessment carried out under the Pacific Islands Regional Energy Project (PIREP) (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	An example is quote here from available references.
16-498	A	16	46	16	46	To add after ... For cooking purposes, PROVOKING STRONG ENVIRONMENTAL PROBLEMS (Cristobal Felix Diaz Morejon, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	
16-499	A	16	48	16	50	Is there published theoretical and/or empirical evidence to support this statement? Probably needs a reference. (Donald Forbes, Bedford Institute of Oceanography)	Yes, it will be added....the reference is pre-2001 though.
16-500	A	16	48	17	7	This paragraph on tropical montane cloud forests can be bolstered by referencing the paper: Bruijnzeel, L.A. 2000. Hydrology of tropical montane cloud forests: A reassessment. Land Use and Water Resources Research 1(1): 1-19 (available online at http://www.venus.co.uk/luwrr). More emphasis should be given to the hydrological importance of these cloud forests and their role in harboring biodiversity (on most small islands with montane cloud forests, these forests are the only areas where intact native terrestrial ecosystems still exist. (Thomas Giambelluca, University of Hawaii at Manoa)	OK will emphasize.
16-501	A	16				Section 16.4.4 Biodiversity. It would be good in this section to discuss the good and services the ecosystems and the biodiversity brings to the human-well being of the islands populations. The protection of the biodiversity could be an additional value to the tourist product the SIS offers. (Avelino Suarez, Ecology and Systematic, Cuban Environmental Agency.)	Yes agreed.
16-502	A	17	6			Furthermore, (Joeli Veitayaki, University of the South Pacific)	OK
16-503	A	17	9			The assumed "increase in extreme events" is not founded in observations, only in	Noted, the text was referring to the possible

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						models (which even can be read in the TAR-3 report). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	increase in extreme events. Its potential cause or source is not implicit there.
16-504	A	17	9	17	16	The example of devastation of Grenada Spice in Grenada by hurricane Ivan could be introduced here, along with estimated time to regenerate as an example from the Caribbean (Adrian Trotman, Caribbean Institute for Meteorology and Hydrology)	OK but see box on the issue.
16-505	A	17	10			?? "forests are usually slow growing" is this true?? The statement is possibly a little misleading as the reference to Samoa is realated one would assume to coconut plantations not for hard wood species of trees. Therefore suggest that additional information is provided that delineates between broad species as opposed to a sweeping statement. (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Noted will clarify.
16-506	A	17	16			Insert 'Hurricanes also have long term effects on coral reefs, by limiting coral colony recruitment (Crabbe et al., 2002)'. (Michael James Crabbe, University of Reading)	Will consider after consulting paper.
16-507	A	17	21	17	21	To add touristic, and social activities (Cristobal Felix Diaz Morejon, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	OK but see box on the issue.
16-508	A	17	21		22	The capital of the Maldives, Male, is a terrible examples of how a small island is over-loaded. Heavy compation and fracturing are already noted – sliding-off fracturing is a horror scenario. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Noted
16-509	A	17	21			along should be deleted (Joeli Veitayaki, University of the South Pacific)	OK
16-510	A	17	22			The general reference here to both the Pacific and Indian Ocean atolls should be made earlier. (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Comment noted, will see how best to place it.
16-511	A	17	26			Insert after '...lands.' This development is mostly for tourism, and can result in destruction of mangroves and coral reefs.' (Michael James Crabbe, University of Reading)	OK, will see how to add it.
16-512	A	17	29			does 'inward' here mean coastward? (Nick Harvey, University of Adelaide)	Yes, will clarify.
16-513	A	17	31	17	34	(In a sense this could also be a fairly general comment) Here and in other parts of the document it might be important to impress upon readers that the nature of intense cyclones is such that one cyclone can cause major environmental changes (long term in many cases) to coastal regions. It does not necessarily take an increase in frequency and intensity as may accompany climate change (this is not to	Noted, and will take this on board in the text where appropriate.

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						reduce the significance of any potential increases with climate change, rather to show the significant changes possible with one intense storm/extreme event). That may reinforce the need for adaptation through increased resilience and the development of robust systems/policies which can cope with any future climate change and current variability. It is a win-win situation. Maybe easier to buy in than climate change threats by policy and decision makers. (Adrian Trotman, Caribbean Institute for Meteorology and Hydrology)	
16-514	A	17	34	17	34	Suggest to add only one short sentence on the importance of fisheries for the nutritional requirement of island communities (June Marie MOW, Fundacion Providence)	Yes and there are references for this.
16-515	A	17	41	17	44	This paragraph is weak and vague. Should either strengthen or delete. (Donald Forbes, Bedford Institute of Oceanography)	Will strengthen and clarify. Reference also does not refer to IO.
16-516	A	17	41			well-being' (Nick Harvey, University of Adelaide)	OK
16-517	A	17	41		44	The flooding concept has become a popular tool for the demand of economical assistance from developed countries. The people have a much more balanced and observationally based opinion. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Right and in some cases genuine.
16-518	A	17	43	17	44	Replace “...global climate change and sea-level...” with “...global and regional climate change...” (David Viner, University of East Anglia)	No, but regional climate change may be added.
16-519	A	17	46			this para also needs data. (charles sheppard, university of warwick)	Will try to locate some more references. Adger et al. 2004/5
16-520	A	17	48	17	48	Need reference for "second study" (John Hay, University of Waikato)	Yes, awaiting a redraft of this para from contributing author.
16-521	A	17	50			these "other studies" should be cited here (Simn Hales, University of Otago)	Ditto
16-522	A	18	3	18	13	An analysis of reportable disease statistics in Fiji conducted by the Fiji School of Medicine, the University of Hawaii and the East-West Center found that major dengue fever outbreaks occurred during dry periods (many associated with ENSO events) in which a heavy rainfall event occurred such as tropical cyclones Susan which struck Fiji in January 1998. Understanding patterns like this will allow public health officials to initiate dengue prevention programs based on rainfall forecasts from the Fiji Met Service. (Michael Hamnett, Research Corporation of the University of Hawaii)	Ditto
16-523	A	18	3	18	13	This paragraph could be summarized and merged with the last paragraph of this section	Noted

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						(June Marie MOW, Fundacion Providence)	
16-524	A	18	3	18	13	ditto. There is far too much assertion for a document like this. Present the facts. Disease increase / spread is contentious. Vague statements like this will be ignored and will dilute the message. (charles sheppard, university of warwick)	Noted and will be tackled.
16-525	A	18	7	18	10	There is an internal contradiction in this section. First it is stated that in the "warmer" dryer years there was greater occurrence of dengue. Its is then stated that "there was no evidence of the impacts of tempeature increases. One would assume that "warmer" means higher temperatures which was associated with more dengue. Its is worth noting that in the dry years dengue in the Caribbean is likely to increase because of water storage in drums. The AIACC SIS 06 project reported that a moving average temperature index was a good indicator for the potential dengue occurrence (Andrew Githeko, Kenya Medical Research Institute)	Yes, the issue will be addressed when the entire para is redrafted.
16-526	A	18	9			drier' (Nick Harvey, University of Adelaide)	OK
16-527	A	18	9	18	13	A study by Depradine and Lovell (2004, Climatological variables and the incidence of Dengue fever in Barbados, International Journal of Environmental Health Research 14(6), 429 – 441) for Barbados showed that of the meteorological parameters, highest correlations were found with dengue fever and vapour pressure at a lag of 6 weeks. There was a weaker correlation with precipitation with a lag of 7 weeks. From this study a predictive model explained 35 % of the variance suggesting a much greater role of non-meteorological factors. (Adrian Trotman, Caribbean Institute for Meteorology and Hydrology)	Will obtain paper...
16-528	A	18	15	18	18	This sentence is illogical beginning with 'While'. Omit this word and break sentence after "dengue fever". Introduce Ciguatera poisoning in a new sentence. (Donald Forbes, Bedford Institute of Oceanography)	OK
16-529	A	18	15	18	18	Revise sentence - "while" seems redundant (John Hay, University of Waikato)	OK
16-530	A	18	18			replace "reefal" with "lagoon" unless reefal is an accepted term - have never heard it used before (Pasha Carruthers, Cook Islands National Environment Service)	OK, but the term is used.
16-531	A	18	18			contribute to c outbreaks ?? "c" (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	OK
16-532	A	18	18	18	21	More general review of ciguatera epidemiology appropriate here, including evidence that multiple factors are important (Simm Hales, University of Otago)	OK

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16-533	A	18	18			c' needs removing (Nick Harvey, University of Adelaide)	OK
16-534	A	18	18			the letter "C" is superfluous (Sachooda Ragoonaden, Retired)	OK
16-535	A	18	18	18	18	...contribute to outbreaks... (Bhawan Singh, Université de Montréal)	OK
16-536	A	18	22	18	32	This entire chapter talks about sea level rise as if the water in the bath tub is rising and that the water staying higher will cause the problems. In places, it acknowledges the fact that sea level rise will be a particular problem during storm surge events. Sea level rise will mostly be a problem and cause damage during extreme events including storm surge events. But most of the damage from sea level rise will occur during extreme tides and during ENSO events where increases in sea level exceed the projected long-term increase in sea level resulting from global warming by several orders of magnitude. So, episodic inundation and erosion will be a problem and fresh water lenses will probably get compromised during storm events or extreme tides as well. The authors may know all of this, but dealing with the impacts will likely be either a disaster response or disaster prevention effort (or disaster mitigation in disaster management terms. (Michael Hamnett, Research Corporation of the University of Hawaii)	Noted, and will relook at the entire chapter to see how this perception may be addressed. On the issue of SLR being considered a disaster is not entirely agreed...when one considers the definition of a disaster, similar the disaster will recur at every high tide – twice a day for most places !!!
16-537	A	18	24	18	24	Suggest to discuss socio-cultural impacts separately. I think it is important; maybe we should think about some positive impacts, as was mentioned previously, since some island people are returning to their old style/old fashioned "best practices" (June Marie MOW, Fundacion Providence)	Noted – some local people returning back to 'old' practices' may not be a positive impact psychologically – whilst the rest of the world is moving forward...islanders will see themselves moving backwards !!!!!
16-538	A	18	24			"Section 16.4.6. Cultural issues should be described, or 'cultural' should be removed in the section heading.' (Hiroya Yamano, National Institute for Environmental Studies)	OK, will clarify.
16-539	A	18	26	18	33	Indebtedness, low growth rates etc. are factors that warrant mention here. In Cocklin (1999) trade imbalances, the rates of economic growth relative to population growth, the vulnerability of export commodities and markets, and narrow economic bases are also referred to (Cocklin, C., 1999, Islands in the Midst: Environmental Change, Vulnerability, and Security in the Pacific. In S. Lonergan (ed.), Environmental Change, Adaptation, and Security. Dordrecht: Kluwer Academic Publishers, pp. 141-159. (Chris Cocklin, Monash University)	OK
16-540	A	18	26	18	49	In summary these three paragraphs could do with a major re-write. There are a few omissions, points missed and the odd selling mistake. One issue that is overlooked	OK, will seek the references from the reviewer.

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						<p>is the threat to the Tourism Industry of SIS as a result of increasing competition from other locations. Amelung and Viner (2003) indicated that improving climate conditions for tourism may occur in other regions which as a result may impact upon the flow of tourists from developed (North) countries, this has been examined by Mather and Viner 2005.</p> <p>Viner D. and Amelung B. 2003 Climate change, the Environment and Tourism: The Inter-actions. Proceedings of the ESF-LESC Workshop, Milan 4-6th June Publ. eCLAT, Climatic Research Unit, Norwich, UK 2003. 63pp</p> <p>Mather S. and Viner D. 2005 Climate and Policy Changes: Their Implications for International Tourism Flows. In: Tourism, Recreation and Climate Change, Eds Hall M. and Higham J. Publ. Channel View Publications 309pp.</p> <p>(David Viner, University of East Anglia)</p>	
16-541	A	18	28	18	30	<p>A reference for this sentence is important. Brautigam, D. and Woolcock, M.: 2001. Small States in a Global Economy. World Institute for Development Economics Research Discussion Paper 2001/37, Helsinki.</p> <p>(Jonathon Barnett, University of Melbourne)</p>	A suitable reference will be added.
16-542	A	18	30			<p>The Torres Strait Islands (between Cape York, Australia and PNG) have not been mentioned in this chapter thus far. Several of these islands are low lying, with social and economically disadvantaged indigenous communities living on them. Socio-cultural impacts on their traditional lifestyles from changing diets (reduced consumption of traditional foods such and increased consumption of fast food) have already negatively affected their health. Climate impacts that reduce access to traditional food and change growing seasons are likely to further worsen these health impacts.</p> <p>Ref Beadle, R 2005 What's for dinner on Thursday? The impacts of supermarkets in the Torres Strait Islands (SAGES: Research Paper No 23)</p> <p>(Donna Green, CISRO)</p>	Noted but need a citable reference.
16-543	A	18	31	18	32	<p>The sentence referring to conflicts whilst relevant for tourism does not appear relevant for climate change impacts. Can the reduction be quantified, are the supporting references?</p> <p>(David Viner, University of East Anglia)</p>	Agreed. Sentence will be deleted.
16-544	A	18	32	18	33	<p>Can the numbers of deaths and the economic and insured losses be quantified. Also the number of deaths compared to other natural disasters (and previous hurricanes, e.g., Mitch, 1997) was not that large as a result of better warning systems.</p> <p>(David Viner, University of East Anglia)</p>	Noted. Will seek a reference.
16-545	A	18	33			<p>100 percent of' seems superfluous - better to say 'often exceeding the country's</p>	Agreed.

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						GDP' (Nick Harvey, University of Adelaide)	
16-546	A	18	35	18	40	again, this has been subject to much study. Cite some specific examples, or synthesise it but don't just say vague and sweeping statements. (charles sheppard, university of warwick)	Noted. References will be added.
16-547	A	18	36			After.....is increasing..... add one sentence as follows: In Mauritius in view of the decrease in the price of export sugar to the EU and decrease in textile export, the Government of Mauritius is focussing its efforts on the development and strengthening of the tourism industry to create employment to absorb part of the loss labour in the sugar and textile sectors to avoid social unrest.. (Sachooda Ragoonaden, Retired)	Need a citable reference before this reference can be included.
16-548	A	18	36	18	37	The sentence starting "Since their economies...". Should be replaced by "Climate change will impact on the range of attributes and resource demands of the tourism industry and will have significant effects, both directly and indirectly, on the economies of tourism dependent islands (Agnew and Viner, 2001), (Simpson et al., 2005). Agnew M. and Viner D. 2001 Potential impacts of climate change on international tourism. Int. J. Tourism and Hospitality Res. Vol 3. 37-61. Simpson, M., Ladle, R., Viner, D. and Nicholls, S. (2005) The Impacts of Climate Change on Tourism in Tobago. Annalen der Meteorologie 41 Vol. 2, 17th International Congress of Biometeorology ICB 2005, Deutscher Wetterdienst, Offenbach am Main, Germany (David Viner, University of East Anglia)	Noted. Auyhor will examine references.
16-549	A	18	38	18	40	The sentence starting " Sea level rise and" can be concluded with the reference Uyarra et al, 2005 Uyarra M.C., Cote I.M., Gill J.A., Tinch R., Viner D. and Watkinson A.R. 2005 Island-specific preferences of tourists for environmental features: implications for managing the impacts of climate change on Caribbean tourism Environmental Conservation 32 11-19 (David Viner, University of East Anglia)	Noted. Authors will revise sentence construction.
16-550	A	18	40	18	43	Is there published literature to support the statement about reductions in the demand for travel to small islands? Note, also, that this paragraph needs reworking in terms of the style and grammar. (Donald Forbes, Bedford Institute of Oceanography)	Noted. A reference will be added.
16-551	A	18	40	18	43	As discussed in Shea et al (2001) and other reports, water shortages would also	Noted.

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						have a direct impact on tourism which is a water-intensive industry in addition to the indirect impacts associated with real or perceived disease threats. (Eileen Shea, East-West Center)	
16-552	A	18	41			"warmer" instead of "wormer" (Cheryl Anderson, University of Hawaii Social Science Research Institute)	Noted. Spelling will be corrected.
16-553	A	18	41			wormer or warmer ?? (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Noted.
16-554	A	18	41		, while warmerinstead of "wormer" climate (Sachooda Ragoonaden, Retired)	Noted.
16-555	A	18	41	18	42	Afternorthern countries..... add " which will benefit rich countries at the expense of Small Islands will also reduce (Sachooda Ragoonaden, Retired)	Noted.
16-556	A	18	41	18	41	...while warmer..... (Bhawan Singh, Université de Montréal)	Noted.
16-557	A	18	41	18	41	Spelling replace "wormer" with "warmer"! (David Viner, University of East Anglia)	Noted.
16-558	A	18	42			insert "potentially" before "reduce number of people" as can't predict for sure, also correct "wormer" (Pasha Carruthers, Cook Islands National Environment Service)	Noted.
16-559	A	18	43		44	Last sentence is redundant. Can be cut. (Cheryl Anderson, University of Hawaii Social Science Research Institute)	Agreed.
16-560	A	18	43	18	43	...rise have... (Bhawan Singh, Université de Montréal)	Noted.
16-561	A	18	46	18	47	Suitable reference for this first sentence Becken S., 2004 Becken S. 2004, Climate Change and Tourism: Adaptation and Mitigation in Fiji, Landcare Reseach, Christchurch, New Zealand. 71 pp (David Viner, University of East Anglia)	Noted. A suitable reference will be added.
16-562	A	18	47	18	49	This is why trade liberalisation and governance programmes may be disadvantageous – in theory they make economies more economically competitive, but in climate change adaptation terms more competitive doesn't mean less social or ecological vulnerability. (Jonathon Barnett, University of Melbourne)	Noted.
16-563	A	18	48			This is not clear to to me - also are there any studies to reference? (Pasha Carruthers, Cook Islands National Environment Service)	Sentence will be rewritten and reference added.
16-564	A	18	48	18	49	What are "import competing businesses"? I think I know, but it would be helpful to spell out the meaning more explicitly. Also the meaning and role of "large resource	See previous comment.

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						rents" is not clear. The statements in this paragraph also require support from published literature. (Donald Forbes, Bedford Institute of Oceanography)	
16-565	A	19	2	19	2	Should infrastructure be understood as harbours, ports and airports only, or are water supply, sewage and waste management included. The entire section could be summarized (June Marie MOW, Fundacion Providence)	Infrastructure refers only to built development such as ports. Water supply, sewage and waste management can be added to line 10 as dependent services.
16-566	A	19	8			list seems truncated - need an "and" (Pasha Carruthers, Cook Islands National Environment Service)	Accepted.
16-567	A	19	12	19	13	This sentence is technically incorrect in the phrase "... and on tiny coral islands." Shouldn't the 'and' be 'or'? And the reference to "tiny coral islands" is a little odd. Perhaps it would be more useful to rephrase this to say "... is sited very close or immediately adjacent to the shore and at very low elevation." (Donald Forbes, Bedford Institute of Oceanography)	Sentence will be revised along the lines suggested.
16-568	A	19	12	19	14	...islands of the Indian and Pacific Oceans and the Caribbean... (Bhawan Singh, Université de Montréal)	Agreed.
16-569	A	19	14		16	Since 1950, global sea level shows virtually no rise. Hence the stated 3.5 mm/yr rise must, if real, represent local subsidence/compaction problems. Lesson: Don't generalize exceptions (line 18-20). (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Disagree. See IPCC Working Group 1 Report.
16-570	A	19	22		32	Include in formation on Niue (2004) event and the Cook Islands (2005) event.(Cyclones). For Niue damage was assessed to be in the order of \$NZ38M where the population of 1300 was effected equates to \$NZ 29,200 per person against a GDP per capita of \$NZ 7,500. The Island of Rarotonga within the Cook Islands group was subjected to five cyclones within a month that impacted on two (2) islands in the northern group the estimated cost of damage to these two outer islands was in the order of NZ\$1.8 M (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Paul, please supply references to support these statements.
16-571	A	19	23	19	26	Sea-level rise was not required for overtopping and severe damage to infrastructure during cyclones in Niue. I have published on 1990 Ofa impacts in late 90s. SOPAC may have published results on more recent cyclone impacts. The important point is that the common practice of siting critical infrastructure close to the coast (e.g. fuel storage as identified in Niue prior to damage by recent cyclone) increases hazard not only associated with sea-level rise but also to independent cyclone or tsunami impacts. (Donald Forbes, Bedford Institute of Oceanography)	Donald, please supply references for consideration.
16-572	A	19	28			"The cost should be standardized, e.g., cost/GDP, as described in Box 16.1."	Noted.

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						(Hiroya Yamano, National Institute for Environmental Studies)	
16-573	A	19	32			New data on Katarina and Rita are wanted here. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	References are being sought.
16-574	A	19	35	20	8	The box on impacts of Ivan on Grenada omits the damage to the yachting industry and the future probability that INSURANCE COMPANIES will no longer insure yachts in Grenada during hurricane season, thus destroying a profitable nascent industry. (Probably this was omitted by the OECS report cited also, but it shows important problems of vulnerability to outside socio-economic forces related to climate change.) (Bruce Potter, Island Resources Foundation)	Bruce, we need a reference before we can consider including this information.
16-575	A	19	42	44		use of million and billion EC\$ probably needs to be consistent with use of US\$ terminology (Nick Harvey, University of Adelaide)	Will consider adding US\$ equivalent in brackets.
16-576	A	19	43	19	45	There must be an error in the numbers here. If \$1,381million is 38% of GDP, \$288 million cannot be 29% of GDP. (Donald Forbes, Bedford Institute of Oceanography)	Thank you for pointing this out. We will consider whether there is an appropriate way to correct the apparent error in the source document.
16-577	A	20	0	25		much repetition of concepts and ideas already stated (charles sheppard, university of warwick)	Noted.
16-578	A	20	2	20	3	I don't understand the use of the term 'sub-sector' here. Does this refer to something like the 'eco-tourism' sub-sector of the 'tourism sector'? (Donald Forbes, Bedford Institute of Oceanography)	Yes, the reference is to the 'eco-tourism' sub-sector of the 'tourism sector'.
16-579	A	20	7	20	7	OECS,2004 does not appear in References (Bhawan Singh, Université de Montréal)	OECS, 2004 will be added to References.
16-580	A	20	11	20	40	would be good to have reference to studies on costs of response versus preparedness (avoided damage) also perhaps case study example could be something like ADB CLIMAP project which looked at flood susceptibility in the Cook Islands and "climate proofing" infrastructure in Micronesia (Pasha Carruthers, Cook Islands National Environment Service)	Agreed. We need appropriate references on costs.
16-581	A	20	11			16.5. Adaptation: practices , options and constraints “.. the overall vulnerability of small island states is primarily a function of four interrelated factors “ COMMENT: Judging from the text of the present document, the relative importance, or relevance, of the four factors mentioned would appear to be inverted: 4 -> 3-> 2-> 1 (Maria Rosa Paiva, Universidade Nova de Lisboa)	An interesting observation. We feel that uncertainty does not dominate the present document

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16-582	A	20	14	20	14	...ongoing CHANGES IN CLIMATE...OR ...ongoing CLIMATE VARIABILITY, climate change and sea level rise...(vs. "ongoing climate change and sea level rise"). (Eileen Shea, East-West Center)	Accept 'changes in climate'
16-583	A	20	24	20	38	The model of malaria in relation to GDP referred to here is extremely naïve. There is a complex two way relationship between GDP and malaria, (eg, Sachs and Malaney) The causation may be in the reverse direction to that assumed by the authors. Countries stay poor, (GDPpc below \$300) because malaria cannot be eliminated. Climate change will make elimination of malaria more difficult, relative to a unchanged future climate, even if GDP rises. (Simm Hales, University of Otago)	Is this comment in the correct place?
16-584	A	20	29	20	32	Again note the parallels with the Arctic and other regions. (Donald Forbes, Bedford Institute of Oceanography)	Noted
16-585	A	20	32			Insert ' There should be put in place mechanisms to enable sharing of best practice among small islands for dealing with climate change.' (Michael James Crabbe, University of Reading)	This is a recommendation. We need to rephrase comment in IPCC acceptable terms.
16-586	A	20	34	20	38	Donors also provide perverse incentives by rushing in with disaster reconstruction efforts, but investing little in prevention and climate-proofing of investments (see Bettencourt et al 2005, provided with this review). (Sofia Bettencourt, The World Bank)	Should include
16-587	A	20	41			"Section 16.5.1. For severely degraded coral reefs, restoration would be needed to improve the potential for tourism resources and supply of island/beach-forming materials (bioclasts). Recent advances in spawning control techniques, larvae nursery techniques and transplanting techniques of corals (e.g., Hayashibara et al., 2004, Coral Reefs, 23, 406-409; Okubo et al., 2005, Coral Reefs, 24, 333-342; Omori, Coral Reefs, in press) may be referred to." (Hiroya Yamano, National Institute for Environmental Studies)	Need to check with cross-chapter references to coral adaptation.
16-588	A	20	50			separted is probably the wrong term - perhaps say ' will be able to be differentiated' (Nick Harvey, University of Adelaide)	Accepted 'will be differentiated'
16-589	A	20	50			able to be is out of line (Joeli Veitayaki, University of the South Pacific)	Agreed see previous comment
16-590	A	20				need to be consistent with Small Island States (Joeli Veitayaki, University of the South Pacific)	Chapter is on small islands
16-591	A	21	3	21	6	The point about corals adapting by hosting more temperature tolerant algae is a good point, but the biodiversity of algae species that can tolerate higher temperature water is relatively small and the adaptivity of those species to other changes may not be as good as others. This came out of presentations at an EPA/NOAA	Add after "tolerant algae" the number of algal species that can tolerant high SST may be limited.

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						workshop held in Hawaii in June 2003. But, I am sure it can be found elsewhere. (Michael Hamnett, Research Corporation of the University of Hawaii)	
16-592	A	21	4	21	6	This sentence gives the wrong impression. The authors should mention the destructive influence of bleaching on coral reefs, and the point that corals would react too slowly to the climate changes predicted. (Michael James Crabbe, University of Reading)	Yes, we replace with reefs.
16-593	A	21	4	21	5	Is this a biodiversity issue that needs to be discussed (June Marie MOW, Fundacion Providence)	
16-594	A	21	5	21	6	Logic issue in the sentence "They can also grow upwards with the rise in sea level, providing vertical accommodation space is available." The rise in sea level surely provides the accommodation space, making the conditional clause unnecessary. (Donald Forbes, Bedford Institute of Oceanography)	Accepted
16-595	A	21	5	21	6	The statement that corals can grow up to cope with sea level rise should be modified by the possibility that growth rates may be reduced from more acid marine environments etc. (Bruce Potter, Island Resources Foundation)	Need specific references to acidification and coral growth
16-596	A	21	5		7	Instead of "providing" in lines 5 and 7, it should be "provided". (Sachooda Ragoonaden, Retired)	Accept
16-597	A	21	11	21	14	Imperative that a reference support this statement (John Hay, University of Waikato)	Bernett(2001)
16-598	A	21	11	21	17	Which is the concept of natural adaptation of ecosystems ? As I understood from the text the best for SIS is to develop because, because the wealth it confers enhance the resilience. The ecosystems will naturally adapt to the new conditions. It would be good to show a case example. Unfortunately the SIS natural and human-use systems currently faced pressures that are not only from climatic origin and the natural adaptation on them many times would not be possible. It is necessary to integrate into the development strategy of the islands different actions to increase the ecosystem resilience to adapt to the current and future impacts. (Avelino Suarez, Ecology and Systematic, Cuban Environmental Agency.)	We think that concept here does not require redrafting text
16-599	A	21	15	21	17	Is there an example; this statement is not convincing, may be rather contradictory (June Marie MOW, Fundacion Providence)	No example cited in the literature
16-600	A	21	18			This discussion suggests some clear implications for adaptation. Sustainable human development that meets people's needs without undermining natural and social capital is required. This requires, for example: good development planning; further development of services like finance and eco-tourism; further development of migration and remittance transfers as might be facilitated by regional working migrant schemes; and international transfers to assist with adaptation	Noted

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						(Jonathon Barnett, University of Melbourne)	
16-601	A	21	36	21	36	To add after.... For adaptation action, AND NECESSITY OF FINANCIAL RESOURCES (Cristobal Felix Diaz Morejon, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Accept and add after adaptation action “and financial resources to support such action”
16-602	A	21	36			add text - ... for adaptation action. HOWEVER MANY OTHER PICS COMPRISE OF CORAL ATOLLS OR LOW ISLANDS AS PART OF THEIR COMPOSITION. (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Yes, but no action required
16-603	A	21	36	28	43	In this section one of the major areas of research that is required are further studies of the impacts of climate change on tourism in small islands states. Tourism is a major industry in many SIS and is often used as a catalyst for promoting economic development of others. For instance in the aftermath of Hurricane Ivan, Grenada is undergoing a period of rapid expansion of its tourism sector to replace revenue lost by the destruction of its agricultural industry. This is a pathway that Tobago followed after destruction caused by Hurricane Flora in 1963. Similarly there are no studies as yet that examine the impact of the adaptive capacity of SIS if the flows of tourists from developed countries is reduced as a result of the unfavourable impacts of climate change on the tourism industry of SISs (David Viner, University of East Anglia)	Discussed earlier in text 1) The example of Granada is interesting one, given the review’s comments on Mauritius See comment 16-409, 450, 451 2) We agree
16-604	A	21	40			In 2000 and repeated in 2001, I told the Government of the Maldives that their greatest problem was not sea level rise but the effects of tsunamis and extreme storms. In December 2004, I unfortunately was right. All this talk about a hypothetical sea level rise fools the people to turn away from the real threats; in this case tsunamis and storms. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	A comment no response required
16-605	A	21	42	21	45	There is a punctuation or wording problem in two sentences--before and after Generally. (Michael Hamnett, Research Corporation of the University of Hawaii)	Will clarify and reword
16-606	A	21	42	21	42	...suggestion. Generally... (Bhawan Singh, Université de Montréal)	See previous comment
16-607	A	21	45	21	45	...(See Box 16.3). (Bhawan Singh, Université de Montréal)	See previous comment
16-608	A	21	47	21	49	It would be best to make some suggestions, such as reuse of water for toilets, and other uses	Too specific in this context

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						(June Marie MOW, Fundacion Providence)	
16-609	A	22	0			There has been no mention made to impacts on energy, for example (low lakes / river flows due to a lack of rainfall impacting on hydropower - ie PNG, Fiji, Samoa. Diesel costs if hydropower generation is not available. Damage to powerlines / distribution systems / poles / transformers. Biomass loss of trees / energy sources (coconuts). Consideration should also be given to the cost impacts of rebuilding / relocating as may be the case. (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Good point about energy. In fact energy has mentioned in several National Communications including Malta.
16-610	A	22	0			Suggest the inclusion of a Pacific Box (examples could include Niue, Cook Islands, Samoa, Fiji) (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	No, Box 16.3 deal with the Pacific
16-611	A	22	1	22	1	Is there a widely accepted definition of the "Least Developed States"? This term is introduced here for the first time without elaboration. Can a more general terminology be used? (Donald Forbes, Bedford Institute of Oceanography)	Yes, UN defined and list them
16-612	A	22	2			Adaptive measures should include reef regeneration programmes, such as those being tried out on the North coast of Jamaica. (Michael James Crabbe, University of Reading)	Agreed. Need guidance on which subsection might be most appropriate. 16.4 or 16.5
16-613	A	22	12	22	12	Table 16.2 This is not a very good example and includes a series of errors and mistakes for example is it really possible to defend the islands of the Maldives from sea-level rise without severely impacting upon the other attributes (i.e. coral reefs, beaches, unspoilt nature) that are important for the tourism industry. A suitable replacement for this table can be found in See Table 24, Page 56 of Becken S., 2004 Becken S. 2004, Climate Change and Tourism: Adaptation and Mitigation in Fiji, Landcare Reseach, Christchurch, New Zealand. 71 pp (David Viner, University of East Anglia)	Agreed. However this is that the Maldivian Government sees adaptive majors.
16-614	A	23	0			Consideration give nto the inclusion of information relating to the Pacific Tool - Comprehensive Hazard and Risk Management (CHARM) (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Noted
16-615	A	23	3			Box 16.3 this is important as it provides a practical process to move from studies to adaptation implementation that is less complex than the IPCC vulnerability and adaptation assessment guidelines (Pasha Carruthers, Cook Islands National Environment Service)	Noted
16-616	A	23	26	23	34	The model of malaria in relation to GDP referred to here is extremely naïve. There is a complex two way relationship between GDP and malaria, (eg, Sachs and	Comment on wrong chapter

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						Malaney) The causation may be in the reverse direction to that assumed by the authors. Countries stay poor, (GDPpc below \$300) because malaria cannot be eliminated. Climate change will make elimination of malaria more difficult, relative to a unchanged future climate, even if GDP rises. (Simm Hales, University of Otago)	
16-617	A	23	38	23	40	I prefer to think of human resources being "insufficient" rather than "inadequate" - also line 42 (John Hay, University of Waikato)	Yes, changed
16-618	A	23	42			Human resources is partly because of brain drain. People aren't less capable, nor even is it necessarily the case that educational services are inadequate, the problem has a lot to do with migration of skilled workers to higher-wage countries. Much depends on how much they remit. See: Voigt-Graf, C. 2003. 'Fijian Teachers on the Move: Causes, Implications and Policies', Asia Pacific Viewpoint 44(2): 163-175. Mckee, D and Tisdell, C. 1988. 'The Developmental Implications of Migration from and Between Small Island Nations', International Migration 26(4): 417-426. (Jonathon Barnett, University of Melbourne)	Will include some references
16-619	A	24	5	24	5	Floods affect not only Suai but all western highlands. Remove reference to Suai. (Sofia Bettencourt, The World Bank)	This was specified in a reference.
16-620	A	24	7		8	"renewable energy" - need to elaborate HOW can reduce the risk of future damage??? (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	No. We identified the issue eg. human health issue not the solution
16-621	A	24	10			add text - ...positive opportunities", as is the case for most other Pacific island countries. (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Reference is specific to Timor Leste
16-622	A	24	13			16.5.4: Except for mention of remittances in section 16.5.4, I see nothing about the implications of changes in migration patterns to and from islands, especially those closely associated with developed countries (e.g., FSM, Niue) (Katherine Ewel, Retired)	This issue should be included. Need solid references on migration.
16-623	A	24	13	26	6	Section 16.5.4 - this goes out on a new limb, emphasizing the importance of adaptation in enabling resilience and dealing with CC in a more organic sense than just 'planning adaptation'. I think this is important. The point could be strengthened, and I don't know if this is possible in this context, by relating adaptation to two things. One is the need for diversity - of projects, ideas, trials - out of which the best survivors will emerge to 'replicate' under new climatic/social/national conditions. The second is the need for flexibility in the system to enable these to emerge - so the dynamic partnerships/integration between communities, companies, government, civil society. This does seem implicit in Box 16.4 and the conclusions	Will add diversity and flexibility.

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						drawn in this section, but might be more explicitly stated as strong advice for developing adaptation programmes for the future. (David Obura, CORDIO East Africa)	
16-624	A	24	13			16.5.4. Building resilience through adaptation COMMENT: Resilience is here used yet with another meaning: the ability of human populations to continue living on the islands. (Maria Rosa Paiva, Universidade Nova de Lisboa)	Yes
16-625	A	24	18		19	... help moderate economic risk. ??how?? It has also been cited that the use of permanent materials to build house in many PICs has made the more vulnerable and less resilient to extreme events where the former use of traditional materials enable houses to be repaired / rebuild using natural materials and independent from other specialised materials. (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	1) These are the points words of Pelling and Uitto (2001) . Refer the paper for details. 2) Agreed
16-626	A	24	25			add text - Consider that there is the need to establish an increased understanding of the processes and options to adapt and mitigate through education processes. (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Will add some comments.
16-627	A	24	27		33	SIDS are beginning to consider single markets and economies as evidenced by the CSME in the Caribbean (Christopher Corbin, United Nations Environment Programme Regional Coordinating Unit)	Need formal references, and add after "international tourism"
16-628	A	24	31	24	33	Increased integration into world economy could also lead to more multilateral agreements for fishing rights in the EEZ, which are recommended as an adaptation option to mitigate against the effects of multi-year fluctuations in tuna stocks (see World Bank 2000). (Sofia Bettencourt, The World Bank)	Need specific references
16-629	A	24	31			being to be deleted (Joeli Veitayaki, University of the South Pacific)	Accept
16-630	A	24	35		38	Lots of interrelated variables all on a hypothetical level. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Noted
16-631	A	24	41			Not just 'social science' perspective but also a 'climate policy' perspective as this is one measure of 'dangerous climate change' as referred to Art 2 of the UNFCCC. (Jonathon Barnett, University of Melbourne)	Will delete "form a social science perspective" and make a general comment
16-632	A	24	42			replace "undermine" with "erode or inundate" (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	"undermine" is used in a reference
16-633	A	25	22		28	Increased rainfall might also be associated with increased incidences and levels of pollution run-off? Has there been any evidence of this in Caribbean SIDS? (Christopher Corbin, United Nations Environment Programme Regional	Noted

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						Coordinating Unit)	
16-634	A	25	27	25	28	Sentence is unclear. Needs to be rewritten (Bhawan Singh, Université de Montréal)	Will rewrite the sentence
16-635	A	25	33			reference for this example? (Nick Harvey, University of Adelaide)	Yes, the reference is Sinha and Bushell
16-636	A	25	40		41	"several areas are outlined"...Reference is specifically for the Caribbean, but list also applies to Pacific and probably most island settings. These things were discussed in Shea et al 2001 and in Shea and Subbiah, 2004 (Full reference is: Shea, Eileen and A.R. Subbiah, 2004. Symposium on Climate and Extreme Events in Asia Pacific: Enhancing Resilience and Improving Decision Making. Honolulu: East-West Center publication. (Cheryl Anderson, University of Hawaii Social Science Research Institute)	Accept
16-637	A	25	40	25	40	...a number of areas ARE outlined...WHERE? If this is strictly from Field (2003), then I'd put the citation up at the beginning of the paragraph. There are, however, other reports that discuss integration of risk management and adaptation for island communities as well so perhaps this opening sentence should read 'in a number of recent reports' or something similar. Appropriately recognizing a possible personal bias here, one example of another discussion of climate risk management is Shea, Eileen L. March 2003. "Living with a Climate in Transition: Pacific Communities Plan for Today and Tomorrow." Asia-Pacific Issues, No. 66. Honolulu: East-West Center. I also suspect that Sutherland et al 2005 might be another relevant reference in this context as well as any other reports from the CIDA-funded community-based adaptation project in the Pacific coordinated by SPREP (including the work summarized in the Sutherland et al report). If the authors haven't already done so, they might want to double-check the status of the SPREP final report on the CIDA-funded community-based adaptation project. (Eileen Shea, East-West Center)	Accept
16-638	A	25	44	25	46	Risk insurance will not be applicable as long as donors continue to play a substitute role, rushing in with donations when disasters strike. Under this scenario, small island governments have little incentives to reduce moral hazards and invest in disaster insurance (see page 30, Bettencourt et al (2005). (Sofia Bettencourt, The World Bank)	Noted
16-639	A	25	45	25	45	Risk management and insurance are two different "tools", if you wish. Please explain how they are linked and how they can be relevant for adaptation. Perhaps rephrase to "could include insurance". (Laurens Bouwer, Institute for Environmental Studies, Vrije Universiteit)	Accept the last sentences
16-640	A	26	1	26	6	It is not clear that small island populations have the greatest impacts from climate	Accept, but use different wording

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						change compared to countries like Bangladesh or other highly climate-vulnerable countries. I would suggest modifying the sentence as "the greatest impacts of climate change are likely to be faced by the poorest amongst small island populations, who also have a low capacity to deal with, or adapt, to such impacts, as they are forced to live in naturally vulnerable areas". (Sofia Bettencourt, The World Bank)	
16-641	A	26	6			add text ... small island populations THAT ARE GENERALY SMALL, have a low ... (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Reject. See the comments
16-642	A	26	9			Headings: the reduced-form headings are followed. There is no Section 16.6 on Case Studies. However, there are a number of boxes which could become Case Studies if the WGII Co-Chairs wish the reduced-form headings to be followed exactly. Again, it would be a golden opportunity to include some high-latitude and non-autonomous Small Islands in the Case studies, and use Contributing Authors to write these. (Jean Palutikof, Hadley Centre)	Can review provide examples?
16-643	A	26	13			With all that has been said, can this statement be stronger - 'these linkages are especially relevant' (David Obura, CORDIO East Africa)	Briguglio: The existing text is better
16-644	A	26	16		45	This section is long and redundant of many items already discussed. If concerned about page numbers, section could be shortened. Also, in the Pacific, Shea et. al. 2001 also looks at sustainable development. (Cheryl Anderson, University of Hawaii Social Science Research Institute)	Briguglio: I do not agree
16-645	A	26	16			replace "however" with "also" (Pasha Carruthers, Cook Islands National Environment Service)	Briguglio: accepted
16-646	A	26	16	26	20	"This paragraph may be moved to Section 16.4." (Hiroya Yamano, National Institute for Environmental Studies)	Briguglio: I do not agree
16-647	A	26	19			a previous quote on Maldives fisheries contribution was only 10% of GDP (David Obura, CORDIO East Africa)	Briguglio: The previous reference [16.22] was to islands in general
16-648	A	26	20	26	20	To add after...GDP. A VERY CLEAR EXAMPLE WAS THE TSUNAMI EFFECTS IN INDIAN OCEAN IN 2005 (Cristobal Felix Diaz Morejon, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Briguglio: accepted
16-649	A	26	22	26	27	"Solutions of Ronneberg (2004) looks important, but they are not presented at all. It could be presented in a Box." (Hiroya Yamano, National Institute for Environmental Studies)	Briguglio: I am not sure whether Lead Authors would like to include a box with examples. If yes I will prepare a box. Ronneberg mentions four examples

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16-650	A	26	24			the acronym SIDS is introduced here, and I've been looking for it all along. It should be introduced right at the beginning. (David Obura, CORDIO East Africa)	Briguglio: The acronym SIDS is explained in the text
16-651	A	26	25			It will be beneficial to policy-makers if a summary of the "innovative solutions" be included in bullets form or in a box (Sachooda Ragoonaden, Retired)	Briguglio: I am not sure whether Lead Authors would like to include a box with examples. If yes I will prepare a box. Ronneberg mentions four examples
16-652	A	26	25	26	25	...Ronneberg (2004)... (Bhawan Singh, Université de Montréal)	Briguglio: accepted
16-653	A	26	27	26	27	SIDS : define (Bhawan Singh, Université de Montréal)	Briguglio: The acronym SIDS is explained in the text
16-654	A	26	29	26	32	"This paragraph may be moved to Section 16.4." (Hiroya Yamano, National Institute for Environmental Studies)	Briguglio: I do not agree
16-655	A	26	34	26	45	To be effective, adaptation needs to be integrated with national economic planning, and these plans need to be directly tied into national budgets. Stand-alone plans (even if sustainable development plans) are unlikely to be effective. (Sofia Bettencourt, The World Bank)	Briguglio: This is a very useful comment, but it is not cited in the literature
16-656	A	26	37		37	In addition to Sustainable Development Strategies, also include Poverty Reduction Strategies (Christopher Corbin, United Nations Environment Programme Regional Coordinating Unit)	Briguglio: This is a very useful comment, but it is not cited in the literature
16-657	A	26	47			The mitigation measures mentioned in the text are those oriented to a reduction of greenhouse gasses in the atmosphere? Is this the paragraph sense?. Which mitigation actions could be relevant for the SISs' sustainable development plans and actions? (Avelino Suarez, Ecology and Systematic, Cuban Environmental Agency.)	Briguglio: The text says that mitigation in SIS per se will not have an effect on climate change, but it will have a major moral and ethical message
16-658	A	27	0			On page 27 Cyprus, a Mediterranean island is mentioned, but islands located in temperate/ cold regions, which experience different types of problems, are not addressed. Up to which size should an island be considered as "small"? An indication of an upper area limit would be useful. (Maria Rosa Paiva, Universidade Nova de Lisboa)	Briguglio: This is a very useful comment, but I think it is not "politically" wise to enter into the issue of a cut-off point regarding size
16-659	A	27	3			add to end of sentence something to effect of "and increased potential to cope with climate impacts on fuel delivery through self sufficiency (Pasha Carruthers, Cook Islands National Environment Service)	Briguglio: no need to insert this
16-660	A	27	19		33	Would it be useful to highlight the several efforts of SIDS in the area of renewable energies here?	

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						(Christopher Corbin, United Nations Environment Programme Regional Coordinating Unit)	
16-661	A	27	20	27	22	The point in this sentence is a bit obtuse - e.g., what are practical egs of the 'indivisibilities involved in adaptation measures'? (Chris Cocklin, Monash University)	Briguglio: The term "indivisibilities" is well understood in economics. I have added a brief explanation
16-662	A	27	20	27	22	Small editorial point. The two especially phrases in the same sentence make it awkward. (Michael Hamnett, Research Corporation of the University of Hawaii)	Briguglio: accepted
16-663	A	27	21	27	22	It is not clear what is meant by "the indivisibilities involved in adaptation measures ..." (Donald Forbes, Bedford Institute of Oceanography)	Briguglio: The term "indivisibilities" is well understood in economics. I have added a brief explanation
16-664	A	27	25			... used FOR agriculture .. and VILLAGE OR COMMUNITY sttlement purposes. (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Briguglio: Settement purpose is already mentioned in the text
16-665	A	27	28	27	30	Decisions in small islands will not have any meaningful influence on the rate and magnitude of climate change and would be significant only in a moral sense. (Donald Forbes, Bedford Institute of Oceanography)	Accept but no action required
16-666	A	27	36			"Some of the items presented in Section 16.7 Key uncertainty... (especially those in 2. Impacts and Adaptation section) seem to appear suddenly to me. A short paragraph to summarize the current knowledge and problem may be needed for each section, in order to improve the readability." (Hiroya Yamano, National Institute for Environmental Studies)	Accept and will include an introductory chapter
16-667	A	27	41	28	5	An item that should be added to the Observation and Climate Change Science list is the development of methods to account and document the impacts of extreme events that are occurring now. Natural disaster risk and vulnerability assessment can lay out the risks from tropical cyclones, droughts, coastal erosion, and threats islands now face and provide a much richer understanding of impacts than quantitative models which are often not grounded in empirical reality. If indeed, climate change impacts are going to be heavily manifested through changes in rainfall and tropical cyclone patterns, getting a much finer grained understanding of the impact of extreme climate events and seasonal to interannual climate variability. (Michael Hamnett, Research Corporation of the University of Hawaii)	Accept and noted
16-668	A	27	43	27	46	...to detect the sign of an early warning AND TO PROVIDE INFORMATION TO SUPPORT ADAPTATION. It's important to recognize that continued observations of both climate-related events and impacts are important not just for detecting climate change but for buiding reslience today as well.	Accept and will make the sentence more reflective of the comment

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						(Eileen Shea, East-West Center)	
16-669	A	27	45	27	46	Observation is not required "to detect the sign of an early warning" as this has already been detected (see preceding sentence). However, it may be useful to suggest that ongoing observation is required to monitor the rate and magnitude of changes and impacts. (Donald Forbes, Bedford Institute of Oceanography)	Accept and change as appropriate
16-670	A	27	45			observation of impacts is important but should this just 'be continued' or is there a real need to conduct new monitoring programs to identify climate change impacts? In many islands identification of coastal impacts for example rely either on very old comprehensive island surveys or to modern surveys focused only on areas of human impact such as causeways, protective walls etc (Nick Harvey, University of Adelaide)	Accept for observations "be continued" but will need references that support need for new monitoring programmes
16-671	A	27	46			to detect "early warning signs." (Cheryl Anderson, University of Hawaii Social Science Research Institute)	See comment in 46 above
16-672	A	27	46			insert after Therefore, ..."generate and test networks and systems for ...observation of impacts" after sign should be pluralised to "signs" (Pasha Carruthers, Cook Islands National Environment Service)	Accept
16-673	A	27	46			Many thanks. I agree, but in the Maldives the stopped our investigations just because we got the "wrong" answer – sea level is not rapidly rising and is not the main threat to the islands. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Noted
16-674	A	27	48	28	1	These gaps are particularly accute for Indian Ocean states, as Pacific Islands are in the process of developing SIMCLIM to permit more detailed modelling at the island level. Contact Prof. John Hay for more information. (Sofia Bettencourt, The World Bank)	Noted. SIMCLIM is not yet available to PICs for island level modelling
16-675	A	27	49			Climate models, maybe. But what about observations and Solar cycles – they seriously contradict (or rather invalidate) the models. (Nils-Axel Mörner, Paleogeophysics & Geodynamics)	Noted – not appropriate here
16-676	A	27	50	28	1	Is this a call for improved regional climate models? (Donald Forbes, Bedford Institute of Oceanography)	Yes, will make the text more specific for improved regional climate models
16-677	A	28	0	28		To include early warning systems in Impacts and Adaptation (Cristobal Felix Diaz Morejon, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Noted, no action
16-678	A	28	1			... Small Islands DEVELOPED FROM RELIABLE BASELINE DATA AND INFORMATION. (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	
16-679	A	28	3	28	4	"Supporting efforts by Small Islands AND METROPOLITAN COUNTRIES to	Accept and we will add to text as appropriate

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						arrest the decline of observational networks and expand observational networks should be continued." In the Pacific, at least, in addition national efforts to support climate observation systems within Island Countries, it's also important to recognize the importance of regional efforts through which large, metropolitan countries are helping to support the improvement of climate observing systems in small island countries (e.g., the Pacific Islands GCOS (PI-GCOS) program). More generally, the issue of restoring, enhancing and sustaining climate observing systems is an extremely important point and the bulleted recommendations here (and elsewhere in the Chapter) would be strengthened, I believe, by citations to GCOS regional plans where they exist (e.g., the PI-GCOS Action Plan which can be obtained through SPREP or the PI-GCOS website). (Eileen Shea, East-West Center)	
16-680	A	28	5			Modelling of the effects of climate change on coral reefs and mangroves are needed. (Michael James Crabbe, University of Reading)	Modelling will cover all factors where necessary and relevant for Small islands
16-681	A	28	6			Impacts and adaptation - future work should look further at critical thresholds (Pasha Carruthers, Cook Islands National Environment Service)	Accept and include in text
16-682	A	28	6			Also participatory approaches to merging 'top down & bottom up' concepts in V&A (Pasha Carruthers, Cook Islands National Environment Service)	Accept and include in text
16-683	A	28	6			Also examination of how isolation/energy security issues due to transport/access can be addressed through increased through increased self sufficiency/energy conservation (Pasha Carruthers, Cook Islands National Environment Service)	Noted
16-684	A	28	6	28	31	Island governments could focus efforts on more effective adaptation to current patterns of climate variability and change and extreme events. This should be highlighted in the Impacts and Adaptation section. If island societies could harden their infrastructure and adapt their potable water and agricultural management systems to reduce the impacts of droughts and tropical cyclones, they would be more resilient in the face of long term climate change than they are now. Where possible, deeper coastal setbacks, more wind resistant buildings and infrastructure, and water storage systems that can weather droughts islands now face; and more fishing industries, water mangement agencies, agricltural extension systems, and public health programs that can take advantage of seasonal to interannual climate forecasting would make islands much more able to cope with long term climate change. (Michael Hamnett, Research Corporation of the University of Hawaii)	Accept and include in text
16-685	A	28	10			replace "for" with "that will provide a" complete assessment etc ..	Accept to replace "for with "that will provide

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						(Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	a”
16-686	A	28	16			further exploration of early warning mechanisms - rapid vulnerability assessments to determine urgent needs of small islands (Pasha Carruthers, Cook Islands National Environment Service)	Noted, no action
16-687	A	28	19		20	"equity and institutional analyses related to climate change, and adaptation and mitigation in Small Islands" (Cheryl Anderson, University of Hawaii Social Science Research Institute)	Accept
16-688	A	28	27		31	This bullet should specifically mention climate risk management, which is really the "integrated approach" recommended in this bullet. For example: "Therefore, integrated approaches toward sustainable development in which multiple stresses and enhancement of resilience are taken into consideration and framed as climate risk management should be pursued." (Cheryl Anderson, University of Hawaii Social Science Research Institute)	Accept
16-689	A	28	27	28	31	insert eco-system degradation after limited carrying capacity and resources (Pasha Carruthers, Cook Islands National Environment Service)	Yes, will include ecosystem degradation
16-690	A	28	27			COMMENT: As recognized here, most of the problems focused in this chapter are general issues of great relevance for small islands, but which result from pressures other than climate change (Maria Rosa Paiva, Universidade Nova de Lisboa)	Noted but no actions required
16-691	A	28	33			Mitigation - would like to see reference to implications of different SRES scenarios for small islands - dangerous levels, alternative pathways, thresholds (Pasha Carruthers, Cook Islands National Environment Service)	See WGIII Report and Chapter 2 of WGII report
16-692	A	28	33	43		In this section a further bullet point can be added. Investigation of the barriers to the adoption of renewable energy systems in SIS. and examination of the potential impacts of such systems. (David Viner, University of East Anglia)	Noted
16-693	A	28	37			Add "including renewable energy sources and energy-saving policies". (Sachooda Ragoonaden, Retired)	Accept
16-694	A	28	42	28	42	Here again, is the meaning of CDM widely known? (Donald Forbes, Bedford Institute of Oceanography)	Provide CDM in full – clean development mechanism
16-695	A	28	44			Include Planning / Design - ie do not build in coastal zones, in particular low lying areas, provide alternate water supply options and protect the water (and other relevant) resources properly. (Paul Fairbairn, South Pacific Applied Geoscience Commission (SOPAC))	Accept
16-696	A	29	1			References Another relevant reference is W. Neil Adger, Terry P. Hughes, Carl Folke, Stephen R. Carpenter, Johan Rockstrom, 2005 Social-Ecological Resilience	Accept and will obtain the reference

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						to Coastal Disasters. Science, 309, 1036-1039 (John Hay, University of Waikato)	
16-697	A	29	1			References Another relevant reference is Uyarra, MC; Cote, IM; Gill, JA; Tinch, RRT; Viner, D; Watkinson, AR, 2005 Island-specific preferences of tourists for environmental features: implications of climate change for tourism-dependent states Environmental Conservation, 32(1), 11-19 (John Hay, University of Waikato)	Accept and will obtain the relevant reference
16-698	A	29	1			References Another relevant reference is Leonard Nurse and Rawleston Moore, 2005 Adaptation to Global Climate Change: An Urgent Requirement for Small Island Developing States. RECIEL 14 (2), 100-107 (John Hay, University of Waikato)	Accept and will obtain reference
16-699	A	29	1			References Another relevant reference is http://www.panda.org/downloads/climate_change/medreportfinal.pdf (John Hay, University of Waikato)	
16-700	A	29	1			References Another relevant reference is Bell and Bramwell 2005 Climate Change and Small Island Tourism: Policy Maker and Industry Perspectives in Barbados. Journal of Travel Research, Vol. 44, August 2005, 32-41 (John Hay, University of Waikato)	
16-701	A	29	6			formatting (Nick Harvey, University of Adelaide)	Accept
16-702	A	30	3	30	11	formatting (Nick Harvey, University of Adelaide)	Accept
16-703	A	30	5			Insert reference: Crabbe, M.J.C., Mendes, J.M. and Warner, G.F. (2002) Lack of recruitment of non-branching corals in Discovery Bay is linked to severe storms. Bulletin of Marine Science 70, 939-945. (Michael James Crabbe, University of Reading)	Has this being cited in the text
16-704	A	30	11		12	Eliminate reference---this is the same as Shea et al. 2001. (Cheryl Anderson, University of Hawaii Social Science Research Institute)	Accept
16-705	A	30	11	30	12	See also comment number 20; I am unclear as to the citation of East-West Center 2001 unless it refers to the Shea, et al (2001) Assessment of the Consequences of Climate Variability and Change which is referenced, appropriately as Shea et al, on page 33 (lines 17-21). (Eileen Shea, East-West Center)	Accept and correct
16-706	A	30	31			Carribbean Island (Joeli Veitayaki, University of the South Pacific)	The reference is for SIS
16-707	A	31	19			Insert reference mentioned above in No. 15: Hamnett, Michael P. and Cheryl L.	Accept

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						Anderson. Impact of ENSO Events on Tuna Fisheries in the US-affiliated Pacific Islands. SOEST Publication 00-03, JIMAR contribution 00-330, 27pp. (Cheryl Anderson, University of Hawaii Social Science Research Institute)	
16-708	A	31	43			formatting (Nick Harvey, University of Adelaide)	Accept and change
16-709	A	32	27			Mimurs' should read Mimura (Nick Harvey, University of Adelaide)	Accept
16-710	A	34	12	34	13	Remove this reference, as it is the same as the one on lines 10-11. (Sofia Bettencourt, The World Bank)	Accept, one reference will be deleted

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Additional late comment

16	4	35	4	37	<p>p.4 L. 35 to 37. Executive summary. The identification of globalization as a threat is questionable. If adequate policies to preserve the environment are implemented, the consequences of globalization to many of these islands may be very positive. The problem might be that governing bodies are not able to agree and implement the relevant policies to protect their natural resource assets. This element is a threat but perhaps not globalization as such. (Philippe Tulkens, TERI)</p>	
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Late Comment

16	4	35	4	37	<p>p.4 L. 35 to 37. Executive summary. The identification of globalization as a threat is questionable. If adequate policies to preserve the environment are implemented, the consequences of globalization to many of these islands may be very positive. The problem might be that governing bodies are not able to agree and implement the relevant policies to protect their natural resource assets. This element is a threat but perhaps not globalization as such. (Philippe Tulkens, TERI)</p>	
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