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

Government and Expert Review of Second Order Draft

Specific Comments

EXPERT REVIEW COMMENTS

Chapter 6

August 2006

Organization of the review comments file

Comments are organized as follows:

(a) First are the comments from the Co-Chairs and TSU. These:
  (i) track the development of the ZOD and FOD, and your responses to review comments on each of these drafts, and then
  (ii) present comments on the Second-Order Draft

(b) Second are the comments from the Expert Reviewers, organized in the same format as your FOD comments file.

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 AUGUST

Substantive comments

- The chapter writing team should discuss all substantive expert review comments, by email and/or at Cape Town.
- 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 should be kept in this document, ideally electronically.
- 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 **8th December 2006**.

Chapter 6

Comments from the Co-Chairs/TSU are laid out as follows: first we comment on whether the SOD addresses the comments we made on the ZOD; second we comment on whether the SOD addresses the comments we made on the FOD; our concluding comments on the Second-Order Draft are at the end

	Chapter 6 ZOD comments by Co-Chairs and TSU	Has this been addressed in the SOD?	Author responses:
6.Z1	The draft is approximately three times the length limit (see Blue Book Doc 3 for calculation of this)	SOD is now only 1 page overlength	Incorrect – chapter contains cross-chapter case studies – we are smaller than page limits
6.Z2	The length might be reduced by: a. emphasising the conclusions of each aspect of the assessment and substantiating this with references but omitting discussion of method (except where this clearly affects robustness of the conclusions, etc.) b. using tables to summarise knowledge c. emphasising knowledge that reinforces or revised conclusions of TAR and omitting details that are less policy-relevant d. reducing the four introductory sections to about five pages in all, giving you space for the core impact assessment	Done More summary tables included Reinforcement of TAR conclusions now clearly stated Future impacts now starts on page 14 compared to 32 in the ZOD	Not required
6.Z3	Section 6.5 on key impacts comprises less than a quarter of the ZOD but probably should make up half, since this is the guts of the assessment.	Now comprises just over a third in the SOD	Chapter team felt that the balance was about right and reflects literature
6.Z4	This reads well and the writing has clearly been co-ordinated. The early introductory and background sections are interesting and well written but they are far too long. Significant tightening is needed with careful summarising and / or concluding remarks at the end of sections and subsections. For example, you should attempt to achieve some global and regional summaries of projected effects.	Introductory and background sections reduced Global and regional summary tables/maps would still be useful	Regional flood results added in 6.4.2, and also in Box 6.6
6.Z5	The chapter introduces a lot of recent, post-TAR research and makes good key points throughout.	OK	Agreed
6.Z6	Please follow the numbered structure, as others chapters have	OK	Agreed
6.Z7	More (small) figures and tables are needed throughout to break-up unrelenting text.	7 tables and 3 figures in ZOD have increased to 9 tables and five figures in the SOD. Still some sections where figures/tables would be useful e.g., pages 14-21	Redistributed boxes to get an even spread through the text

6.Z8	In general, you will need to decide soon what is the most important new material that deserves inclusion, and what can be omitted. You then need to summarise your main messages.	ES is much more focussed in terms of main messages but the conclusions should be more clearly stated. Might help if section 6.8 had 'conclusions' in the title.	Done
6.Z9	Section 6.3 is especially strong. Section 6.5 is good in parts but unbalanced with some aspects (for example, sea grass, estuaries, indented coasts, corals) being long but worthy and others (for example, deltas) being too short by comparison.	6.5 is now 6.4. SOD has better balance now in this section. It could benefit from more illustrative examples to back up general statements	Done as much as space limits allow
6.Z10	Links to other sectors are generally good but coverage of agriculture and fisheries is a little thin and consequently, weak. This would benefit from more liaison with Chapter 5	Section 3.4.2.2 now covers agriculture, forestry and fisheries and contains many references to several other WG2 chapters. This section has been strengthened compared to the ZOD – particularly the fisheries section. Forestry is short, with no references.	Improved as much as possible – coastal forestry is not really a major topic!
6.Z11	There is quite a lot of repetition throughout the chapter	This is still the case in some sections.	Have removed as much as possible
6.Z12	With respect to European cases, examples are predominately from the UK	More balanced now	Have continued to work on this
6.Z13	The boxes tend to be way too long and we wonder whether Box 3 is really useful?	Box 3 has been removed	All boxes are small and consolidate specific examples/kmowledge
6.Z14	The section on IC(Z)M needs examples and doesn't cover local community involvement except in a very general way	Still applies	Disagree – Section 6.6 has a theme of integrated responses and there are lots of examples. The chapter team did not see ICZM as a panacea, and think the balance is about right.
6.Z15	Section 6.5.2 is really about costs and other socio-economic effects, is it not? We suggest you make this the new Section 5	Done	OK
6.Z16	Please try to identity (if possible) 'key' impacts in the sense of thresholds, which can help Ch 19 in drawing these together. Please ask yourselves for example: "What are key effects to avoid?"	The identification of threshold temperatures etc and associated impacts has not been incorporated in to the SOD with the exception of F6.3	This is difficult as the literature does not really support this synthesis. Also, as the Chapter recognises that Climate Change is causing multiple stresses on coastal systems, the notion of a simple threshold is not realistic.
6.Z17	Your references are biased towards the Northern Hemisphere (for example, we note a lack of southern references in your Box 1	Still NH dominated refs	We have continued to address as much as the NH-dominate literature allows.
6.Z18	You should note that IPCC has been requested to write in simple, clear, accessible language. We note that your ZOD contains significant amounts of jargon, complex terminology and acronyms that should be removed	Easy to read	OK
6.Z19	It is suggested that you highlight your conclusions	Done	OK

	regarding how this assessment: a. confirms conclusions of TAR, or b. revises them		
6.Z20	It is not always clear what the timescales are of your assessed effects under mean climate change: i.e., are they for the 2030s, or 2050s or 2080s?	Still the case. More information needs to be given regarding time slice, scenario and specific examples of impacts	The literature is rarely clear on these issues – where it is we use this information.
6.Z21	Is it possible to say anything about effects under: a. scenarios of stabilisation and b. different development pathways (e.g. SRES scenarios)?	Not done	Have added Box 6.6 on the long-term challenges of sea-level rise and we have include the sensitivity of impacts to development pathways in 6.4.2 (it was there already!)
	Chapter 6 FOD comments by Co-Chairs and TSU	**Has this been addressed in the SOD?**	**Author responses:**
6.F1	This draft is much advanced since ZoD.	OK	OK
6.F2	More contributing authors could broaden the range of examples.	Increase from 8 → 11 with the majority from the UK and NH	Have added one further USA/Australian CA
6.F3	Please follow recommended reduced form section headings, i.e. 6 should be "Conclusions: implications for SD" and should include broad conclusions (more below); and 5 should be "….socio-economic aspects"	Still some divergence from the PAO Please make your headings exactly those of POA, as have other chapters, so that readers can cross between chapters easily	Done
6.F4	Length: you have condensed much and focussed on your emerging key issues. Good but length still needs reduction. 22 pp refs=11 pp printed page; and 53 pp text = 39 pp printed. Text needs reducing by one-third to 25 pp	Now only 1 page over target of 40	Incorrect – chapter contains cross-chapter case studies – we are smaller than page limits
6.F5	I suggest: a) section 6 on adaptation be boiled down to one-half its present length. Too discursive. b) sections 1,2 and 3 be condensed by one-third. They cover the main points and just need distilling. c) section 4 should be half the whole text i.e remain its present length	a) Was 9 pages, is now 7 in SOD b) Done c) slightly shorter by 2 pages in SOD (19 → 17)	Basic lengths unchanged.
6.F6	Concentrate on distilling where possible and adding where advised by the specialised reviewers. Condensing could be achieved by i) taking all material in 6.4.2 to 6.5 (and condensing the current material in 6.5, but adding more on altered impacts (eg millions at risk) under different SRES and stabilisation scenarios (which seem to be missing) , ii) folding all 6.4.3 into 6.4.2 (Other chapters have done this).	i) stabilisation not covered – only two mentions of 550 ppm impacts. Please cover what little there is on stabn impacts, eg the millions at risk in coastal areas. ii) Not done	Box 6.6 addresses the main issue of mitigation for coastal areas – long-term sea-level rise
6.F7	Exec summary and conclusions: should emphasise a) what TAR conclusions are confirmed, and b) the key NEW conclusions you draw (I suggest in priority order), and c) attach confidence levels to these in the	This is clearly done in the ES of the SOD	OK

	ES		
6.F8	For concluding section I suggest you consider following the example of Ch 4 which created an effective summary of findings, thus: a) table summarising impacts by increments of T change (table 4.5); b) a summary of projected impacts worldwide (figure 4.9); and c) a burning embers diagram for each subsector to show key vulnerabilities (fig. 4.10 **Need to be clear where coral is covered, whether in ch 4 or 6, or in both	None of these suggestions have been incorporated in the SOD. Could this not be done?	The literature does not support – more flood results vs. SLR in Section 6.4.2
6.F9	**Case studies are good. What about joint one on recent tropical cyclones (with small islands chapter)	Hurricane Katrina case study included focussing on impact to coastal ecosystem services	OK
6.F10	Below is a copy of comments ON THE ZERO-ORDER DRAFT by Martin Parry [and in square brackets a comments regarding the response in the FOD revision}: The draft is 3 times the length limit (which should be 33 pages in this version, and equals 30 pages in the printed version). [ZoD is much condensed, but still needs more] Much of the text could be reduced by : 1) emphasising the conclusions of each aspect of the assessment, and substantiating this with references, but omitting discussion of method (except where this clearly affects robustness of the conclusions, etc.); [mainly now done] 2) use of tables to summarise knowledge; [much more could be done here, with tables to effectively summarise and save space, cf eg tables in ch 4 and boxes in ch 5] 3) emphasing knowledge that reinforces or revised conclusions of TAR; and omitting details that is less policy-relevant. 4) section 6.5 on key impacts at present comprises less than a quarter (in page terms) of the total, but probably should make up half, since this is the guts of the assessment; 5) Reduce the four introductory sections to about 5 pages in all; that would then give you space for the core impact assessment [FOD is getting there]	See responses to Z1→ Z20	

	Please folow the numbered structure, as other chapters have done. [now more like the common structure; with minor changes still recommended] Section 6.5.2 is really about costs and other socio-economic effects, is it not? Suggest you make this the new section 5. Are you able to achieve some global and regional summary of projected effects, perhaps tabulated and mapped? [not yet included in FOD and still recommended] Is it possible to separate out in the text a) the treatment of effects under different development pathways? Eg under SRES scenarios, and b) assesment of effects (and effects avoided) under stabilisation scenarios. [not yet included in FOD and still recommended] Finally, more (small) figures and tables to lighten up the unrelenting text. In general, you will need time to consider as a writing team what is the most important new material which deservs inclusion, and what can be omitted; and to summarise your concluding main messages. [FOD now has more focus, but key emerging issues not drawn together in conclusions and reported in ES] Is it possible to identity 'key' impacts in the sense of thresholds, which can help ch 19 in drawing some of these together (eg in terms of what are key effects to avoid) [more on this is now included in FOD, but how about (as done in ch.4) summarising in a table the projected effects for given increements of global T change/SL rise]		
	Chapter 6 SOD comments by Co-Chairs and TSU		**Author responses:**
6.S1	**LENGTH:**	41 pages (1 over the 40 target)	Incorrect – chapter contains cross-chapter case studies – we are smaller than page limits
6.S2	**ARE PAO HEADINGS PRESENT?**	Broadly, some changes included: 'Introduction' → Scope, summary of TAR	Done

		conclusions and key issues 'Assumptions…' → Assumptions …trends *for coastal systems and low-lying areas* 'Costs…' → Costs, benefits and other socio-economic consequences of climate change impacts 'Adaptation …' → Adaptation: *options, practices, capacities and constraints* 'Conclusions' missing from section 7 heading 'Key uncertainties and research priorities' → Key uncertainties, research gaps and priorities. Please make your headings exactly those of POA, as have other chapters, so that readers can cross between chapters easily	
6.S3	**HAVE MOST GENERAL COMMENTS OF ERs FROM ZOD AND FOD BEEN COVERED?**	Yes	OK
6.S4	**ARE REFERENCES BROADLY COMPLETE?**	yes	OK
6.S5	**IS THERE LINE-OF-SIGHT TEXT → ES AND TEXT+ES → TS+SPM?**	Generally yes. Can't find bullet point 5 information in the TS in the text of the chapter	Have worked on this extensively
6.S6	Format: write out in full the confidence levels in the Executive summary and remove 'Sections' in the square brackets of ES sourcing		Done
6.S7	Section 6.2.2: focuses on human utilisation of the coastal zone but is not clear in how human activities are exacerbating climate risks. It's clear how humans have stressed the environment but not how we increase exposure to climate risks. Suggest addition to this section or drop 'exacerbating climate risks' from the title		Done
6.S8	Sections 6.2.2 and 6.2.3 can be combined as much of what is mentioned in 6.2.2 is repeated in 6.2.3 with illustrative examples. The 3 lines on external marine influences is very short and needs expanding to contrast with the page spent discussing external terrestrial influences		Disregards original chapter guidance – not applicable
6.S9	Section 6.4.1.1 contains no examples or figures or tables. The discussion here would benefit from some illustrative examples, even if not global examples, site specific illustrations would make the section much more interesting. E.g, the chapter states that recent research has revealed important differences in cliff vulnerability – give some examples e.g., UK south coast is projected to erode at ?? rate; US east coast … etc. Give some quantification of future changes.		Agree – added examples of historic change – future changes are harder to chasracterise – no literature at the regional scale
6.S10	Section 6.4.1.2 is much better in terms of illustrative examples than 6.4.1.1. However, it tends to focus on observed changes in deltas e.g. ln 43-ln 4.		Agree – have moved Box to this section
6.S11	6.4.1.3, again, mostly broad statements only – two examples given but these come after about 1 page of text		Agree – have developed examples as much as possible
6.S12	7 pages from 14 to 21 contain no figures or tables, very few examples and not much on the specifics of future changes.		Moved delta Box to this section.
6.S13	A plot of global SLR and SST change in the future would be very useful, perhaps with some regional inserts to show local SLR differences from the global projections.		Have augmented scenarios in Section 6.3.2 as much as possible – the

		suggested plot is not possible for AR4 as WG1 do not provide the necessary data.
6.S14	Changes in SSTs not mentioned in section 6.3 but referred to frequently in section 6.4. Would be good to include SST projections in 6.3.	Accepted and done (via new contributing author)
6.S15	Section 6.6.2 is very short considering the statement that information on the costs of adaptation has increased dramatically since the TAR	See the point, but we are under page pressure – so no major expansion possible.
6.S16	**IN SUMMARY THE AUTHORS NEED TO:** • summarise current knowledge of impacts under SRES and stablisation (especially since this is one of the fields in which information is available for these scenearios). • Try to summarise effects in a) table summarising impacts by increments of T change (as in ch 4; could then be used in Fig 3 in SPM); b) a summary of projected impacts worldwide (cf ch 4); and c) a burning embers diagram for each subsector to show key vulnerabilities (cf ch 4) • Need more specific examples to back up general statements – don't get to specifics until section 6.5.3 p34 • Need to watch overlap/repetition (e.g, see 6.S8 plus others indicated in spreadsheet) • Figures/tables/more examples needed in pages 14-21 • Need to include overview of SST changes in section 6.3 Where other chapters are referenced, please give section numbers	Done as much as possible. Note for "Need more specific examples to back up general statements – don't get to specifics until section 6.5.3 p34" – space (and sometimes the literature) is a major constraint on our response.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
E-6-1	A	0				Very good chapter. There is some repetition in, for example, the discussions of coral reefs and deltas, which are currently covered in more than one section. If these comments could be consolidated, it should be possible to reduce the length slightly. (Anthony Clayton, University of the West Indies)	Agree
E-6-2	A	0				Tourism is substantially dealt with in CH 1,4,6,7,91112,13,14,16 . This is a significant change compared to TAR. Overall this is done in a satisfactory manner , in particular since the regional chapters do focus on regional issues without losing space on general aspects. What is missing though, is a critical assessment of the literature quoted (even though this literature is peer reviewed), not an individual assessment of papers but a critical overview of the mainstreams of methods that have been used these last years (though it must be recognised that these works have shed some light on what is a very important issue). This concerns both qualitative and speculative approaches and quantitative research. As regards the former, these confront current tourism behaviour and requirements regarding climate to the futures envisaged by scenarios. What is the degree of reliability of this kind of work knowing that the expectations of tourists regarding climates can evolve significantly, as they already have done in the past? There is at least a need for research to explore the range of possible evolutions in behaviours and introduce that into the analyses. Also, to what extent are econometric analyses concerning modifications in tourist flows (the more seducing as they yield figures…) robust and reliable? Is it, for example, acceptable to use a unique climate for the US as it is done in a paper quoted in several chapters? If it is, the coarseness of the results should be mentioned. In short, I believe that there should be in some place in the report, a caveat on the difficulties research on this topic encounters (uncertainties on future behaviours, shortcomings regarding statistics etc.) and their consequences on the results. (Jean-Paul Ceron, CRIDEAU (Université de Limoges-CNRS-INRA))	Diagree – Chapter 7 issue – we are talking about coastal tourism
E-6-3	A	0				This chapter now reads very well and, in my view, conveys its contents clearly. I have only some minor comments of an editorial nature. (Peter Saenger, Southern Cross University)	Agree
E-6-4	A	0				This chapter is greatly improved from the FOD and covers the issues well. There is little duplication and the structure seems to work well. There is a great contrast between the style of the text describing the natural systems and that covering human impacts, vulnerability etc. The frequency of citations is greatly reduced in	Agree – note citations in sumary tables in Section 6.6

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						the latter sections. This may be due to the smaller amount of literature (as acknowledged in the text) but it can give the appearance that the statements are from the authors of the report, rather than (which I think is the intention) that the authors are assembling and synthesising existing information. The 'quality' of the citations is much improved over FOD which most in the perr-reviewed literature. I think some attention still needs to be paid to the use of technical reports from local institutions and submitted papers should never be cited (perhaps these are being used by the team as place holders, anticipating that the status will change prior to publication - this maybe a reasonable approach if there truly are no existing sources). (Denise Reed, University of New Orleans)	
E-6-5	A	0				The text in the second draft has much improved. The chapter text is clearer and easier to read, and the figures are very useful for the reader. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Agree
E-6-6	A	0				The content is little changed from my first reading in November 05. The lack of emphasis on the coastal oceanography of the continental shelf is too bad, but I guess this must be covered in some other chapter. The chapter is very strong on sea level change, and weak on most everything else (wetland and floodplain ecology, salinization of coastal plain groundwater, eutrophication & acidification of coastal seas). The section on the economic cost of sea level rise and other climate change impacts is good, but it doesn't address ecological goods & services in the same way. Somehow we need to suggest that cities and future development should back away from the near coastal region, involving insurance and financial institutions. There is increasing development of man-made facilities directly on the coastline, which is probably not a wise thing to do for the next century. (Gregg Brunskill, Australian Institute of Marine Science)	Oceans omitted due to pleanry decisions Ecological goods and services in Chapter 4 Planned retreat is included, but we should not be precriptive.
E-6-7	A	0				The chapter's conclusions, all of which appear to be directionally correct, are presented in qualitative terms only, making it impossible to evaluate either their absolute or relative importance. As many of the conclusions as can be need to be quantified so that policymakers have a basis for acting on them. (Lenny Bernstein, L.S. Bernstein & Associate, L.L.C.)	Agree – reflects literature Global projections are not applicable at regional and local levels – note the role here of the regional chapters
E-6-8	A	0				My main concerns about the latest version of this chapter is that there are some key topics which are omitted at present and that the content is largely based on the direct impacts of climate change on different sectors/systems and how they will be impacted. There is little on how changes in one sector/system may lead to larger problems than just considering climate change on its own. Examples of these more complex, indirect interactions are suggested below and inclusion of these would	Agree – but this assessment reflects the literature. Most points are covered. Human influences are covered

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						greatly help illustrate both the urgency and severity of considering climate change. Similarly, it would be fruitful for more emphasis to be placed on the links between land-based/catchment predictions of change and how this will impact on estuarine and coastal responses. Such linkages are often lacking in environmental policies and reports, but these are the exact correlations/linkages that need to be demonstrated to help provide the evidence-base to modify or enforce environmental policies and regulations, respectively. There also need to be greater hooks and articulation of the need for climate change to be considered as part of policy making – and associated regulations, as it is difficult for regulatory bodies and local governments to have foresight to consider climate change when they have so many other more pressing targets by which their success is measured. (Larissa Naylor, Environment Agency & University of East Anglia)	
E-6-9	A	0				In general, this chapter downplays the risks posed by sea level rise and, in particular, the risk of very large sea level rise associated with collapse of the West Antarctic Ice Sheet and significant or total melting of the Greenland Ice Cap. As well, there are no references to the appropriate sections of WG1 dealing with scenarios of sea level rise. (Danny Harvey, Dept of Geography, University of Toronto)	Agree – have added new Box 6.6 which reflects WG1 views and points out impact and response implications
E-6-10	A	0				Good chapter! Much is based on sea level rise, but there is no clear graph of this, and its possible variants in different places. One small element of one fig shows one possibloe curve, of limited use. I think such a graph would be very valuable here. (Charles Sheppard, Warwick University)	Agree
E-6-11	A	0				General comment: There is no text on the CO2 trapping abilities of tidal saline wetlands. If this topic is covered in another chapter then please disregard this comment. But if this topic is not covered in another chapter, then there should be some description of this important ecosystem service. Tidal saline wetlands are more efficient trappers of CO2 than peatlands (Chmura et al. 2003). (Donald Cahoon, Patuxent Wildlife Research Center)	Disagree – we are not dealing with mitigation (WGIII issue)
E-6-12	A	0				Finally I want to congratulate the authors to the good and sound chapter. (Wilhelm Windhorst, Kiel University)	Agree
E-6-13	A	0				Dissapointing that we are still not prepared to give some guidance on the likely costs and benefits and hence the relative merits of adaptation and mitigation. Particulalry given that progress has been made on doing a range of estimates, such as in Foresight Flooding in the UK and subsequent specific consideration of the coastal case (Hall et al, 2005, Burgess et al, 2004) (Ian Townend, HR Wallingford)	Disagree – insufficient global estimates available for such as estimation – references suggested have been included.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
E-6-14	A	0				Comprehencive approach for climate changes' impacts on coastal systems and low-land areas. Present conditions and future trends are fully analysed. Very effective when assessment tools are listed. (Miltiadis Seferlis, Greek Biotope Wetland Centre)	Agree
E-6-15	A	0				"An appendix with the list of acronymous would be useful for readers, e.g., VHC, LC,etc (since the Executive Summary)" (Ana Ramos Pereira, University of Lisbon)	Agree – acroymns removed fropm Executive Summary
E-6-16	A	1	1	64	39	This version is a vast improvement comapred to the previous. I can only therefore make the following editorial changes. (Bhawan Singh, Universty of Montreal)	Agree
E-6-17	A	1		64		I enjoyed reading this draft. It now has a good balance between physical and human aspects, has some good, helpful tables and is well-referenced (Heather Viles, University of Oxford)	Agree
E-6-18	A	3	3	3	20	Our comments include the following new source of literature that we recommend for inclusion in the references' list: 1. Living with risk: a global review of disaster reduction initiatives. UNISDR 2004. (http://www.unisdr.org/eng/about_isdr/bd-lwr-2004-eng.htm) (Silvia Llosa, ISDR System)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-19	A	3	3	3	20	as written, meaning unclear (,)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-20	A	3	3	4	21	Need to define VHC, HC, LC and MC. (Bhawan Singh, Universty of Montreal)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-21	A	3	3			Please explain TAR at this place, equivalent to the way as it is done in the beginning of chagp 6.2 (Wilhelm Windhorst, Kiel University)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-22	A	3	5	3	5	Suggesting deletion or changes in given examples: hurricane is not a world-wide used word and tsunami is difficult to perceive as non-climatic event. Suggested alternative examples, hurricane/cyclones and salinity intrusuin (Rafiqul M. Islam, Integrated Coastal Zone Management Program)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-23	A	3	5	3	5	suggest you replace the word 'impacts' with 'hazards', which more clearly indicates the potential for impact (Donald Cahoon, Patuxent Wildlife Research Center)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-24	A	3	6	3	6	What does VHC mean? (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-25	A	3	7	3	8	change to "impacts of sea level rise due to climate change" (Unnikrishnan Alakkat, National Institute of Oceanography)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-26	A	3	7		20	needs rewording as it diesn't read well, particulalry from '…and tropical cyclone	Comment noted. Executive Summary

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						impacts…' (Clair Hanson, IPCC TSU)	completely redrafted from the SOD to FGD.
E-6-27	A	3	11			bullet refers to ecosystem losses but referenced sections outline changes (gains and losses) with the exception of coral reefs (Ian Townend, HR Wallingford)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-28	A	3	12	3	12	What does HC mean? (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-29	A	3	17	3	20	This paragraph is not clear. It should be split in two or more sentences. E.g.: Direct impacts of human activities on coasts have been more significant than impacts attributed to cklimate change. Tropical cyclone impacts have been accentuated by growing coastal population. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-30	A	3	18	3	20	The second half of this sentence is very confused, apparently because of problems with cutting and pasting text. It might be helpful to split this one-sentence paragraph into two sentences. (Donald Cahoon, Patuxent Wildlife Research Center)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-31	A	3	20	3	20	What does LC mean? (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-32	A	3	25	3	25	See also 6.2.5 and 6.4.1.4. Recent work suggests that changes in ocean chemistry may be more important than changes in temperature for the survival and performance of many organisms. Ocean circulation which drives larval transport will also change. (One source 'From the impacts of climate change in coastal and marine systems, 2006 Ecology letters, 9:228-241). (Silvia Llosa, ISDR System)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-33	A	3	26	3	26	mean' could be defined (Silvia Llosa, ISDR System)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-34	A	3	26			mean increase … of sea level rise ….should be included to make the sentence consistent (Wilhelm Windhorst, Kiel University)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-35	A	3	27	3	27	What does MC mean? (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-36	A	3	31	3	32	similar lines as above p3 line 7 to 8) (change to "impacts of sea level rise due to climate change") (Unnikrishnan Alakkat, National Institute of Oceanography)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-37	A	3	31	3	36	coastal SYSTEMS exist because of the dynamic interplay between between tectonics, sea level and sediment supply. Impacts cannot therefore be negative for the system per se. They are only negative in terms of anthropogenic activities and	Comment noted. Executive Summary completely redrafted from the SOD to FGD.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						preferences. (Ian Townend, HR Wallingford)	
E-6-38	A	3	37	3	40	Sentence structure: it could be split in 2 sentences. Is the thermal stress the most important one? Then it should be clear in a separate sentence. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-39	A	3	38			the literature justifies a much stronger statement on coral reefs, such as" for most if not all coral reefs, thermal stress trehsolds will be crossed within the first half of this century …" (Danny Harvey, Dept of Geography, University of Toronto)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-40	A	3	43		45	From my aspiration, there is no need to use flooding and inundation, as I cannot grasp the differnce yet. This holds alos for secondary and indirect effects, as long as the differences are not defined. (Wilhelm Windhorst, Kiel University)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-41	A	3	45	3	45	"….effects include among others impacts on agriculture, fisheries, tourism, energy and water costs, and health". (Yves Henocque, Department of Fisheries)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-42	A	3	46			replace "when stresses on natural systems intersect …" with "when natural system dynamics intersects …" (Ian Townend, HR Wallingford)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-43	A	3	50	3	50	add 'variability and' before change. Resilience could be added as a factor of influence. (Silvia Llosa, ISDR System)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-44	A	3	51	3	51	Replace the word 'and' with the word 'with' in the latter part of this sentence, so it reads "coastal communities with limited access…" (Donald Cahoon, Patuxent Wildlife Research Center)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-45	A	3	51	4	1	Though I share the indication that low-lying developing countries etc are most threatened. I reccommend to include that alos low lying areas in developed countries are at risk, as long as the politicians, responsible managers and population underestimate the risks. This can be clearly demonstrated with the New Orleans Case, where levees were not elevated though subsidence of New Orleans. This indicates from my perspective, that also risk awareness has to be named at this place as major component to influence vulnerability. I advocate for this addition as otherwise the impression could be that those developed countries being responsible for the major part of green house gas emission have done their homework. But I believe the change of attitudes towards ecological risks in developed countries is the blueprint for successfull assistance to and action in those countries with the highest vulnerability.	Comment noted. Executive Summary completely redrafted from the SOD to FGD.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Wilhelm Windhorst, Kiel University)	
E-6-46	A	3	51	4	1	Sentence is cumbersome. It needs to be rephrased. (Bhawan Singh, Universty of Montreal)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-47	A	3	51			and limited access' replace 'and' with 'with' (Clair Hanson, IPCC TSU)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-48	A	3		4		ES: write out confidence levels in full and remove 'section(s)' from square brackets. Just the source numbers are sufficient (Clair Hanson, IPCC TSU)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-49	A	4	3			Focussing in the summary on adaption, without providing a definition, is missleading the quick readers. Please name some areas and actions of adaption to allow quick readers an understanding. This is also the place to refer to the progress of ICZM in the sense as it is done in chap 6.6.1.3 (Wilhelm Windhorst, Kiel University)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-50	A	4	6	4	6	suggest you delete the phrase "reducing climate risks" because the sentence reads ok without it. (Donald Cahoon, Patuxent Wildlife Research Center)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-51	A	4	8		12	This sentence is very unclear. Which protection measures are discussed? Which measures are part of the portfolio? (Wilhelm Windhorst, Kiel University)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-52	A	4	11	4	12	To facilitate the reader of only executive summary, such as policy makers; I shall suggest inclusion of key adaption measures in bullet points. These points, from section 6.6, can be: a) Wider dissemination of identified tools for assessing adaptation needs and options; b) support introduction and implementation of ICZM in developing countries; c) incentive for generating ecological knowledge and translating it into information that can be used in governance of coastal social-ecological systems; d) mainstreaming climate change adaptation in development policy and strategies of respective governments; e) enhance adaptive capacity of coastal communities; f) establish the links between adaptation and mitigation in coastal and low-lying area; and g) increased research of interaction between natural and human sub-systems. (Rafiqul M. Islam, Integrated Coastal Zone Management Program)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-53	A	4	14			replace "impediment" with "challenge"? (Ian Townend, HR Wallingford)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-54	A	4	17	4	17	add 'risk' between disaster and management (Silvia Llosa, ISDR System)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-55	A	4	19			after "generations," add "with a potential sea level rise of 10 m or more over a period of about one thousand years,"	Comment noted. Executive Summary completely redrafted from the SOD to FGD.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Danny Harvey, Dept of Geography, University of Toronto)	
E-6-56	A	4	21			Would it be worth adding here that adaptation needs to cope with both VHC and much less certain future predictions - thus we need to be able to cope with uncertainty as well as clear outcomes (Heather Viles, University of Oxford)	Comment noted. Executive Summary completely redrafted from the SOD to FGD.
E-6-57	A	5	5	5	5	Why not: (For marine ecosystems see chapter 4)? (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Agree
E-6-58	A	5	6	5	9	"Section 6.1 - shallow coastal waters are above the inner continental shelf, so I propose for line 9: "but excludes the deep continental shelf and ocean margins" (Ana Ramos Pereira, University of Lisbon)	Agree
E-6-59	A	5	10	5	13	The passage starting at "In addition…" does not fit into this paragraph. It fits better in the beginning of next paragraph starting at line 15. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Disagree
E-6-60	A	5	15	5	50	Which are the climate change drivers? It is not clear in the text. Are they the same as the "climate change factors" cited in the figure 6.1 caption i.e. storms, waves, sea level, temperature, CO2 concentration and runoff? Please review this passage, especially the first part between lines 15-18. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Agree – drivers in Fig 6.1
E-6-61	A	5	29	5	51	Fig.6.1 is not clear enough in cause-result relationship. In fact, Climate change results in storms, waves and sea level belonging to external marine influece, result in run-off (maybe including sediment load) belonging to terrestrial ifluence, and in a changing of temperature and CO2 concentration in the coastal sea as well, which influence on the coastal system. Fig.6.1 should be re-designed by cause-result ranged relationship. (Congxian Li, Tongji University)	Disagree – Fig 6.1 organises everything that follows and is referred to in a number of subsequent sections
E-6-62	A	6	4			sea level rise still dominates the litt.' No. Depends whose litt ! I think changing rain, hurricanes, temp rise dominate as much. (Charles Sheppard, Warwick University)	Disagree –clarified text
E-6-63	A	6	7			Please indicate at least one example for coastal adaption (Wilhelm Windhorst, Kiel University)	Disagree due to space – examples in 6.6
E-6-64	A	6	14			This section should include some explicit discussion early on of how the natural dynamics of coastal systems can make it difficult to identify the impacts of climate change. The concept is implicit now but should be expounded at the start of the section to provide the climate change context for the subsequent discussion. (Denise Reed, University of New Orleans)	Agree, statement added to 6.2.1
E-6-65	A	6	16	6	16	make the word way plural = ways (Donald Cahoon, Patuxent Wildlife Research Center)	Done

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
E-6-66	A	6	20	8	29	Sections 6.2.1-6.2.4 are well written subject summaries but not new. They provide a context but if there is a need to shorten the text, reference to some standard textbooks would suffice. (Ian Townend, HR Wallingford)	Done – Woodroffe 2003 Dronkers 2005
E-6-67	A	6	31	6	35	"Equilibrium" issue which is commended in these lines should be incorporated in the previous paragraph from line 22 to line 29. The difference between a "simple" and a dynamic "equilibrium" is not very clear. (Miltiadis Seferlis, Greek Biotope Wetland Centre)	Reworded, and with further text in 6.2.4
E-6-68	A	6	35			This sentence is confusing. I think this is because of the limited meaning being attached to external stimuli. If the system is sufficiently well specified, then internal thresholds can often be predicted (certainly as far as the examples cited). However, this prediction will necessarily define response envelopes rather than deterministic predictions of any change because of the chaotic nature of the system dynamcis. (Ian Townend, HR Wallingford)	This comment is not very clear, but rewording of 6.2 should address this concern
E-6-69	A	6	35		42	I have big doubts that using the word theshold is accepable, as changes in ecosytems take place all the time and crossing thresholds like pollination etc. are key processes determing life! In line 35 I recoomed to replace threshold by "changes" and in line 41 by "factors". Otherwise it is necessary to explain how and by whom threshold is/are defined, and how it is/ they are indicated, so that society can react. (Wilhelm Windhorst, Kiel University)	Disagree. Both threshold and non-linearity are in glossary. Further clarification has been added here and in 6.2.4 based on Dronkers 2005
E-6-70	A	7	2	7	2	Insert the citation by Rogers et al. 2005 who report the effect of ENSO-induced droughts on decreases in mangrove soil elevation. Full citation = Kerrilee Rogers, Neil Saintilan, and Donald Cahoon. 2005. Surface elevation dynamics in a regenerating mangrove forest at Homebush Bay, Australia. Wetlands Ecology and Management 13:587-598. (Donald Cahoon, Patuxent Wildlife Research Center)	Done
E-6-71	A	7	2	7	2	Box 6.1 is two pages ahead. Can this be modified? (Miltiadis Seferlis, Greek Biotope Wetland Centre)	This will not be a problem in the published report
E-6-72	A	7	6	7	6	"The studies on the NAO index reveal its importance for climate change and the coast. Despite the uncertainty still existing, I suggest to add the following phrase: "In what concerns the Atlantic coasts, namely the eastern ones, the role of North Atlantic Oscillation (NAO) need further research. The correlation between NAO index, storm frequency and impacts and responses from coastal systems is still a subject of discussion." (Ana Ramos Pereira, University of Lisbon)	NAO added – also PDO and IOD which addresses two other concerns raised later by other reviewers

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E-6-73	A	7	9			This section doesn't actually address 'exacerbating climate risks'. It really just looks at vulnerability, suggest changing the heading (Denise Reed, University of New Orleans)	Agree – heading changed and the clause is now omitted from heading
E-6-74	A	7	11	7	12	There s repetition here: the first sentence says that few of the world's coastlines are free of human influence, so no need to say that many are human-dominated. Please review this passage. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Reworded – although there is a misconception here as the two are different things – influence and dominance mean different things
E-6-75	A	7	16	7	16	"Section 6.2.2. According to Earth Trends, in 1995, the world population living within 100km distance from the coast was 39%. Understand that the value 23% includes people living at 100m elevation; consider revising the value 23% (http://earthtrends.wri.org/ - section coastal and marine ecosystems) (Ana Ramos Pereira, University of Lisbon)	The figure is the correct one from Small and Nicholls ref – Nicholls is our CLA!
E-6-76	A	7	17	7	18	The refereed statement " and population densities in coastal regions are about three times higher tha the average" is a definitive statement which is not true everywhere. I suggest deletion of this part of the sentence (Rafiqul M. Islam, Integrated Coastal Zone Management Program)	It is a generalisation consistent with what is said in the Small and Nicholls ref – Nicholls is our CLA!
E-6-77	A	7	23	7	23	add 'including through accidental pollution such as oil spills' (Silvia Llosa, ISDR System)	Disagree – text is OK without this – space constraints prohibit further clarification
E-6-78	A	7	25	7	25	It should either be "introduction of species" or just "invasive species" (Miltiadis Seferlis, Greek Biotope Wetland Centre)	Disagree – the point is valid, but introduction and invasiveness are not synonymous
E-6-79	A	7	27	7	33	The passage beginning with "Natural systems…" could be a separate paragraph. Additionally the first sentence could be more straightforwar: The above-cited human activities alter the natural systems and the ecological services provided by them. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	
E-6-80	A	7	27	7	28	Rephrase sentence. (Bhawan Singh, Universty of Montreal)	Disagree – sentence seems fine
E-6-81	A	7	28	7	33	"Ecological services" and "ecosystem services" are used inderchangebly and readers may be confused. It is not the same. All those "services" listed in the parenthesis of line 30-31 are rather functions of mangrove forests and not all of them are ecological. Some of them are hydrological (wave attenuation) and biogeochemical such as nutrient accumulation). (Miltiadis Seferlis, Greek Biotope Wetland Centre)	This has been looked at closely – but the two are not synonymous, and the more correct term has been adopted in each instance
E-6-82	A	7	29		33	The examples in the brackets are fine, but there are not fully consistent with those in section 6.4.2 in tab 6.3. Hence I recommend to create consistency and to refer to table 6.3. Concerning the reference on secition 6.4.1.3 I recommend to replace by the refernce on section 6.4.2	Noted in the rewiting process and any inconsistencies that remain after rewriting of these sections are no longer causes of serious concern

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						(Wilhelm Windhorst, Kiel University)	
E-6-83	A	7	35	7	37	Please avoid using semi-colon. "Migration …" could be a separate sentence. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Semicolons now used only after due consideration. Copy editor task.
E-6-84	A	7	37	7	39	There is repetition of information here. The coastal population density has been already assessed in lines 15-18 in this page. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Sections have been re-organised addressing this issue
E-6-85	A	7	39	7	39	This statement needs a reference (Rafiqul M. Islam, Integrated Coastal Zone Management Program)	A UN source was used to compile these numbers that are readily available in atlases
E-6-86	A	7		8		Sections 6.2.2 and 6.2.3 can be combined as 6.2.3 generally repeats the discussion in 6.2.2 but with some added illustrative examples (Clair Hanson, IPCC TSU)	NO. Reviewer has misunderstood here. Section 6.2.2 covers DIRECT impacts on the coast, whereas section 6.2.3 refers to human impacts in catchments that then have external impacts on the coastal zone. Consistent with PAO
E-6-87	A	7				Section 6.2.2 - not clear in this section how human activities exacerbate climate risks (Clair Hanson, IPCC TSU)	No longer an issue a heading changed – see 6-73
E-6-88	A	8	10	8	13	The sentence is slightly confusing. (I would suggest to remove "tsunami" from this) (Unnikrishnan Alakkat, National Institute of Oceanography)	Re-organised for clarification
E-6-89	A	8	10	8	13	The inclusion of ocean currents, tsunami and dust storms in one sentence with no specific examples or detail adds little. Atmospheric dust is not an external marine influence and the effects of dust on coastal environments needs to be amplified if it is important enough to mention. The title of the Shinn paper implies what effect is being referred to but it needs to be in the text. (Denise Reed, University of New Orleans)	Re-organised for clarification, and the pint that dust is atmospheric now included
E-6-90	A	8	10	8	13	The external marine influence is not well explained here as the external terrestrial influence. Changes in ocean currents may influence biodiversity, tsunamis have a tremendous erosion/physical impact on shores, and atmospheric inputs have influence on the biogeochemistry functioning of the system. Dust transport nutrients and/or pollutants. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Agree – re-organised and expanded for clarification
E-6-91	A	8	10	8	13	"Section 6.2.3. The phrase is ambiguous. Phrase proposed: "Coasts can be affected by external marine influences (fig.6.1). The high-energy swells generated far away (Vassie et al, 2004) and the waves associated with storm and/or storm surges are both forcing factors of coastal changes. In addition, coasts are sensitive to another kind of waves, the low frequency but high energetic waves generated by earthquake (tsunamis). Ocean currents and tidal currents at a regional scale, through their	Agree – re-organised and expanded for clarification

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						influence on heat transfer, can also modify coastal environments. The atmospheric inputs, such as dust (Shinn et al, 2000), may be a triggering factor for coastal ecosystem". (Ana Ramos Pereira, University of Lisbon)	
E-6-92	A	8	10		13	external marine influences paragraph is very brief - can this be expanded and some illustrative examples included? (Clair Hanson, IPCC TSU)	Agree – re-organised and expanded for clarification
E-6-93	A	8	16			The title of the section can be misleading. The authors purely relate to geomorpholical and ecological issues in the text and not the socio-economic system. Hence, either the title should be altered or a connection should be drawn to the changed - normally drastically reduced - amount of ecological (in my wording I woud prefer ecosytem services) provided for human well being. I feel it important to make this clear, as it eases the communication. The role of science is to identify and to highlight the connectedness of ecosystem functioning with the provision of ecosystem services. Men has to decide wether the provided ecosystem services are sufficient or management schemes should be implemented to protect or to improve the provision of ecosystem services. (Wilhelm Windhorst, Kiel University)	Although not entirely understanding the comment, this section has been re-organised and expanded for clarification
E-6-94	A	8	18	8	20	This sentence implies that if something is non-linear a threshold is involved. I think the concepts of non-linearity and thresholds should be separated to avoid confusion. (Denise Reed, University of New Orleans)	Agree - re-organised and expanded for clarification, and the terms are covered in the glossary
E-6-95	A	8	18	8	29	It is useful to mention non linearity and thresholds. It might also be worth pointing out that many natural systems, because of complex interactions within the system, show non linear or threshold behaviour without any external threshold being breached. Thus, for example, a marsh system might show some catastrophic ecological change (geese 'eat-outs, Spartina die-back, excessive snail grazing in combination with drought) which may then be reflected in great sediment loss, enhanced by sea level rise). This sort of behaviour is very difficult to predict and relate to any obvious thresholds of, say, sea level or temperature, but can have huge impacts. (Heather Viles, University of Oxford)	Agree – re-organised and expanded for clarification. The ideas here are very useful but space precludes expansion of text to add them (revised text addresses the substance of the comments)
E-6-96	A	8	18	8	20	Explanation of 'non-linear' could be greatly shortened. (Charles Sheppard, Warwick University)	Agree – re-organised and non-linearity is in glossary
E-6-97	A	8	18	8	19	"Dynamic coastal systems often show complex, non linear-responses to change caused by interactions between fast and slow variables (Gunderson and Holling, 2002). (Yves Henocque, Department of Fisheries)	Agree – re-organised and expanded for clarification. Dronkers reference added

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E-6-98	A	8	21			unconsolidated' is redundant (Denise Reed, University of New Orleans)	Agree - removed
E-6-99	A	8	25	8	27	Are these 'abrupt' changes due to thresholds in the rate of rise or the actual level. If level then they are controlled by form as much as sea level rise. Suggest this should focus on thresholds in rate, especially given the previous discussion of coastal system dynamics and processes. Overtopping of artificial emankments seems out of place here as do floodplain levees, is referred to sea level changes. Also Doyle et al is a weak reference for this topic. (Denise Reed, University of New Orleans)	Agree – re-organised and expanded for clarification. Doyle ref reconsidered but as it does provide further, albeit it weak, support it remains
E-6-100	A	8	39	8	40	The choice of the reference by Hughes and Paramor (2004) is odd here. This research has been contested. A recent review - which would be a better reference to use here - by Wolters et al. (2004), for example, concludes that although laboratory evidence shows that bioturbation and herbivory by the ragworm Nereis can lead to sediment instability and loss of pioneer plant species the field evidence is more equivocal. [Wolters M, Bakker JP, Bertness MD, Jefferies RL and Moller I 2005 Saltmarsh erosion and restoration in south-east England: squeezing the evidence requires realignment. Journal of applied Ecology 42: 844-851] (Thomas Spencer, University of Cambridge)	Accepted – replacement made
E-6-101	A	8	43			There is emerging evidence of huge shifts in rocky shore species related to changes in SST (Mieszkowska et al, HYDROBIOLOGIA 555: 241-251 FEB 2006; Helmuth et al. ANNU.REV.ECOL.EVOL.SYST. 37 (in press); Southward AJ et al. ADVANCES IN MARINE BIOLOGY 47: 1-105 2005) including relaxation of upwelling (Lima FP et al. JOURNAL OF BIOGEOGRAPHY 33 (5): 812-822 MAY 2006). Many coastal systems are dependent on upwelling to drive artisanal food collection (e.g. Chile and South Africa - Navarrete et al, PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 102 (50): 18046-18051 DEC 13 2005; Fernandez & Castilla, CONSERVATION BIOLOGY 19 (6): 1752-1762 DEC 2005; Castilla & Defeo, SCIENCE 309 (5739): 1324-1325 AUG 26 2005). Higher frequency of ENSO events would substantially affect production as well as impact on ecosystem goods and services. (Stephen John Hawkins, The Marine Biological Association of the United Kingdom)	This reviewer has kindly brought a number of references to our attention, that were also flagged by reviewer Naylor both in FOD and SOD. Careful consideration of these references indicates that the majority say a similar thing and that while the authors of the papers may consider these HUGE shifts, the ecological adjustments are part of a series of complex changes with climate as one of many factors. The Hawkins et al 2003 reference has been added to 6.2.5 in recognition that this literature implies an 'observed effect', and others of the references have been considered for inclusion in 6.4 where they appear more appropriate.
E-6-102	A	8	45	8	47	How does warmer conditions, including coastal ice sheet melting, mean a greater potential for wave generation? (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Waves cannot form or reach a coast if it is covered with sea ice – so when ice melts the coast is exposed to waves – Reworded with assistance from CA Forbes plus Forbes 2005

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E-6-103	A	8	45			insert 'adverse' before 'impacts' (Clair Hanson, IPCC TSU)	Done – and sentence reworded
E-6-104	A	8	47	8	47	Suggest mentioning specifically that this increased potential is due to increased depth and fetch of coastal waters, or explaining the origin of the potential if that is not the reason. The reference here seems obscure and doesn't obviously indicte the implied mechanism for wave generation. (Denise Reed, University of New Orleans)	Reworded and Forbes 2005 ref added
E-6-105	A	9	0			The discussion of the multiple stresses on coral reefs is repeated in more than one section. In the case of Jamaica, the coral reefs have degraded over the last three decades from a pristine, high diversity coral-dominated environment, to a low diversity algae-dominated environment, ranging from damaged to dead reefs. The major factors have been over-fishing, pollution (primarily excess nutrient inflow), severe storms and hurricanes and a disease (probably viral) that wiped out a keystone species in the mid-1980s, the sea urchin Diadema antillarum. It is important to note that only the first two of the factors listed above are anthropogenic. The other two are natural, and at least one (storm damage) occurs frequently in the Caribbean, and is in fact part of the natural dynamic processes of coral reef ecology. This highlights the probable importance of multiple 'hits'; coral reefs are probably capable of dealing with one or two of these factors at a time, but not with all of them simultaneously. The single most important factor is probably over-fishing, which could be controlled. See Michael Haley and Anthony Clayton The Role of NGOs in Environmental Policy Failures in a Developing Country: The Mismanagement of Jamaica's Coral Reefs. Environmental Values 12 (2003): 29–54 (Anthony Clayton, University of the West Indies)	Coral reefs are a cross-chapter case study – and the content has been reveiwed across (and within) chapters. It is important to emphasise that this coral reef section illustrates thresholds (6.2.4) AND 'observed effects' (6.2.5) and that is why it is here. Later treatment is relevant to other components. Caribbean component of material on reefs strengthened
E-6-106	A	9	1			I didn't know ecologists had been around long enough to have traditional knowledge? (Ian Townend, HR Wallingford)	Agree - reworded
E-6-107	A	9	7	9	9	Was coastal erosion also observed in the Bering Sea and in the Gulf of St Lawrence? (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Yes- a good point, reworded to include erosion - and Baltic Sea added
E-6-108	A	9	11			Can we be more specific than 'Global warming' - increased sea surface temperatures? (Denise Reed, University of New Orleans)	Done
E-6-109	A	9	14	9	18	The sentence starting at " These impacts…" is too long. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Left unchanged as semicolons split the sentence up – but copy editor may change
E-6-110	A	9	22			Box 6.1 - this text is generally not well written (poor grammar, convoluted sentences, etc), is repetitive of earlier material and inconsistent with many	Agree. Box reworded

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						conclusions in earlier coral reef entries. Details below. (Paul Marshall, Great Barrier Reef Marine Park Authority)	
E-6-111	A	9	25	10	1	Box 6.1. One must be careful to not confuse reporting of bleaching with actual bleaching incidence and to give the impression that bleaching only started to appear in the early 1980s. There are earlier records by Glynn and early photographs (Savile Kent for instance) which appear to show bleached corals (Thomas Spencer, University of Cambridge)	Agree – reworded so that phrase added to say this, which is a point also made later in the chapter
E-6-112	A	9	27			line 27- high temperature or high UV alone can each cause bleaching, the implication that you need both is not exclusively true. (Lara Hansen, WWF)	Agree - reworded
E-6-113	A	9	27			add "normal" after "above" (Danny Harvey, Dept of Geography, University of Toronto)	Agree - reworded
E-6-114	A	9	29	9	29	No need for "nonetheless" in the sentence. The text should be simple. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Agree - reworded
E-6-115	A	9				Also should add a line about the listing of the Acroporid corals in the Caribbean due to three factors which can all be linked to climate change- increased temperatures, hurricanes and disease (Lara Hansen, WWF)	Agree. Caribbean component of material on reefs strengthened
E-6-116	A	10	0			It is important to note that the situation is not hopeless, the pressures on the reefs could be reduced significantly by (1) controlling over-fishing, (2) establishing 'no-take' protected fish breeding grounds in suitable areas and (3) encouraging reef regeneration by depositing structures on the sea bed. (Anthony Clayton, University of the West Indies)	Agree – this is covered in 6.4.1.5 – especially the Wooldridge et al 2005 ref
E-6-117	A	10	1	10	1	What is the spatial context referred to here? Global bleaching events? (Paul Marshall, Great Barrier Reef Marine Park Authority)	This question is now addressed with careful rewording, and by the revised Figure
E-6-118	A	10	1	10	51	Several researchers in the US Virgin Islands have work from the 2005 bleaching event that would be very good to add here. I believe it is in press. It shows a link between bleaching and disease. Very interesting stuff. Also good to add info from Mark Eakin's ReefWatch extreme 2005 temps in the region--exceeds maxima from a 20+ year data set. (Lara Hansen, WWF)	Agree – very helpful comment. Caribbean component of material on reefs strengthened to include this material which is also apparent from the revised Figure, compiled from ReefWatch (and Reefbase) data on website with help of Eakin
E-6-119	A	10	1			Indicate where the bleaching events mentioned occurred if they were not worldwide. (Denise Reed, University of New Orleans)	This question is now addressed by the revised Figure
E-6-120	A	10	7	10	8	While bleaching was extensive on the GBR in 1998 and 2002, there was minimal coral mortality. This qualifier is critically important and must be added, as it is in the following sentence.	Agree – point is now included several times in revised Box (map and comments)

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						(Paul Marshall, Great Barrier Reef Marine Park Authority)	
E-6-121	A	10	10			although the latter event caused minimal coral mortality'. No. In parts of the western IO, such as Seychelles, it caused substantial mortality of the corals. Suggest delete clause, or replace it with ' which led to substantial further mortality in some areas'. (Charles Sheppard, Warwick University)	Agree – text changed to reflect this
E-6-122	A	10	12			Clarify that only some of the stresses are climate related. (Denise Reed, University of New Orleans)	Agree – reworded, and this comes through in Coral reefs cross-chapter case study – especially in Fig 16.1
E-6-123	A	10	12			Add to end of sentence, after the brackets: 'with a particularly severe bleaching and mortality episode in the Eastern Caribbean in 2005'. (Charles Sheppard, Warwick University)	Done – see E6-118
E-6-124	A	10	15		16	later this century' implies late this century. Suggest change to ' within a very few decades' (Charles Sheppard, Warwick University)	Agree - reworded
E-6-125	A	10	17	10	19	Rephrase sentence. (Bhawan Singh, Universty of Montreal)	Done
E-6-126	A	10	17			more frequent bleaching seems inevitable'. True but add 'and mortality'. '...bleaching and mortality seems inevitable.' It is the mortality which really counts. (Charles Sheppard, Warwick University)	Important point – BLEACHING AND MORTALITY – adopted as progression here and in several other places in Coral reefs cross-chapter case study
E-6-127	A	10	19	10	21	There is a more thorough and accurate treatment of the potential for acclimation through swapping of zooxanthellae types in Box 4.5, Chapter 4, pg 36.Text in Box 6.1 should either not repeat the treatment of this issue, or at least be made consistent with the treatment in Box 4.5. (Paul Marshall, Great Barrier Reef Marine Park Authority)	Consistency discussed and addressed as part of Coral reefs cross-chapter case study
E-6-128	A	10	24	10	25	replace the second half of the sentence with something like the following, which is pasted directly from my own review of the subject (Harvey, 2006) that will soon be published in Climatic Change: "The critical issues concern (i) the rate at which such shifts can occur, (ii) the temperature limits of adaptation, and (iii) the occurrence of adverse tradeoffs in other areas (such as productivity) in exchange for greater temperature tolerance. Although there may be a substantial genetic ability for adaptation to warmer temperature, natural rates of adaptation are likely to be quite slow and will be further inhibited by other stresses on coral reefs, including reduced carbonate supersaturation in surface waters (Hughes et al., 2003; Hoegh-Guldberg, 2005). More temperature-tolerant symbionts are observed to have slower and less vigorous growth, because of the energetic cost of enhanced protective machinery	Agree – but space constraints obviously limit the extent to which these points can be included. They are addressed through the Coral reefs cross-chapter case study. The Box has been revised and now addresses these points and the Hoegh-Guldberg 2005 ref added

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						(Donner et al., 2005). This in turn would limit the reef's ability to keep up with rising sea level or to deal with other stresses (such as nutrient loading, sedimentation, and disease). With adaptation, it is conceivable that significant and widespread harm could be delayed until global mean temperatures exceed 2 K, although widespread harm has already been observed with just the present global mean warming of 0.8 C." Reference not already cited in Chapter 6: Hoegh-Guldberg, O.: 2005, 'Low coral cover in a high-CO2 world', J. Geophys. Res. 110, C09S06, doi:10.1029/2004JC002528. Source of excerpt: Harvey L D D 2006 Dangerous Anthropogenic Interference, Dangerous Climatic Change, and Harmful Climatic Change: Non-Trivial Distinctions with Significant Policy Implications Clim. Change (accepted) (Danny Harvey, Dept of Geography, University of Toronto)	
E-6-129	A	10	24	10	25	"…. But the time laps and the extent to which this threshold could increase……. remain very uncertain". (Yves Henocque, Department of Fisheries)	Agree – rewording addresses this
E-6-130	A	10	26	10	46	Which are the units/concepts assciated to the x- and y-axis in figure B6.1.2? (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Figure redrawn and now clear on this
E-6-131	A	10	48		50	This paragraph should not be split by the figure from the one before it. It make a very important point and in its current location it would be easily overlooked and people would be left with the previous statement as the most important. (Lara Hansen, WWF)	Agree – reworded box does not have split text – and nor should final page format
E-6-132	A	10	48			delete "that" (Danny Harvey, Dept of Geography, University of Toronto)	Done
E-6-133	A	10	49		50	have the potential to reduce…'. Change to 'already has reduced… cover and diversity 'in many recorded places'. (Charles Sheppard, Warwick University)	Agree – reworded text captures this point
E-6-134	A	11	2			The trends described here are for the climate drivers - this needs to be clear, currently it implies that trends of the coastal systems themselves will be described. Given the content of the next section some information about drivers other than water level changes should be included. Section 6.4 (the next one) appears to require an understanding of the changes in rate/magnitude/nature of all the drivers in Table 6.2 but section 6.3 doesn't cover them all other than very generally in the Table. One approach would be to, if possible, scale the changes in 6.2 other than relative to each other for the SRES storylines, e.g., compare them to some kind of current condition. This reviewer feels unprepared for the discussion in section 6.4 by what has gone before. (Denise Reed, University of New Orleans)	Agree – information on climate change scenarios greatly enhanced and quantified. However, some remarks (6.3.1) are non-climate drivers.

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E-6-135	A	11	8			insert reference to IPCC SRES report at the end of this line (Clair Hanson, IPCC TSU)	Agree
E-6-136	A	11	13	11	19	Section 6.3.1 is the first time that the socioeconomic scenarios A1, A2, B1, B2 are mentioned in this chapter. They should be defined/described at least briefly so that this section stands alone and the reader does not have to hunt through another chapter to find the definitions. (Donald Cahoon, Patuxent Wildlife Research Center)	Agree –explained better
E-6-137	A	11	18	11	19	The text should be simple: "Qualitative trends under the SRES scenarios are provided in table 6.1" (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Agree
E-6-138	A	11	21	11	24	Table 6.1: The table caption says that the trends are global, so no need to have "A1 world", "A2 world", etc, in the column title. Please make clear that columns 2-5 are the SRES scenarios, and that column 1 are the trends. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Agree
E-6-139	A	11	21			table 6.1: replace 'hazard management' with 'hazard risk management' as hazards are not very manageable, but vulnerability to hazards and the consequences of risks can be managed (Silvia Llosa, ISDR System)	Agree
E-6-140	A	11	22	11	23	It will be useful to elaborate SRES storylines in Table 6.1. "A1 World" (Globalised world/economic focus), "A2 World" (Regionalised world/economic focus) etc. (Rafiqul M. Islam, Integrated Coastal Zone Management Program)	Agree
E-6-141	A	11	27	11	31	Are there no examples outside of US/Europe?. More generally egs are biased towards US and Europe. (Ian Townend, HR Wallingford)	None that we know of -- their more limited development is emphasised.
E-6-142	A	11	30	11	30	Which is the name of the Schleswig-Holstein coastal risk assessment? (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Text deleted
E-6-143	A	11	30			The newest relevant work in this context has been published by Hans von Storch and his group. I find the following references important, though they do target to regionalize climate change effects to the North Sea, and are not directly connected with socio-economic scenarios. Grossmann, I., K. Woth and H. von Storch, 2005: Localization of global climate change: Storm surge scenarios for Hamburg in 2030 and 2085. (submitted) Woth, K., R. Weisse and H. von Storch, 2005: Dynamical modelling of North Sea storm surge extremes under climate change conditions - an ensemble study. Ocean Dyn. 56/1: 3-15, DOI 10.1007/s10236-005-0024-4 (Wilhelm Windhorst, Kiel University)	Agree – but beyond the chapter scope other than examples (which are already in Box 6.2). So not added.
E-6-	A	11	30			missing reference	Agree

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144						(Clair Hanson, IPCC TSU)	
E-6-145	A	11	31	11	42	Section 6.2.1. Natural coastal systems: I would advise referring to a paper on coastal steepening around the UK, which has demonstrated that 66% of the UK coast has steepened in recent years. The exact causes of this are a combination of pressures but the potential impacts of this for measuring/predicting the impacts of climate associated changes are very large indeed. Taylor, J.A., A.P. Murdoch and N.I. Pontee. A macroscale analysis of coastal steepening around the coast of England and Wales. The Geographical Journal 170(3): 179-188. (Larissa Naylor, Environment Agency & University of East Anglia)	Agree paper should be included, but in Section 6.2
E-6-146	A	11				T6.1 - perhaps order the table from highest to lowest emissions/projected T change so A1, A2, B2, B1? (Clair Hanson, IPCC TSU)	Disagree – A1 covers the full range of emissions – A1T, A1B and A1FI – these terms are now defined in text.
E-6-147	A	12	5	12	7	No need to put "(not 2100)" in the text. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Text deleted
E-6-148	A	12	8	12	11	Are there any estimates of the effects of sea-level rise in the Hulme et al (2000) study? What are the predictions? If not, then this passage is not a relevant information for the chapter. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Disagree – important methodological point which has been strengthened
E-6-149	A	12	8			Hulme et al reference not in the list (Denise Reed, University of New Orleans)	Agree
E-6-150	A	12	13	12	15	Table 6.2: The effects here are not clearly described. line 8-> Increased CO2 fertilization (Does this refer to land ecosystems?); Incresead ocean acidification, leading to decreased CaCO3 saturation; Reduction in coral calcification rates (for both warm and cold water corals). (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Text changed
E-6-151	A	12	14		15	table 6.2 second row. Again, change coral bleaching to coral mortality (which is the event that actually counts!) (Charles Sheppard, Warwick University)	Agree
E-6-152	A	12	17			replace "Rapid rises in sea level (>1 m/century)" with "Rapid and sustained rises in sea level (>1 m/century for several centuries)" (Danny Harvey, Dept of Geography, University of Toronto)	Not supported by WG1 – see new Box 6.6
E-6-153	A	12	17		18	capitalise the 'I' in Ice and Sheet on these two lines (Clair Hanson, IPCC TSU)	Text to new Box 6.6
E-6-154	A	12	18	12	18	West Antactic Ice Shelf (Bhawan Singh, Universty of Montreal)	Text to new Box 6.6
E-6-155	A	12	19	12	20	Replace the sentence beginning with, "This appears to be unlikely during the 21st century" with: "Either process could be triggered during this century, particularly if	Disagree – have looked at WG1 and produced new Box 6.6

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						global mean temperature warms more than 2-4 C, and could be irreversible once it started, leading to an eventual sea level rise of 7 m from Greenland alone and 5 m from West Antarctica alone over a period of a millenium or longer (See WG1, Chapter 10 Sections 10.7.4.2 and 10.7.4.3)" (Danny Harvey, Dept of Geography, University of Toronto)	
E-6-156	A	12	23			Do not use 'submitted' papers - Nicholls et al 2006b (Denise Reed, University of New Orleans)	Submitted papers will be published by spring 2007.
E-6-157	A	12		13		You mention acidification of ocean waters in several sections, and it might be useful to introduce this here in the scenarios section - and highlight it as an area where more research is needed to clarify what it might cause. You might also usefully indicate here that these climate drivers (and ARE they all drivers?... or are they in some cases knock-on effects of climate change which then DRIVE coastal change?) often may act synergistically to effect changes to coastal systems. Of, not even synergistically - but in combinations where we don't yet understand how they might interact. (Heather Viles, University of Oxford)	Agree – have strengthed this issue here – but downplayed later as so little is known. Also see 6.2.5 where it is mentioned.
E-6-158	A	12				Table 6.2: Storm track frequency - Add "Potential re-orientation of beaches and other geomorphological features, as a result of changing wind and wave directions at the coast". (Ian Townend, HR Wallingford)	Agree
E-6-159	A	13	15			This box doesn't really include scenarios, just examples, and has no mention of impact (except the roads on the Cairns map which do not show well) and adaptation analysis. The information is useful but would be better if the contribution of storms and sea-level could be seen or identified separately. Or maybe only the Bay of Bengal example includes both - the text is ambiguous. (Denise Reed, University of New Orleans)	Modified but retained Box as Chapter Team felt these examples were important and we have been asked to increase examples. Also makes point about effects other than SLR.
E-6-160	A	13	15			Box 6.2 - The figures in this box should have a "general" continent-map to indicate where these regions are located (Asia, Europe, Australia). There is no reference in the text to figure B6.2.2. in lines 29-31. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Agree – but no space
E-6-161	A	13	24		25	is this explanation of the models necessary? If so then state what climate change scenarios the models are diriven with (Clair Hanson, IPCC TSU)	Text changed
E-6-162	A	13	29		30	what is meant by - the increase is positive? (Clair Hanson, IPCC TSU)	Text changed
E-6-163	A	13	29		31	Fig B6.2.2 should be referenced here (Clair Hanson, IPCC TSU)	Agree

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E-6-164	A	13	36		51	The figure is probably only for those people illustrative who are accustomed to read model outcomes, some additional expananition would increase ist accessibility. (Wilhelm Windhorst, Kiel University)	Figure retained as alternative presentations not available.
E-6-165	A	14	32	31	20	Reduce to within 14 pages (Qilun Yan, National Marine Environmental Monitoring Center)	Disagree – against Chairs recommendations
E-6-166	A	14	37		38	saying what comes next is always unnecessary. Save the space (unless it is your policy throughout). (Charles Sheppard, Warwick University)	This is our policy throughout.
E-6-167	A	14	41			Section 6.4.1 does not mention impacts on wildlife (including ecologically dominant species and breeding birds) (Silvia Llosa, ISDR System)	We have added a new subsection on impacts to biodiversity.
E-6-168	A	14	45	14	45	needs to be cross-checked against chapter 1, page 30. One might report 'Over the last century, 67% of the eastern coastline of the UK has experienced a landward retreat of the low-water mark (Taylor et al. 2004)'. Taylor JA, Murdock AP and Pontee NI 2004 A macro-scale analysis of coastal steepening around the coast of England. Geographical Journal 170: 177-188. (Thomas Spencer, University of Cambridge)	This example was added to this section as suggested by the reviewer.
E-6-169	A	14	49	14	49	Format: Bruun (1962) was... (Bhawan Singh, Universty of Montreal)	Sentence was reworded.
E-6-170	A	14		16		Section 6.4.1.1 - there are very few examples in this section/indeed specific about future impacts. Are there no site specific studies that can be cited here? (Clair Hanson, IPCC TSU)	We have added new site specific studies.
E-6-171	A	14				Fig B6.2.3 - what scenario? (Clair Hanson, IPCC TSU)	
E-6-172	A	15	5	15	12	The references cited assume that the inlet systems are fixed in space. Allen (1990) provided evidence for marine transgression on the Severn estuary. Townend and Pethick (2002) explored the concept of mass balance under a process of transgression (equivalent to a 3-D version of the Bruun rule for beaches). A system free to trangress does not necessarily have an a priori sediment demand. However, systems that are constrained and forced to "warp-up" in-situ need sediment to keep pace with sea level rise. It has been suggested that Holocene sediments on the shelf around the UK have largely been reworked and as a consequence of offshore supply to the coast is now extremely limited (Orford and Pethick, 2006). Hence the lack of supply in conjunction with constraints (geological or anthropogenic) may give rise to a sediment demand and if this is not met the system begins to drown in-situ (which will be evident as erosion, but should not be confused with erosion around the mouth of an inlet/estuary due to landward transgression).	The concept of marine transgression along estuarine and Pethic's mass balance approach was picked up in section 6.3. Orford refernce added later in this section.

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						(Ian Townend, HR Wallingford)	
E-6-173	A	15	5			is this indirect and less- appreciated? Look at all the towns and villages with harbours now inland, or now submerged. Change to 'Another…' (Charles Sheppard, Warwick University)	"less appreciated" was removed
E-6-174	A	15	14	15	18	Nothing new and largely aspirational rather than a finding. (Ian Townend, HR Wallingford)	Paragraph deleted.
E-6-175	A	15	14		17	does this para actually say anything? (Charles Sheppard, Warwick University)	Paragraph deleted.
E-6-176	A	15	16	15	18	There is information lacking in this passage: Which "wide" range of scales? Temporal scale? Spatial scale? How wide would they be? What does Cowell et al conclude in their study? Which type of approach was used in their study? (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Paragraph deleted.
E-6-177	A	15	18	15	18	practice (Bhawan Singh, Universty of Montreal)	"Practise" deleted.
E-6-178	A	15	18			omit ' and is elaborated below' and save a line! (Charles Sheppard, Warwick University)	The reviewer comment belongs to line 19 on page 16. We have deleted phrase "and is elaborated below".
E-6-179	A	15	20	15	22	As a general statement, this statement is completely indefensible! To make the sentence defensible, after "rates" add "for modest sea level rises (up to 1 m or perhaps more, depending on location)". After the sentence, add "However, for the large sea level rise that would occur with collapse of the West Antarctic Ice Sheet and Greenland Ice Cap (1 m/century for several centuries, with an eventual sea level rise of up to 10 m or more), beach defenses at some point will become futile" (Danny Harvey, Dept of Geography, University of Toronto)	Sentence was revised to relfect that we are talking about the rates of sea level chnge projected by the IPCC.
E-6-180	A	15	25	15	26	This Stone et al is a very weak reference for this point. Suggest Stone and McBride in JCR 1998. (Denise Reed, University of New Orleans)	Stoane and McBride (1998) added.
E-6-181	A	15	28	15	32	It is good to see some reference to gravel systems in here. Can some mention of relaxation times (or even thresholds??) be included to point to some of the differences in process-repsonse between these and sandy systems described previously. (Denise Reed, University of New Orleans)	Threshhold concept added with reference.
E-6-182	A	15	30	15	30	Insert period before The persistence… (Bhawan Singh, Universty of Montreal)	Done.
E-6-183	A	15	30			full stop before 'The persistence' (Clair Hanson, IPCC TSU)	Done.
E-6-	A	15	34	16	4	This section needs some more development and some re-working, both in general	Section reworded as suggeseted and

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184						terms and with more of a focus on likely impacts of climate change. It needs to acknowledge different types of cliff failure and differing relations between subaerial and marine processes for different cliff types (working in the SCAPE material more effectively). Whilst basal marine processes may provide the trigger that then propagates change through the whole cliff profile, in other instances the vast majority of cliff processes are best described as a set of subaerial hillslope processes. As such, there needs to then be some consideration of likely future soil - vegetation changes on coastal cliffs. As an example of thinking through climate change effects, many years ago JN Hutchinson showed a strong correlation between rockfall and retreat of chalk cliffs and air temperature records, cliff failure being a result of freeze thaw cycles. So it should be possible to make some inferences here about changing climate and changing rates of cliff retreat. And it is 'quiescence' not 'quintessence'! (Thomas Spencer, University of Cambridge)	Hutchinson reference added.
E-6-185	A	15	46	15	46	The word quintessence should be quiessence. (Donald Cahoon, Patuxent Wildlife Research Center)	Done.
E-6-186	A	16	1	16	4	The point about cliff recession and sediment supply to adjacent systems is an important one. The citations here however seem to be 'in press' grey literature, not widely accessible. Is this really the only example we can use. Perhaps linking the results of the new model to older sediment budgets (published) of the East Anglian coast that infer these relationships in general terms. The reference to the Bruun Rule here is very out of place - why would we expect as sandy shoreline ruile to apply to cliffed coasts, and if the text is referring to the beaches fed by cliffs then it seems obvious that the Bruun rule (2-D) would not apply. It is good to see this discussion of cliffs though linking it more directly to overal sediment budgets (as I suggest) would be even better! (Denise Reed, University of New Orleans)	Most of these references are journal articles. Reference to Bruun model deleted.
E-6-187	A	16	3	16	4	The Bruun model does not suggest a rate. It is just a form ratio and the rate is determined by sea level rise. The statement implies that the form of the shoreface is changing, or that other processes are also present (eg alongshore drift). Evidence for the Holderness coast presented by Wingfield and Evans (1998) and Balson et al (1998) suggests that the erosion of the shoreface has maintained a consitent form. (Ian Townend, HR Wallingford)	Reference to Bruun model deleted.
E-6-188	A	16	8	16	12	Delta classfication by wave-, tide- and river-dominence was put forward in 1970s and has been included in many text books. It is too general and is suggested to be deleded. (Congxian Li, Tongji University)	We disagree that this classical grouping of deltaic landforms is outdated.

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E-6-189	A	16	16	16	19	This passage is describing what comes in the next paragraph. It should be the introduction to the paragraph starting at line 21. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Done.
E-6-190	A	16	16	16	16	space after realm (Woodroffe…) (Bhawan Singh, Universty of Montreal)	Done.
E-6-191	A	16	21	16	28	The lost of coastal marshes between 1978 and 2000 is not only due to the factors mentioned, altered is a main factor. This can mean more than just increased water levels (this implies depth of flooding). Duration of flooding is also important (not only due to rising sea-levels). Suggest using the term altered hydrology or alterations in tidal flow patterns. Also - the paragraph refers to the Mississippi Delta Plain but some of the figures mentioned are for the entire Louisiana coast (including the Chenier Plain). Check the numbers. Also these numbers likely include barrier islands and swamp forests, not just intertidal marshes. Either get values just for the delta plain or just for marshes or adjust the terminology appropriately. Also the Barras report is a projection not a prediction (not semantics in this case as it simply projects current trends) and the report has no basis to predict the magnitude of future change if sea-level rise accelerates. I suggest, as an author of the report, that it does NOT project 'significant additional losses' as implies in this text. See page 33 of Barras et al for the text on climate change. (Denise Reed, University of New Orleans)	Paragraph revised as folows: Only wetland losses in the Mississippi River Delta plain are now included. Changed "prediction" to "projection. Changed to clarify that projections of future wetland loss "do not consider a potential acceleration of sea-level rise".
E-6-192	A	16	25			under which scenarios? (Clair Hanson, IPCC TSU)	Paragraph altered so that a specific scenario is not needed.
E-6-193	A	16	27	16	27	Remove semi colon : additional ; losses (Bhawan Singh, Universty of Montreal)	Sentence no longer has semicolon.
E-6-194	A	16	33	16	33	Change "the Yangtze River delta" into the Changjiang River delta. (Congxian Li, Tongji University)	Done.
E-6-195	A	16	43			replace "destruction" with "dimunition"? (Ian Townend, HR Wallingford)	Done.
E-6-196	A	16	51	16	51	Replace the word 'abstraction' with 'extraction'. (Donald Cahoon, Patuxent Wildlife Research Center)	"Abstraction" deleted.
E-6-197	A	17	0			It has been argued that in situations where the area of intertidal environments has been reduced by embanking and reclamation but the cross-sectional area of the estuarine channel has remained largely unchanged, the frictional dissipation of tidal energy is reduced and the more rapid passage of the flood tide leads to increased estuarine tidal range and higher flood current velocities. Constrained by fixed defence lines and unable to retreat landwards, remaining mudflats experience surface lowering, accompanied by saltmarsh lateral retreat and internal dissection.	New paragraph (Section 6.4.1.3.) has been added to decribe how esturarine mudflats respond to changes in tidal hydrodynamics.

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						Expected sea level rise is likely to increase lowering and loss rates as greater water depths will further alter estuarine tidal hydrodynamics and associated morphological responses, allowing larger waves to propagate further onshore. (Thomas Spencer, University of Cambridge)	
E-6-198	A	17	1	17	1	It should be the chapter 10,rather than chapter 11. (Congxian Li, Tongji University)	Corrected to read “Chapter 10”.
E-6-199	A	17	3	17	3	Delete the word 'the' so the sentence reads "…sediment delivered to it's delta …." (Donald Cahoon, Patuxent Wildlife Research Center)	Done.
E-6-200	A	17	3			remove 'it's' (Clair Hanson, IPCC TSU)	Sentence corrected.
E-6-201	A	17	10	17	10	replace the verb 'not blocked' with 'removed' (Donald Cahoon, Patuxent Wildlife Research Center)	Sentence corrected.
E-6-202	A	17	15	17	29	Line 15 introduces the concept of mixing but this separated from the actual text on resdience time beginning on line 22. Move sentence beginning on line 15 to start of next paragraph. Changes in gravitational circulation can have ecological implications. There may not be space to discuss them here but it would seem that some of the work in San Francisco Bay (Jassby, Kimmerer etc) on changes due to freshwater inflow could illustrate the ecological consequences well. (Denise Reed, University of New Orleans)	We have expanded the disucssion of impacts on phytoplankton to include temperature effects, so this paragraph should be separate from the prior paragraph that focuses on fresh water delivery.
E-6-203	A	17	31	17	33	The sentence starting at "One consequence…" is not clear. An example: "Increasing atmospheric CO2 uptake decreases seawater pH and carbonate saturation (Andersson et al 2003)." (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	The sentence has been reworded for clarification.
E-6-204	A	17	31	17	33	Rewrite sentence (Bhawan Singh, Universty of Montreal)	Done.
E-6-205	A	17	32	17	32	revise sentence to read: 'increased uptake of CO2 is lower pH…' (Donald Cahoon, Patuxent Wildlife Research Center)	The sentence has been reworded for clarification.
E-6-206	A	17	34	17	34	Delete a 'that". (Congxian Li, Tongji University)	Done.
E-6-207	A	17	39	17	39	On line 36 these consequences are decsribed as import - can they be so described if they have not been quantified….? (Denise Reed, University of New Orleans)	Line 39 has been deleted.
E-6-208	A	17				6.4.1.3 - again only a very few examples and these only present themselves after a page of text (Clair Hanson, IPCC TSU)	Another site specific example has been added (Dutch Waddensea)
E-6-209	A	18	8	18	16	This material could do with some improvement. And it might be helpful to re-organise it towards the beginning of this section. I think that the key arguments here	Accepted, this paragraph was reorganized and new material added .

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						are as follows: in situations where the area of intertidal environments has been reduced by embanking and reclamation but the cross-sectional area of the estuarine channel has remained largely unchanged, the frictional dissipation of tidal energy is reduced and the more rapid passage of the flood tide leads to increased estuarine tidal range and higher flood current velocities. Constrained by fixed defence lines and unable to retreat landwards, remaining mudflats experience surface lowering, accompanied by saltmarsh lateral retreat and internal dissection. Expected sea level rise is likely to increase lowering and loss rates as greater water depths will further alter estuarine tidal hydrodynamics and associated morphological responses, allowing larger waves to propagate further onshore. There are also issues of changing flood and ebb dominance in estuaries (Dronkers and otheres...) which might be addressed also. (Thomas Spencer, University of Cambridge)	
E-6-210	A	18	11	18	11	Bruun again. Given that the Bruun principle addressed by Pethick is about morphological response to sea-level rise rather than the rates that you associate with Bruun on pages 14-15, I think this needs amplification. Even though Pethick atttributes the principle to Bruun, you have not yet described that principle the way Pethick does. Either remove reference to Bruun and describe Pethick's approach as landform migration (the term he uses), or describe more fully, here or earlier, Bruun's thesis. (Denise Reed, University of New Orleans)	The sentence was revised to clarify Pethick's use of the Bruun principle.
E-6-211	A	18	11			Allen (1990) provided evidence for marine transgression on the Severn estuary. Pethick (2001) presented this as the rollover concept. Townend and Pethick (2002) considered this in the context of mass balance which is equivalent to the the Bruun principle in 3-D. (Ian Townend, HR Wallingford)	Reworded sentence to reflect "rollover" concept as applied to estuarine shorelines by Pethick..
E-6-212	A	18	12			Please check, if 6 mm is the right value. (Wilhelm Windhorst, Kiel University)	This is a standard sea-level rise guidance value in the UK
E-6-213	A	18	16	18	20	This makes the Venice laggon situation seem to be simply a matter of vertical changes in water level. Recent assessments indicate a complex interaction between waves, erosion and biota resulting the erosion of mudflats. Cecconi (in Fletcher and Spencer 2005) refers to the lagoon as getting deeper (due to slr and subsidence) and flatter (due to sediment dynamics, waves, erosion etc). Others may have published in more detail on this or there may be more recent detailed summaries by Cecconi and others. (Denise Reed, University of New Orleans)	Paragraph was revised to convey these complexities.
E-6-	A	18	16	18	20	The inference here is that the changes in the Venice lagoon are the result of 'natural'	Paragraph was revised to indicate that human

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214						processes. But there have been ongoing modifications of the tidal inlets (jetty construction, dredging), the lagoon itself (artificial channels, fish farm enclosures, land reclamation and most recently mechanised fishing) and the rivers entering the lagoon (major diversions) since the time of the Venetian Republic. See chapters in Fletcher CA and Spencer T (eds) 2005. Environmental Challenges to Venice and its lagoon (CUP) (Thomas Spencer, University of Cambridge)	modifications of the tidal inlets and sediment dynamics are contributing factors.
E-6-215	A	18	30	18	43	Suggest that the term 'shallow subsidence' needs definition if it is to be used. Given the content of the paragraph I think it can be removed and the term accretion and elevation change used alone. Otherwise this term will be confusing with the more common use of subsidence throughout the rest of this chapter. Also - it may not be clear to many why elevation doesn't equal accretion. Unless there is room to amplify this I suggest a more limited or generalised report of the findigns of these papers. (Denise Reed, University of New Orleans)	Done, "shallow" was deleted.
E-6-216	A	18	32	18	32	analysis suggests… (Bhawan Singh, Universty of Montreal)	Done.
E-6-217	A	18	40	18	43	These two sentences should be replaced with the following text: Cahoon (2003, and accepted) analyzed the elevation responses from a variety of hurricane-influenced coastal settings and found that a storm can simultaneously influence both surface and subsurface soil processes. This means that the net outcome on soil elevation is not always predictable solely from observed storm effects on sediment deposition and erosion. (Donald Cahoon, Patuxent Wildlife Research Center)	Done.
E-6-218	A	18	40	18	40	The correct citation is Cahoon, D. R. 2003. Storms as agents of wetland elevation change: their impact on surface and subsurface sediment processes, Proceedings of the International Conference on Coastal Sediments 2003. May 18-23, 2003, Clearwater Beach, FL, USA. CD-ROM Published by World Scientific Publishing Corp. and East Meets West Productions, Corpus Christi, Texas, USA. ISBN 981-238-422-7. An updated version of this paper has just been accepted for publication, and should also be cited at this point. Full citation: Cahoon, D. R. accepted. A review of major storm impacts on coastal wetland elevations. Estuaries and Coasts (Special Issue on Hurricanes). (Donald Cahoon, Patuxent Wildlife Research Center)	Done, new reference added.
E-6-219	A	19	7	19	9	Mention threshold rates of sea level rise at which marshes would not be able to keep pace with SLR. (Vivien Gornitz, Goddard Institute for Space Studies)	A sentence about thresholds at which marshes are inundated was added.

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E-6-220	A	19	10	20	45	Section 6.4.1.1 Beaches, rocky shorelines and cliffed coasts. At present, this section is heavily biased towards the responses of physical systems (i.e. geomorphology, morphodynamics and hydrodynamics) to climatic variability and change, to the relative exclusion of other important aspects of natural system responses such as those of organisms and ecosystems. As such, I strongly feel that this section needs to be revised to include consideration of the biological and ecological effects of climatic change that are being measured and predicted. I have provided a number of papers for the authors of chapter 6 to consider including in this section; most of which stem from an UK-wide partnership project. These papers can also serve to illustrate the benefits and necessity of long-term data for detecting climate change. This point needs to be more forcefully made in the chapter, as without long-term datasets at a national scale, the evidence-base for species responses to climatic change would be far weaker. ROCKY SHORE INVERTEBRATES (GENERAL TO SPECIFIC) Helmouth, B., N. Mieszkowska, P. Moore and S.J. Hawkins. (in press, 2006) Living on the edge of two changing worlds: forecasting the responses of rocky intertidal ecosystems to climate change. Annual Review of Ecology, Evolution and Systematics. 37: XXXX. A. ROCK COASTS. FISH. Genner, M.J., Sims, D.W., Wearmouth, V.J., Southall, E.J., Southward, A.J., Henderson, P.A., Hawkins, S.J., 2004. Regional climatic warming drives long-term community changes of British marine fish. Proceedings of the Royal Society of London, Biological Sciences, 271, 655-661. Mieszkowska, N, Kendall, M. A., Hawkins, S. J., Leaper, R., Williamson, P., Hardman-Mountford, N. J. & Southward, A. J. (In Press). Changes in the range of some common rocky shore species in Britain - a response to climate change? Hydrobiologia. Kendall, M. A., Hawkins, S. J., Burrows, M.T. & Southward, A. J. (2004). Predicting the effects of marine climate change on the invertebrate prey of the birds of rocky shores. Ibis (Special Edition) 146, 40-47. Simkanin, C. S., Power, A. M., Davenport, J., Myers, A. A., McGrath, D. (2003). Monitoring intertidal community change in a warming world. The Irish Scientist 2003 Yearbook May 2003. Samton Limited. Herbert, R.J.H., Hawkins, S.J., Sheader, M, Southward, A.J. (2003). Range extension and reproduction of the barnacle Balanus perforatus in the eastern English Channel. Journal of the Marine Biological Association of the UK, 83, 73-82. GENERAL Hiscock, K., Southward, A. J., Tittley, I. & Hawkins, S. J. (2004). Effect of changing temperature on benthic marine life in Britain and Ireland. Aquatic Conservation 14, 333-362. Hawkins, SJ, Southward, A.J., Genner M.J.	A new subsection on biodiversity impacts was added to section 6.4.2.

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						(2003). Detection of environmental change in a marine ecosystem--evidence from the western English Channel. Science of the Total Environment, 310,245-56. OTHER MARINE ORGANISMS: Sims, D.W., Genner, M.J., Southward, A.J. & S.J. Hawkins, 2001. Timing of squid migration reflects North Atlantic climate variability. Proceedings of the Royal Society of London - Series B 268: 2607-2611. Sims, D.W., Wearmouth, V.J., Genner, M.J., Southward, A.J., Hawkins, S.J., 2004. Low-temperature-driven early spawning migration of a temperate marine fish. Journal of Animal Ecology 73, 333-341. Benefit and necessity of long-term monitoring. Southward, A .J., Langmead, O., Hardman-Mountford, N. J., Aiken, J., Boalch, G. T., Dando, P. R., Genner, M. J., Joint, I., Kendall, M. A., Halliday, N. C., Harris, R. P., Leaper, R., Mieszkowska, N., Pingree, R. D., Richardson, A. J., Sims, D. W., Smith, T., Walne, A. W. and Hawkins, S. J. (2005). Long-term oceanographic and ecological research in the western English Channel. Advances in Marine Biology 47, 1-105. Thompson R.C., Crowe, T.P, Hawkins, S.J. (2002). Rocky intertidal communities: past environmental changes, present status and predictions for the next 25 years. Environmental Conservation. 29 (2) 168-191. (Larissa Naylor, Environment Agency & University of East Anglia)	
E-6-221	A	19	14	19	16	On line 14, insert 'models predict that' even sediment…. This paper includes case studies of two local areas and there are many uncertainties in the models. As there is no room to amplify everything just making it clear that this starement is based on model results will be best. (Denise Reed, University of New Orleans)	Inserted “some” before the words “rapildy subsiding marshes” to indicate that these results may not apply to all locations within the Mississippi Delta.
E-6-222	A	19	18	19	36	This paragraph should include a description of the influence of groundwater flux on the shrink-swell of mangrove soils and associated changes in soil elevation. This description should cite Whelan et al. 2005, Rogers et al. 2005. The full citation for Rogers et al. is given in comment # 6 above. (Donald Cahoon, Patuxent Wildlife Research Center)	There is not enough space to describe thse shrink-swell soil chanacteristics.
E-6-223	A	19	18	19	21	As in many parts of the chapter, the risks and seriousness of long term sea level rise are downplayed. After "(Saenger, 2002)", add something like " However, it is unlikely that many mangrove forests can shift inland in order to adapt to a sustained sea level rise of 1m/century over several centuries, such as would accompany collapse of the Greenland Ice Cap and West Anarctic Ice Sheet, processes that could be triggered this century with global mean warming of as little as 2-4 C (See WG1, Chapter 10, Sections 10.7.4.2 and 10.7.4.3)". (Danny Harvey, Dept of Geography, University of Toronto)	Done.
E-6-	A	19	19	19	21	The sentence "Mangrove communities…" is not clear. It would be better: Climate	We feel that the sentence was clear as worded.

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224						change and sea-level rise are likely to have positive (e.g. higher atmospheric CO2 and higher temperatures) and negative (increased salinity etc) effects in mangrove communities...". (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	
E-6-225	A	19	21	19	24	The sentence "The response…" is too long. Do you mean that all research/modelling studies have been only directed to salt marshes? It should be clearer when the sentence is re-written. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	A couple of the references were eliminated to shorten the sentence.
E-6-226	A	19	21	19	24	However, coastal forest losses in western Florida have been attributed to storm damage and drought. Their inability to recover is believed to be due to increasing salinity and greater frequency of tidal flooding due to sea level rise. See: Williams, K., et al., 1999. Sea level rise and coastal forest retreat on the west coast of Florida, USA, Ecology, 80 (6), 2045-2063, and Williams, K., et al., 2003. Interactions of storm, drought, and sea-level rise on coastal forest: a case study. J. Coastal Research, 19, 1116-1121. (Vivien Gornitz, Goddard Institute for Space Studies)	We refer to the effects of sea level rise and the results of Williams *et al.* (2003) in the next paragraph.
E-6-227	A	19	26			Sediment is not going to be available if it is consolidated. Availability of suspended sediment? Or availability of sediment for deposition? (Denise Reed, University of New Orleans)	The word "unconsolidated" was removed before the word "sediment.
E-6-228	A	19	28	19	31	"Mangroves are able…, BUT collapse of peat occurs…" (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	"but" was inserted as suggested by this reviewer.
E-6-229	A	19	31	19	33	Please avoid using semi-colon. Start a new sentence with "Hence…". (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Done.
E-6-230	A	19	31	19	31	Insert at the end of this sentence the following phrase: after Hurricane Mitch (Cahoon et al. 2003) and after lightning strikes (Sherman et al. 2003 and Whelan 2005). Sherman et al. is published in the Journal of Ecology and Whelan 2005 is a dissertation by Kevin R. T. Whelan, Florida International University. I will send the full citations when I return to the U. S. after July 24, 2006. (Donald Cahoon, Patuxent Wildlife Research Center)	References to Cahoon *et al.*, 2003 and Sherman et al, 2003 were added. We did not insert the reference to the Whelan dissertation because it was not needed in addtion to the Sherman article.
E-6-231	A	19	36	19	36	Delete this line, and end the sentence after 5 mm per year. Then add this sentence: "However, elevation change is only 1 mm per year because of 4 mm per year of shallow subsidence, indicating that many mangrove forests are experiencing an elevation deficit in relation to current sea-level rise (Cahoon et al. in press)." (Donald Cahoon, Patuxent Wildlife Research Center)	Done.
E-6-232	A	19	42	19	42	add the phrase "in salt marshes" to the end of this line. (Donald Cahoon, Patuxent Wildlife Research Center)	Disagree. It would not make sense to add the words "salt marshes" here.
E-6-	A	19	45	19	45	The correct spelling is Taxodium disticum.	Spelling was corrected.

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233						(Donald Cahoon, Patuxent Wildlife Research Center)	
E-6-234	A	19	45			Unless a more specific reference for slr and cypress loss in Louisiana can be identified I suggest this is removed. Connor and Day for example? (Denise Reed, University of New Orleans)	Conner *et al.* and Allen *et al.* articles refereneces were added to support this statement
E-6-235	A	19	48	19	49	Please avoid using semi-colon. Use "and" to link the sentences. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Done.
E-6-236	A	20	1	20	5	The sentence "Increases in the amount…" is too long. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Disagree.
E-6-237	A	20	14		15	change 'Reefs appear to…' to 'Reefs have…' (Charles Sheppard, Warwick University)	Done
E-6-238	A	20	14		36	6.4.1.5 this could be reduced as much of it has already been covered in S6.2.5 and B6.1 (Clair Hanson, IPCC TSU)	This is part of Coral reef cross chapter case study. Earlier material addresses Thresholds and Observed Effects and differs from 6.4.1.5
E-6-239	A	20	16			increased frequency AND SEVERITY (Charles Sheppard, Warwick University)	Done
E-6-240	A	20	16			I recommend tho include the following reference, as this work is a sound compilation of material about the possibilities and needs to change management in the catchment to achieve sustainability of the Great Barrier Reef Productivity Commission 2003, Industries, Land Use and Water Quality in the Great Barrier Reef Catchment, Research Report, Canberra, ISBN 1 74037 113 5, Media and Publications, Productivity Commission Locked Bag 2 Collins Street East, Melbourn VIC 8803, 415 p. (Wilhelm Windhorst, Kiel University)	This is not widely available and we have adequate refs on coral
E-6-241	A	20	18	20	19	This needs to be updated in the context of the recent (2006) mass-bleaching event that has caused substantial coral mortality to Caribbean reefs. (Paul Marshall, Great Barrier Reef Marine Park Authority)	It was a 2005 event in Caribbean, and this is now discussed in detail in Box 6.1 with revised figure that shows this
E-6-242	A	20	19	20	20	This suggestion, that deterioration of Pacific reefs is mostly due to bleaching, is not entirely accurate. Firstly, Indian Ocean reefs have generally suffered more severe damage from bleaching-induced mortality than have Pacific reefs, and secondly, many Pacific reefs have suffered significant damage from non-climate stresses such as pollution and destructive fishing. (Paul Marshall, Great Barrier Reef Marine Park Authority)	This has also been clarified, with new additional material, in Box 6.1
E-6-243	A	20	19			Pacific AND INDIAN OCEAN reefs (Charles Sheppard, Warwick University)	This has been clarified, with new additional material, in Box 6.1
E-6-244	A	20	21			add sentence: The Indian Ocean suffered the greatest mortality of all. (Charles Sheppard, Warwick University)	This has also been clarified, with new additional material, in Box 6.1
E-6-	A	20	23			of short duration'? Difficult: is 2 months short??	This is part of the Coral reef cross chapter

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245						(Charles Sheppard, Warwick University)	case study and the issue is covered consistently and adequately in Box 4.5 and Box 6.1
E-6-246	A	20	24	20	26	Coral bleaching associated with the 1998 El Nino event affected reefs globally, not just Indo-Pacific region. (Paul Marshall, Great Barrier Reef Marine Park Authority)	Coral reefs do not occur globally, so we have chosen not to use that term. The issue is well illustrated by the new map in Box 6.1
E-6-247	A	20	30	20	33	The sentence "However…" has too many repeated "and". Why not split it in shorter sentences to improve the readability? (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Sentence has been split
E-6-248	A	20	42	20	43	Please avoid using semi-colon. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Copy editor issue
E-6-249	A	20	42	20	43	Mention threshold rates of sea level rise at which coral reefs would not be able to keep pace with SLR. Different types of coral will have different responses. Some species will be able to keep up, others may not. (Vivien Gornitz, Goddard Institute for Space Studies)	Disagree. The issue is whether reefs can keep up, not individual corals. The text has been modified slightly to clarify meaning
E-6-250	A	21	2	21	6	The sentence "There is limited…" is too long. It could be split in shorter sentences. Please avoind using semi-colon. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Done
E-6-251	A	21	2	21	2	result in an increase… (Bhawan Singh, Universty of Montreal)	Done
E-6-252	A	21	3		4	I believe there is evidence of extension south along the Indian ocen coast of Durban too. Prof Mike Schleyer, Durban. Can get info if wanted. (Charles Sheppard, Warwick University)	An additonal reference – Ayre and Hughes – has been added here, but space does not permit us to extend discussion to Durban
E-6-253	A	21	22	21	23	climate variability should be highlighted in this connection (Silvia Llosa, ISDR System)	Addressed. 'Climate variability' is included in the paragraph.
E-6-254	A	21	26	21	26	(2) could include changes in frequency and magnitude of extreme weather events, storm surges, cyclones… (Silvia Llosa, ISDR System)	Addressed. 'Extreme weather events, storm surges, cyclones' are included in the sentence.
E-6-255	A	21	29	21	29	Please avoid using semi-colon. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Addressed.
E-6-256	A	21	32	21	33	Table 6.3: One should use more "contrasting" signs for the impacts (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Addressed. Clearer symbols used.
E-6-257	A	21	32			This Table needs to show which are positive and which are negative or if it can be either way. (Denise Reed, University of New Orleans)	Good suggestion but not enough data to indicate positive and negative impacts. The table has been revised to show strong, weak, and negligible or not established impacts and be consistent with the discussion in the text.

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E-6-258	A	22	4	22	4	…the magnitude.. (Bhawan Singh, Universty of Montreal)	Addressed.
E-6-259	A	22	30	22	31	Rewrite sentence (climate change in climate…) (Bhawan Singh, Universty of Montreal)	Addressed. Sentence has been reconstructed.
E-6-260	A	22	30	22	34	Not very clear what the point is. (Miltiadis Seferlis, Greek Biotope Wetland Centre)	Ditto.
E-6-261	A	22	30	22	31	Climate change in climate? Need rephrase. (Miltiadis Seferlis, Greek Biotope Wetland Centre)	Ditto.
E-6-262	A	22	30			I believe that the reference to section 6.2.1 is wrong, as this section is only dealing with ecological and geomorphological issues. (Wilhelm Windhorst, Kiel University)	Addressed. Corrected to Section 6.2.2.
E-6-263	A	22	30		31	change to --> climate change, directly or indirectly, … (Clair Hanson, IPCC TSU)	Addressed. As in E-6-259.
E-6-264	A	22	31			omit 'in climate' (Peter Saenger, Southern Cross University)	Ditto.
E-6-265	A	22	36	23	15	As these sections are not very concise, they could be omitted. Especially as table 6.3 is discussed in the following sections. (Wilhelm Windhorst, Kiel University)	N.A. As part of the introduction in Section 6.4.2 these three paragraphs provide some generalizations of what we know since the TAR and some key points to take note when examining the different sectors below.
E-6-266	A	22	39	22	40	Why do you assign low probability to the collapse of the WAIC and GIS? The only thing that the science indicates to be of low probability is for it to occur this century, but the science indicates a very high probability of it being triggered with only 2-4 K global mean warming. My comment pertaining to page 12 (Section 6.3.2) requests revised wording to reflect this distinction (incidentally, the reference to section 6.2.3 should be to Section 6.3.2). To hopefully convince potentially skeptical authors of this chapter, I am pasting year my own review of this matter, lifted from a paper of mine (Harvey, 2006) about to be published in Climatic Change: "Computer simulations by Huybrechts and de Wolde (1999) indicate that a net loss would occur with a regional warming of about 3 K, and that an 8 K warming would cause near-total melting by A.D. 3000. These results were obtained assuming an annually uniform warming. The GIS is likely most sensitive to summer temperatures, and summer warming is likely to be less than the annual mean warming. This in turn implies that the required mean annual warming is somewhat greater than 3 K (given the various uncertain parameterizations in the Huybrechts and de Wolde model). It is unclear what global mean warming would be associated with a given regional warming over Greenland. In some coupled	Addressed. Sentence has been modified to recognize the issue of the WAIS and GIS and to cite the publication when it is available. See new Box 6.6

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						atmosphere-ocean GCMs the regional warming over Greenland is much more than the global mean warming, while in others it is comparable to the global mean warming (the normally large high latitude warming being reduced in the North Atlantic sector due to changes in the North Atlantic current) (Harvey, 2004b). Thus, there is considerable uncertainty concerning the global mean temperature change large enough to initiate collapse of the GIS, but seems likely to fall in the 2-4 K range. Irreversible melting of the GIS would occur when initial melting of the ice cap lowers (and therefore warms) the surface elevation to the point that melting would continue even if GHG concentrations were to return to some lower level. The WAIS is grounded on sills below sea level and is susceptible to collapse once the ocean water surrounding it begins to warm and weakens the grounding points. Regional warming of 4-8 K may be sufficient to destabilize the WAIS, although the risk is poorly quantified (Oppenheimer and Alley, 2004). Geological data indicate that collapse of the GIS or WAIS in association with modest warming is a very real risk. Sea level was likely 4-6 m higher during part of the previous interglacial period (130,000 to 127,000 years ago) but global mean temperature was only about 1 K warmer (Stirling et al., 1998; Cuffey and Marshall, 2000; McCulloch and Esat, 2000; Overpeck et al., 2006). Simulations with a state-of-the-art coupled ice sheet atmosphere-ocean climate model of conditions during the last interglacial indicate that summer temperatures along the coast of Greenland were about 3 K warmer than at present, and were sufficient to provoke partial but not complete melting of the GIS (Otto-Bliesner et al., 2006). The last-interglacial simulations of Otto-Bliesner et al. (2006) reproduce many patterns of the last interglacial climate, inferred from paleoclimatic evidence, including the lack of warming in the southern hemisphere. The simulated partial melting of the GIS contributes 2.2-3.4 m sea level rise; however, the Greenland ice cap will likely be more susceptible to future melting than during the last interglacial, due to the reduction in snow albedo from anthropogenic soot. Some contribution to the last interglacial sea level peak from the West Antarctic ice sheet or from the margins of the East Antarctic ice sheet is implied, likely induced by the initial sea level rise from partial melting of the Greenland ice cap. During the middle Pliocene (3 million years ago), global mean temperatures are estimated to have been 3 K warmer than today (Crowley, 1996; Dowsett et al., 1996) and sea level 25±10 m higher than today (Barrett et al., 1992; Dowsett et al., 1994; Dwyer et al., 1995). This suggests that the threshold for a mere 5-6 m sea level rise is less than 3 K global mean warming. Conventional thinking is that very little change will occur in the Greenland and	

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						Antarctic ice sheets during the next century, such that, in combination with thermal expansion of ocean water and melting of alpine glaciers, average sea level will rise by only 9-88 cm during the period 1990-2100 (Church et al., 2001). Indeed, may models predict that Antarctica will grow in mass as the climate warms, due to increased snowfall, thereby contributing to a fall in sea level. However, in order to reconcile the observed SLR of about 20 cm during the past century with estimated SLR due to the sum of all contributing processes, it must be assumed that Antarctica has contributed a SLR of about 10 cm during the past century – that is, that the Antarctic ice cap is currently losing mass (Harvey, 2000, Chapter 5). Current ice sheet models do not include processes such as infiltration of surface meltwater through crevices to the ice sheet bed, where it can lubricate the bed and lead to accelerated flow (Alley et al., 2005). During the last deglaciation, sea level rose as rapidly as 20 m per 400 years – a rate of increase that current models cannot simulate. Hansen (2005) has raised the possibility that SLR due to melting of the Greenland ice cap and collapse of the West Antarctic ice sheet could be much more rapid that currently believed. Rapid collapse of Greenland could begin through lubrication of the base of the ice cap from meltwater due to a single unusually warm summer, perhaps in combination with summer rainfall, which could lead to significant discharge of ice into the North Atlantic ocean, where heat from a large volume of ocean water could be used to melt the ice at much greater rates than could occur in situ. Such events occurred repeatedly during the last ice age. As noted by Oppenheimer and Alley (2005), computer models of the WAIS may also be too resistant to warming, as they do not simulate ice streams well. Based on the above, it is concluded here that an increase in global mean temperature of somewhere between 1 K and 3 K will likely destabilize either the Greenland ice cap or the West Antarctic ice cap or both." I am attaching my review paper so that the references cited here can be tracked down if desired." SOURCE OF EXCERPT: Harvey L D D 2006 Dangerous Anthropogenic Interference, Dangerous Climatic Change, and Harmful Climatic Change: Non-Trivial Distinctions with Significant Policy Implications Clim. Change (accepted) (Danny Harvey, Dept of Geography, University of Toronto)	
E-6-267	A	22	45	22	49	implications for adaptation responses and human vulnerability to sea level rise and climate change will also be influenced by level of disaster risk management achieved and ability to reduce disaster losses; in other words, to what extent the mainstreaming of climate change and disaster risk reduction into national sustainable development planning is effective (Silvia Llosa, ISDR System)	Addressed. 'Level of disaster risk management' has been included in the sentence. A fuller treatment is given in Section 6.6.3.

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E-6-268	A	22	47	22	49	The potential economic impact in the Caribbean is significant - about 14.8% of GDP and 15.5% of all jobs in the Caribbean derive directly or indirectly from the travel & tourism industry, much of which is based on the coast. Some countries are more specialized than others; in Jamaica, for example, some 36.0% of GDP and 31.8% of all jobs derive directly or indirectly from the industry. Current projections indicate that by 2014 some 42.9% of Jamaica's GDP and nearly 40% of employment will derive directly or indirectly from the industry. (Anthony Clayton, University of the West Indies)	N.A. Interesting comments but more relevant for chapter 16.
E-6-269	A	23	5	23	12	The examples in this paragraph do not support the topic sentence. The examples show high population and commerce close to the coast but do nit illustrate a difference between developing and developed countries. (Denise Reed, University of New Orleans)	Addressed. Sentence has been revised.
E-6-270	A	23	5	23	7	Add to this list 'the higher socio-economic burden imposed by present climate-related hazards and disasters' (Silvia Llosa, ISDR System)	Addressed. The words in quote have been added to the sentence.
E-6-271	A	23	8	23	8	replace the word 'are' with 'located' (Donald Cahoon, Patuxent Wildlife Research Center)	Addressed.
E-6-272	A	23	18	23	22	This paragraph about slr and freshwater should begin with the more obvious examples - estuaries and aquifers etc - rather than erosion where the link is less obvious. The folloowing paragraphs then amplify these issues. (Denise Reed, University of New Orleans)	Addressed. The paragraph has been revised to address the more obvious examples and following paragraphs to amplify the issues.
E-6-273	A	23	21	23	21	It's better to use saltwater in the stead of tidal water. (Congxian Li, Tongji University)	Addressed.
E-6-274	A	23	35	23	38	within this sentence please insert "submarine groundwater discharges (Taniguchi & Iwakawa 2004)" (Rafiqul M. Islam, Integrated Coastal Zone Management Program)	Addressed. The words in quote have been added to the sentence.
E-6-275	A	23	35	23	36	The wording of this sentence is unclear. Suggested rewording: "Locally, salt-water intrusion impacts coastal aquifers and the scale of impacts …" (Donald Cahoon, Patuxent Wildlife Research Center)	Addressed. Sentence has been revised as suggested.
E-6-276	A	23	35			give examples of regional differences (Clair Hanson, IPCC TSU)	Addressed. Examples are provided by Milly, et al. 2005.
E-6-277	A	23	42	23	44	The water leakage rate in many developing countries is over 50%. In Jamaica, the combination of leakage and theft (illegal connections, some of them made privately by Water Commission engineers) may account for as much as 70% of the water in the pipes. In most developing countries agriculture is the largest consumer, typically accounting for 75-90% of total consumption, industry and domestic consumption take the rest. So we cannot focus our concerns solely on the water	Addressed. 'Efficiency of use of water' and 'agriculture' have been included in the revision.

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						availability/supply issues, it is important to look at the efficiency with which water is used. It is also important to look at the overall efficiency of use - in Jamaica, the largest agricultural user is the sugar industry, which owes its existence to EU trade preferences (which give the industry guaranteed sales at up to three times the market price). When these preferences are withdrawn, the sugar sector may collapse, which would remove the largest consumer of water from the market. (Anthony Clayton, University of the West Indies)	
E-6-278	A	23	43	23	43	replace "theft or" with "theft of" (Donald Cahoon, Patuxent Wildlife Research Center)	Addressed.
E-6-279	A	23	45			give examples of these specific impacts expected by 2050s (Clair Hanson, IPCC TSU)	Addressed. Examples are from Arnell, 2004.
E-6-280	A	23	47	23	47	global change' here is too general - be specific about the driver (Denise Reed, University of New Orleans)	Addressed. 'Water stresses arising from either water withdrawal increases or water availability decreases' added.
E-6-281	A	24	2	26	3	Section 6.4.1.3 Estuaries and Lagoons and 6.4.2.1 Freshwater Resources. This recent paper is definitely worth citing as it clearly outlines the link between freshwater and marine systems and suggests how the effects of human river regulation may have more dire consequences under a changing climate. Flemer, D.A. and M. A. Champ. 2006. What is the future fate of estuaries given nutrient over-enrichment, freshwater diversion and low flows? Marine Pollution Bulletin 52 (2006) 247–258. Also, this paper may be worth citing (presuming it is published on time), as it evaluates measured and potential system responses to climatic changes, from a geomorphological perspective, which is hitherto lacking. Day, J.W., R.R. Christian, D.M. Boesch, A. Yáñez-Arancibia, J. Morris, R. R. Twilley, L.A. Naylor, L. Schaffner, H. Haas, C. Stevenson. (submitted) Consequences of climate change on ecogeomorphology of estuarine wetlands. (Larissa Naylor, Environment Agency & University of East Anglia)	N.A. For section 6.4.1.3
E-6-282	A	24	3	24	8	The examples used in this paragraph do not link well to the issues. The text is too general to be meaningful and it doesn't lead into subsequent paragraphs well - e.g., no mention of forests specifically. (Denise Reed, University of New Orleans)	Addressed. The revised paragraph indicates the general climate change impacts on the issues in this section.
E-6-283	A	24	10	24	15	Citations needed to support this. Species variation may be critical here - at leats mention forest communities/types (Denise Reed, University of New Orleans)	Addressed. The paragraphs have been revised to provide better examples.
E-6-284	A	24	12			give examples (Clair Hanson, IPCC TSU)	Ditto.
E-6-	A	24	21			quantify the reductionin yield	Ditto.

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285						(Clair Hanson, IPCC TSU)	
E-6-286	A	24	22			ditto for Asian regions (Clair Hanson, IPCC TSU)	Ditto.
E-6-287	A	24	43	24	45	There is a bit of repetition about ocean acidification. It has been said in page 17. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Addressed. Repetition removed; only the impacts of ocean acidification on fisheries are mentioned.
E-6-288	A	25	6	25	7	Delete "One is" so that the sentence starts as follows: The loss of natural…. (Donald Cahoon, Patuxent Wildlife Research Center)	Addressed.
E-6-289	A	25	6	27	2	Could you mention that changes in salinity in coastal sediments and waters and changes to acidification may have impacts on the stability of many structures (concrete will become more easily deteriorated) and economic activities (eg salt pans). Such impacts are not well studied yet but may be critical for some coasts - especially perhaps those in hot arid climates such as the Middle East where oil handling facilities etc may be at risk (Heather Viles, University of Oxford)	Addressed. New sentence added : 'Changes in salinity of coastal sediments and waters and changes to acidification may have impacts on the stability of many coastal structures in hot arid climates'.
E-6-290	A	25	12	25	12	In the Caribbean, there are two major drivers of urban settlement and the location of infrastructure on the coast. One is tourism. The hotel developers prefer to build as close to the sea as possible, although some countries have enforced set-backs. In Jamaica, the number of tourist arrivals per year (1.2m) is now nearly half the population of Jamaica (2.6m), and many of these people congregate at the coast, representing a significant at-risk group. The other driver is property development. In Jamaica, the most rapidly-growing area of urban settlement is Portmore, which has city status but is essentially a dormitory suburb for Kingston. The official population is 162,000, but informal developments and multi-occupancy mean that it may be over 200,000. Portmore was built on a reclaimed flood plain, has no sea defences, and only three roads out (two running north, one south). A major hurricane, approaching from the south, would drive a storm surge into Kingston Harbour, which would immediately flood Portmore. At the same time, the heavy rain would cause a surge down the Rio Cobre, thus cutting off the two roads to the north. It would be impossible to evacuate the entire city down the one remaining road, so the number of fatalities would probably be high. (Anthony Clayton, University of the West Indies)	Addressed. 'Coastal resort development' is included in the sentence.
E-6-291	A	25	15	25	51	Box 6.3 - The graphic quality of the figures is not very good. A small map of N America would also help the non-specialist reader to situate him/herself in the area. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	The graphic quality has been improved greatly
E-6-292	A	25	16	25	55	One of the important lessons from New Orleans is that it is obviously sensible to allocate most of the scarce management time and investment capital to high impact,	Agreed – the point that even wealthy countries are vulnerable to CC and SLR is made in the

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						high probability events, but it is also important to monitor high impact, low probability events. The US Federal Emergency Management Agency knew that New Orleans was potentially vulnerable to a severe hurricane, and had identified this as one of the three worst disasters that could befall the United States. This was, however, seen by the administration as a low probability event. (Anthony Clayton, University of the West Indies)	Chapter.
E-6-293	A	25	20	25	24	Make it clear that the loss of wetlands quoted and the loss of Chandeleur Islands is based on immediate post-storm assessments and some recovery may be expected (especially in the barrier island systems). Undoubtedly recovery assessments will be available prior to the release of this report and this caveat will put these statements in the correct context. (Denise Reed, University of New Orleans)	Addressed
E-6-294	A	26	3			Overtopping - not necessarily breaching. Whether the structure fails is more complex than whether it gets overtopped. This distinction is especially important if the New Orleans example is to be included. (Denise Reed, University of New Orleans)	Addressed.
E-6-295	A	26	5	27	16	Section 6.4.1.4 Saltmarshes This section would benefit from better illustrating the range of 'ecosystem services' that saltmarshes provide such as wave attenuation, carbon, nutrient and pollutant storage and how these 'services' might be under threat due to predicted losses of global marshes. If done well, this could better illustrate the potential economic consequences of climate change such as increased flood defence costs or infraction charges for having estuarine water quality decline. Adam, P. 2002. Saltmarshes in a time of change. Environmental Conservation 29(1): 39-61. Reed, DJ 2002 Sea-level rise and coastal marsh sustainability: geological and ecological factors in the Mississippi delta plain. Geomorphology 48, 233-243. Connor, RF, Chmura, GL, Beecher, CB. 2001. Carbon accumulation in Bay of Fundy salt marshes: Implications for restoration of reclaimed marshes. Global Biogeochemical Cycles 6: 1-12. Similarly there is no mention of the (largely western) focus on restoration or recreation of natural systems, such as saltmarshes. A couple of key papers highlighting the debates surrounding this issue should be cited. Possibilities are: French, P.W. (2006). Managed realignment – The developing story of a comparatively new approach to soft engineering. Estuarine, Coastal and Shelf Science 67, 409-423. Wolters, M., A. Garbutt and J.P. Bakker. 2005a. Salt-marsh restoration: evaluating the success of de-embankments in north-west Europe. Biological Conservation 123, 249-268. Weinstein, M.P., J.M. Teal, J.H. Balletto and K.A. Strait 2001. Restoration principles emerging from one of the	N.A. This is for section 6.4.1.

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						world's largest tidal marsh restoration projects. Wetlands Ecology and Management, 9: 387–407. Wolters, M., J.P. Bakker, M.D. Bertness, R.L. Jefferies and I. Moller. 2005. Saltmarsh erosion and restoration in south-east England: squeezing the evidence requires realignment. Journal of Applied Ecology 42, 844-851. (Larissa Naylor, Environment Agency & University of East Anglia)	
E-6-296	A	26	8	26	8	Regarding impact of climate change on port facilities, it could be noted that in light of the importance of shipping for the global economy and their sensitivity to natural hazards, food supplies for coastal urban areas and other economic assets will be at greater risk. (Silvia Llosa, ISDR System)	N.A. Minor point.
E-6-297	A	26	9			small graph of frequency that the Thames Barrage has been raised over time would be very effective! Though needs two curves, the second showing London also sinking. (Charles Sheppard, Warwick University)	N.A. Too detailed. Closures of the barrage are linked to maximum levels of water.
E-6-298	A	26	20	26	43	The statement is made that "potentially hundreds of millions of people are threatened with flooding by sea level rise", which I completely agree with, and then Fig 6.3 is referred to in support of the statement. However, Fig. 6.3 barely shows more than 100 million people (hardly "hundreds", and only for one case). The problem is that the quoted statement is true on a time scale of several centuries, whereas the Figure shows impacts only for the 2080s. Also, the Hadley model itself is an atmosphere ocean GCM (although it is not entirely clear what is meant by "the Hadley model") and so cannot, by itself, predict sea level rise, so the results are really based on some glacier and ice cap models driven with a scenario of regional climate change. As indicated in the extensive excerpt from my own review (provided in my comment to page 22), current models ice sheet models likely underestimate the sensitivity of ice sheets to warming. I suggest revising the sentence to read something like" Hundreds of millions of people would be affected by sea level rise over a period of several centuries if either the Greenland Ice Cap were to completely melt or the West Antarctic Ice Sheet were to collapse (both of which could be triggered by warming anticipated this century under business as usual emission scenarios). Even within this century and for scenarios that assume minimal response of Greenland and no net loss from West Antarctica, several tens of millions of people to perhaps 100 million people could be affected (Figure 6.3)" [the actual assumptions behind Fig 6.3 need to be checked, and the above statement modified if necessary]. You could also refer to Box 6.4, which points out that 300 million people inahbit the 40 largest deltas in the world and that most of these	Text completely rewritten and a new Figure added that has numbers rising to 100 million people.

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						people are at risk. (Danny Harvey, Dept of Geography, University of Toronto)	
E-6-299	A	26	21	26	21	replace the period after (Figure 6.3) with a comma. (Donald Cahoon, Patuxent Wildlife Research Center)	Addressed.
E-6-300	A	26	21			capital A for 'although' (Clair Hanson, IPCC TSU)	N.A.
E-6-301	A	26	23			which question? It isn't clear that a question has been asked (Clair Hanson, IPCC TSU)	Addressed.
E-6-302	A	27	10	27	10	insert the word "are" at the end of this line (Donald Cahoon, Patuxent Wildlife Research Center)	Addressed.
E-6-303	A	28	18	28	40	The demand for sun, sand and sea holidays continues to rise, even as other tourism products are developed.This industry is a driver of change, as well as a potential victim; air travel is rising rapidly as a result of rising demand and falling prices. Air travel is not the largest source of carbon emissions, but it is the most rapidly-growing source; air traffic has been expanding at nearly two-and-half times average economic growth rates since 1959. The current UK Government's Aviation White Paper notes that aviation has increased fivefold over the last 30 years, and predicts that UK passenger numbers will more than double from 180 million to 475 million over the next 25 years. In September 2005 the Tyndall Centre for Climate Change calculated that all householders, motorists and businesses in the UK would have to reduce their CO^2 emissions to zero if the aviation industry was to be incorporated into the UK Government climate change targets for 2050. In other words, the entire UK economy would have to emit no carbon at all, because the airline industry would be emitting so much that it would consume the UK's entire carbon allowance. There is one potentially significant change, however, in that the most rapidly-growing segment of the tourism market in the Caribbean is now cruise ship holidays. These will visit a few Caribbean islands, but only half of the tourists go ashore, the rest stay on board. The average stay on shore is about 6 hours, so the opportunity to make money from the visitors is relatively limited.However, this segment of the market is not vulnerable to sea level rise, unlike the hotels on the coast, although it is affected by severe weather conditions. (Anthony Clayton, University of the West Indies)	Addressed. New sentence added : 'Within the Caribbean, the rapidly-growing cruise industry is not vulnerable to a sea-level rise, unlike coastal resorts'.
E-6-304	A	28	43	29	47	Box 6.4 - The text is not in the most appropriate place. It should be placed in the text where natural system responses is, or to the subsection about human settlements. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Box moved to Section 6.4.1
E-6-	A	29	6	29	6	replace the phrase "an expanding" with "and expanding"	Addressed.

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305						(Donald Cahoon, Patuxent Wildlife Research Center)	
E-6-306	A	29	6	29	6	...significant and... (Bhawan Singh, Universty of Montreal)	Ditto.
E-6-307	A	29	6			remove 'an' or replace with 'and' (Clair Hanson, IPCC TSU)	Ditto.
E-6-308	A	29	26	29	42	In the Figure B6.4.1. there is a Changjiang, not Changji. (Congxian Li, Tongji University)	Corrected
E-6-309	A	29	44			the figure indicates number of people displaced if current sea level trend continues to the 2050s. However, the dagner is that the rate of sea level will accelerate and may reach 1 m SLR by 2100. At the very least, a caveat needs ot be added in the figure captions stating that the rate of sea level rise could accelerate by a factor of 3-5 over the next century (that is, 60-100 cm over the next century,compared to 20 cm over the past century), greatly increasing the number of people affected this century. (Danny Harvey, Dept of Geography, University of Toronto)	Figure reflects the data – this point is made elesewhere in the chapter.
E-6-310	A	30	11		12	please reword/complete the sentence (Clair Hanson, IPCC TSU)	Addressed. New sentence added : 'Stabilization of GHG concentrations at different levels imply different climatic advantages and disadvantages for coastal areas'. Subsequent sentence modified.
E-6-311	A	30	12			Did not understand. Statement is too brief to convey anything. (Ian Townend, HR Wallingford)	Ditto.
E-6-312	A	30	29	30	31	Table 6.5: (1) Natural adaptive capacity for delta and low-lying coastal wetland may be low-high instead of low-medium because many deltas are feeded by sediment-rich rivers. (2) Ice-dominanted coasts may be medium exposed due to lack wave during freeze-up. (3) Sand and gravel beach is in medium exposure rather than in high exposure. (4) hard rock cliffs is usually in high exposure and their adaptive capacity should be low or very low judging by sediment supply contributed by erosion of the cliffs. (Congxian Li, Tongji University)	Table 6.5 was deleted.
E-6-313	A	30	29	30	31	Table 6.5. This is a curious table. Firstly, the types confuse different scales of coastal system. Thus, for example seagrasses (why seagrasses? Why not saltmarshes or mangroves?) and sand / gravel beaches nest within the larger scale systems listed. Secondly, it is not at all clear how the various scores have been arrived at. What exactly is the difference between 'low-medium' and 'medium'? If an entry is 'low-high' is that really helpful? How can soft rock and hard rock cliffs have the same exposure? How can estuaries be regarded as 'low-medium' in	Table 6.5 was deleted.

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						exposure given the problems on estuarine margins around the world? How long has there been a delta in the lower Mississippi valley? That would argue for high natural adaptive capacity... Similarly, how long have coral reefs been around? What sorts of sea level changes have they coped with over the Pleistocene?... In fact one could make a case, in some ways already made in the introductory text to this chapter, to code all boxes as 'high'. I would omit this table; it raises more questions than it answers. (Thomas Spencer, University of Cambridge)	
E-6-314	A	30	29		31	There no comprehensible explanation for the scale applied in table 6.5. Which indicators were used to assess for example the "natural adaptice capacity", and at which level of indicator value the vulnerability of a coastal system switches from Low to High and what characterises Low-Medium? As I recommended to ommit some sections on page 22 to 23, this space could be used to describe the applied scale. (Wilhelm Windhorst, Kiel University)	Table 6.5 was deleted.
E-6-315	A	30	30			Table 6.5: The phrase Natural Adaptive Capacity is misleading. Indeed on p31,15 it is noted that the adaptive capacity is largely dependent upon development status. The natural system is 100% adaptive. This is inherent in the form and funtion and is reflected in the (relatively) transient or static nature of the different types of system. One particular system may however change into a different system (in say morphological or ecosystyem terms) in the process. The notion of capacity must therefore relate to the degree to which the natural adaptive response is constrained by anthropogenic interests. It then follows that adaptive capacity relates to the ability to modify human imposed constraints to enable a more natural response. (Ian Townend, HR Wallingford)	Table 6.5 was deleted.
E-6-316	A	30	30			Table 6.5 is really nice and stimulates thought. It would be good to show where your estimates of the risk levels are derived from and clarify in more detail what exposure, sensitivity and natural adaptive capacity are. It would also be helpful in the text following the table to stress that, in many areas, these different types of coast (in the different rows of table 6.5) are interlinked within functioning systems - so it may be over-simplified to look at their vulnerability individually (eg reefs protect tropical beach systems) (Heather Viles, University of Oxford)	Table 6.5 was deleted.
E-6-317	A	30	34	30	35	There is a bit of repetition about sea-level rise being uneven around the world coastline. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Disagree. The local scale varibality in sea level rise is very important in this section about key vulnerabilites.
E-6-	A	30	35			The reference to section 6.3.2 for more detail on how sea-level rise varies globally	Disagree. We refer to the first paragaph in

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318						is misleading. There is not information on this in that section except a sentence that says local subsidence etc is important. There is a box on extreme water levels but (see my eariler comment) that doesn't allow us to see slr separate from the events driven water levels. (Denise Reed, University of New Orleans)	section 6.3 rather than repeat the information about the influence of subsidence, uplift and other regional factors that influence sea level here.
E-6-319	A	31	2	31	2	Repetition of "which". "... Limiting the degree to which we can..." (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Disagree.
E-6-320	A	31	4	31	4	delete the second "that" (Donald Cahoon, Patuxent Wildlife Research Center)	Done.
E-6-321	A	31	10		11	Please include the numbers of those chapters refered in the 2nd column in table 6.5. Are there references which confirm the statement about the cost benefit ratio in Venice and the Asian megadeltas? (Wilhelm Windhorst, Kiel University)	Disagree, the fact that they are in Chapter 6 does not mean that these impacts are also discussed in the regional chapters of the report.
E-6-322	A	31	13	31	20	One of the main problems is that many developing countries have weak institutions and regulatory mechanisms. Planning controls (such as zoning and enforced set-backs) are not always applied, or can be circumvented by sufficiently powerful, well-connected people. So hotels, leisure developments and human settlements continue to be built in areas that are already vulnerable. (Anthony Clayton, University of the West Indies)	Accept, we inserted the word “institutional:” in the list of barriers to adaptation.
E-6-323	A	31	13	31	20	Is there any reference for this point? (Miltiadis Seferlis, Greek Biotope Wetland Centre)	Added Yohe and Tol (2002)
E-6-324	A	31	14	31	14	after 'adaptive capacity', add 'to both present and future climate variability and change' (Silvia Llosa, ISDR System)	Disagree – due to space considerations
E-6-325	A	31	15			"Adaptive capacity is largely dependent upon development status", according the youngest experiences with Katrina in New Orleans, I would reccomend that lacking risk awareness in developed countries is influencing their adadtive capacity as well. (Wilhelm Windhorst, Kiel University)	Accept, a sentence about lack of risk awareness was added at the end of the paragraph.
E-6-326	A	31	25	31	25	climate chrange should be climate change (Donald Cahoon, Patuxent Wildlife Research Center)	Corrected
E-6-327	A	31	25			typo chrange --> change (Clair Hanson, IPCC TSU)	Corrected
E-6-328	A	31				Table 6.6: first left-hand side box: change to 'constraints with respect to disaster risk reduction and adaptation' In 3d box add 'in particular low-lying cities' after coastal areas (Silvia Llosa, ISDR System)	Table simplified – text deleted.
E-6-	A	32	6			replace "comprehensive" with "more inclusive"?	Done

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
329						(Ian Townend, HR Wallingford)	
E-6-330	A	32	49	33	23	Section 6.4.2.2 Agriculture, forestry and fisheries. This section really only addresses one aspect of these industries – i.e. the effect of climate change on them. Yet, these industries, both in the coast and catchments that feed into coastal systems are the sources of many pressures on water and ecological quality in these systems. This section would benefit from highlighting this complexity in simple terms, thereby illustrating the interconnections between the coastal and other more terrestrial chapters – and importantly the potential exacerbation of human impacts on ecosystems, by climatic change. For example, if there is greater intense rainfall in catchments, this may increase the amount of polluted material and sediments entering estuaries, thereby impacting on estuarine quality – by increasing the risk of toxic planktonic blooms, particularly when coupled with predicted changes in sea surface temperatures. Potential references for some of the ecosystem services are: Adam, P. 2002. Saltmarshes in a time of change. Environmental Conservation 29(1): 39-61. Attrill, M.J., D.T. Bilton, A.A. Rowden, S.D. Rundle and R.M. Thomas. 1999. The impact of encroachment and bankside development on the habitat complexity and supralittoral invertebrate communities on the Thames estuary foreshore. Aquatic Conservation: marine and freshwater ecosystems 9: 237-247. Colclough, S., L. Fonseca, T. Astley, K. Thomas and W. Watts. 2005. Fish utilisation of managed realignments. Fisheries Management and Ecology 12: 351-360. (Larissa Naylor, Environment Agency & University of East Anglia)	We have pointed out these multiple stresses in 6.2 and 6.4.3 – space precludes detailed tratement here.
E-6-331	A	33	1	33	16	There are several important lessons from recent tragedies, such as Hurricanes Mitch, Katrina and Ivan, and the Asian Tsunami. One is that we need an effective early warning and communication system. For example, sub-sea sensors, linked to a control centre, in turn linked to every Emergency and Disaster Management Agency in potentially affected nations, would have given an early warning. The Agencies would, in turn, need to have plans to have emergency warnings distributed via every radio station, internet service and mobile phone service provider. Another lesson is that many people will not flee because they fear that looters will rob their stores, steal their few possessions, and thereby take away their livelihoods. So the first priority must to protect life, but for many people the second priority is to try to protect their livelihoods. A third lesson is that issues such as climate change can expose the hidden cost of current behaviour. For example, the New Orleans disaster was compounded by the fact that the original wetlands (plus much of the Everglades) had been drained, infilled and developed, which means that they were not longer able to absorb and buffer surges of water.	These are important points. We have attempted to capture them in a new box.

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						(Anthony Clayton, University of the West Indies)	
E-6-332	A	33	2	33	4	If insurance policies incorporate business interruption insurance loss estimates are recognised in disaster cost accounting. (Silvia Llosa, ISDR System)	The point is that most businesses do not have such cover, or claims are denied due to exclusions in policies.
E-6-333	A	33	11	33	11	place a period after the word "mould" (Donald Cahoon, Patuxent Wildlife Research Center)	Done.
E-6-334	A	33	11	33	11	Period missing : …and mould. Within... (Bhawan Singh, Universty of Montreal)	Corrected.
E-6-335	A	33	11			full stop after 'mould' (Clair Hanson, IPCC TSU)	Corrected.
E-6-336	A	33	18	33	19	Isn't it box 6.3? (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Corrected.
E-6-337	A	33	24	33	24	after 2000, add 'However, catastrophic human losses have been reduced in the last decade thanks to an improved machinery of warning and preparedness, watchful officials, an aware public and a stronger sense of community responsibility (ISDR 2004, 'Living with risk' available at www.unisdr.org) (Silvia Llosa, ISDR System)	Added.
E-6-338	A	33	26	33	26	"In Cairns (Australia) cyclone..." (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Done.
E-6-339	A	33	34	33	36	We need to be careful here that these aren't all thought of as coastal - this must include tornadoes, river floods, etc. The % of these that are coastal would be helpful to include. (Denise Reed, University of New Orleans)	The text has been amended to reflect this point. The reference gives more details.
E-6-340	A	33	36			the cumulative damage of $500 billion is presumably in constant dollars, but adjusted to what year? (Danny Harvey, Dept of Geography, University of Toronto)	2002 – text now includes this information.
E-6-341	A	33	39	33	41	The sentence "Along..." should go to AFTER the sentence fisishing in page 33, line 46. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Done.
E-6-342	A	33	39	33	41	In contrast to the US experience, work using storm index data for the North Sea suggests the possibility of a different conclusion depending on the time window considered. This showed that the level of storm intensity is only now getting back to levels experienced around 1900. A slow decline in the index between 1900 and 1960 has been followed by a more rapid increase (Holt, 1991). (Ian Townend, HR Wallingford)	This is a 1991 reference. AR4 reflects more recent findings.
E-6-343	A	33	41	33	41	At the end od the para, please add "Wei-shiuen & Mendelsohn (2005) has estimated the annual cost of protecting the coasts of Singapore will range from 0.3 to 5.7	Added to bullets at end of Section 6.5.

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						million US$ by 2050 to 0.9 to 16.8 million US$ by 2100. The present value of these costs ranges from 0.17 to 3.08 million US$ depending on the sea level rise scenario. (Rafiqul M. Islam, Integrated Coastal Zone Management Program)	
E-6-344	A	33	44	33	45	Are these figures for beach retreat or beach lowering? (Thomas Spencer, University of Cambridge)	Changes in text, in response to other comments, make this comment redundant.
E-6-345	A	33	45	33	45	"... of Delaware's Atlantic coast (USA)..." (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Done.
E-6-346	A	33	45			Expressing Delaware's loss rate in cm/yr doesn't make it look very dramatic. Louisiana has much more rapidly eroding shorelines. If You want to use Delaware suggest using a decadal scale average to show a change in shore position that could have an effect. However, if the study only has short term rates, I suggest using another area that has longer term data. (Denise Reed, University of New Orleans)	Changes in text, in response to other comments, make this comment redundant.
E-6-347	A	33	50	33	51	There are also important issues about the role of the state and insurance companies. Should, for example, the US government provide flood assistance? Does this encourage people to build in vulnerable areas? Should vulnerable areas be made un-insurable? (Anthony Clayton, University of the West Indies)	Cooments are reflected in the revised text.
E-6-348	A	33	50	34	2	The sentence "Major questions..." is too long and has too many ";". (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Revised.
E-6-349	A	33	50			Using Eurosion as a source for a US damage number seems odd. (Denise Reed, University of New Orleans)	The costs (expressed in $US for consistency) relate to erosion of European coasts, not US coasts.
E-6-350	A	34	14	34	14	Whats is uced? (Bhawan Singh, Universty of Montreal)	Typo corrected.
E-6-351	A	34	14	34	14	first word of this line should be "reduced" (Donald Cahoon, Patuxent Wildlife Research Center)	Done.
E-6-352	A	34	14			uced? (Clair Hanson, IPCC TSU)	Typo corrected.
E-6-353	A	34	14			reduced for 'uced' (Peter Saenger, Southern Cross University)	Typo corrected.
E-6-354	A	34	20			capital most productive' - what does this mean? (Clair Hanson, IPCC TSU)	Revised.
E-6-355	A	35	14	35	16	How much is the amount of the total damage in US$? (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Information added.
E-6-356	A	35	22	42	20	Reduce to within 5 page (Qilun Yan, National Marine Environmental Monitoring Center)	This would not be consistent with IPCC plenary guidance or with views of the

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
							chapter's authors.
E-6-357	A	35	22			Section 6.6 does not mention adaptation measures to reduce direct threats to ecosystems/species survival, such as establishment of marine protected areas, 'no take' reserves and other conservation measures. (Silvia Llosa, ISDR System)	Text has been added in 6.6.1.4. This topic is also addressed in Ch 4.
E-6-358	A	35	36			Section 6.6.1 should begin with a preamble saying something such as, "If very large sea level rises ocurr, such as the 10 m or more sea level rise that would accompany the complete melting of the Greenland Ice Sheet and collapse of the West Antarctic Ice Sheet, adaptation to rising sea level would be futile in the long run in most places if not everywhere. Sea level rise this large could very well be triggered by 2-4 C global mean warming (see WG1, Chapter 10, Sections 10.7.4.2 and 10.7.4.3), which in turn is highly likely within this century under business-as-usual emission scenarios. Many if not all current coastal cities would have to be abandoned. The discussion in this chapter is restricted to adaptation measures that could be effective against much smaller sea level rises, such as might occur if greenland gas concentrations are stabilizied at relatively low levels within this century, if climate sensitivity is in the lower part of the expected range (1.5-4.5 for a CO2 doubling) and if the Greenland Ice Cap and West Antantartic Ice are resistant to collapse" (Danny Harvey, Dept of Geography, University of Toronto)	The points will be addressed in a new box.
E-6-359	A	36	4	36	5	Table 6.7. Either change the table heading to "Overcoming major impediments…." or the text. As written, the text is a jumbled mix of impediments and ways of surmounting them. If a list of impediments is the important point here, then rephrase, e.g.: 1. Lack of dynamic predictions of landform migration; 2. Insufficient or inappropriate shoreline protection measures, 3. Data exchange and integration hampered by wide diversity in information acquisition and storage, 4. Lack of definition of key indicators and thresholds relevant to coastal managers, 5. Insufficent knowledge of coastal conditions and appropriate management measures, 6. Lack of long term data for key coastal descriptors, 7. Fragmentation and ineffective institutional arrangements and weak governance. (Vivien Gornitz, Goddard Institute for Space Studies)	Suggested changes have been made.
E-6-360	A	36	4			Table 6.7: Misses (a) societal resistance to change and (b) the need to engage the public. (Ian Townend, HR Wallingford)	Suggested changes have been made.
E-6-361	A	36	16	36	16	Please put the abbreviation "ICZM" already in the title. (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	Done.
E-6-362	A	36	16	37	6	This section on ICZM is out of context and not correctly integrated into the text. The section should be cancelled and the text shifted at the end of 6.61.1 Issues and	Agree. Integration has been addressed.

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						challenges, after Table 6.7 in order to be presented as the response to the major impediments as shown in Table 6.7 (Yves Henocque, Department of Fisheries)	
E-6-363	A	36				T6.7 should the heading of column 1 be 'impediment' as some seem to be possible actions to improve the situation (Clair Hanson, IPCC TSU)	Table has been revised.
E-6-364	A	37	8	37	8	With cancelling of current section 6.6.1.3, section 6.6.1.4 should become 6.6.1.3 (Yves Henocque, Department of Fisheries)	See response above – but section remains as requested in guidance from IPCC plenary.
E-6-365	A	37	8			this sub-section could mention briefly lessons learnt from the recent tsunami. We propose the following for your consideration because protection against tsunami also means protection against storm surges and coastal flooding and hints to the benefits to be drawn from integrating risk assessment and knowledge. Coastal protection: coral reefs, mangrove forests reduce tsunami destruction: The tsunami had less impact in areas where coastal ecosystems were protected. The Stockholm Environment Institute discovered in a rapid assessment of the environmental impact of the tsunami that sand dunes, mangrove forests and coral reefs helped reduce the energy of tsunami waves in Sri Lanka by acting as natural barriers. (UNEP, 2005, 'After the tsunami, rapid environmental assessment', 141 pp). Coral reefs stretch from the surface of water down to the limit of light penetration - about 30m deep. A healthy reef acts much like a natural breakwater and there is evidence they can protect coastlines. In Peraliya, the tsunami wave reached 10 meter height, swept 1.5 kilometers inland, and carried a passenger train about 50 meters off its track causing 1700 fatalities, whereas just three kilometers to the south, in the town of Hikkaduwa, Sri Lanka, the wave was only 2-3 meters in height, traveled only 50 meters inland and caused no deaths. Fernando et al. (2005) observed that the key factor to this pattern of patchy inundation was the presence or absence of coral and rock reefs offshore. For example, from Hikkaduwa to Dodanduwa, an area partly fronted by rock reefs or partly sheltered by coral reefs, the damage was relatively modest. In areas from Hikkaduwa north to Akuralla, where coral reefs had been destroyed, the damage and loss of life was extensive. Coral reefs seemed to have visibly reduced the height of the water wall and deflected the wave action parallel to the shore. The authors noted as well that the low-lying Maldives islands experienced less damage, probably owing to the presence of healthy coral reefs surrounding. There are many examples around the Indian Ocean of mangrove vegetation absorbing the energy of the tsunami waves and shielding inland areas from	6.6.1.4 does identify some lessons learned. A new box has been added.

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						destruction. It was observed in five communities in Ranong Province, Thailand, south of the Myanmar border along the Andaman Coast, that while some houses were damaged by the tsunami the village was partially protected by the wide strip of mangrove between it and the wide ocean. (Pollnac, R.B. and Kotowicz, 2005). When the tsunami struck India's southern state of Tamil Naduareas in Pichavaram and Muthupet with dense mangroves suffered fewer human casualties and less damage to property compared to areas without mangroves (Padma, 2004). Protection of the coastal environment is thus an essential element of tsunami disaster reduction. Reference: Fernando, H.S.J., McCulley, J.L., Mendis, S.G., and Perera, K., 2005, Coral Poaching Worsens Tsunami Destruction in Sri Lanka. Eos 86, 301, 304. Padma, T.V., 2004, Mangrove forests 'can reduce impact of tsunamis', SciDev.Net: http://www.scidev.net/news/index.cfm?fuseaction=readnews&itemid=1823&language=1 Pollnac, R.B. and Kotowicz D., 2005, Initial rapid assessment of tsunami affected villages Tambon Kamphuan, Suk Samran District, Ranong Province, Thailand. Unpublished report, p. 1-22. If interested we can provide more specific examples. (Silvia Llosa, ISDR System)	
E-6-366	A	37	8			The practice of floating agricultural systems could be mentioned (in use in Bangladesh for example) (Silvia Llosa, ISDR System)	Now included in Fig. 6.5.
E-6-367	A	37	26	38	27	"…. sound environmental management and wise resource use (Helmer and Hilhorst, 2006), which underpin the ICZM process". (Yves Henocque, Department of Fisheries)	Accepted and text revised accordingly.
E-6-368	A	37	27	37	27	The phrase "This will accelerate the convergence of the time horizons…" is vague and borders on jargon. (Donald Cahoon, Patuxent Wildlife Research Center)	Revised.
E-6-369	A	37	33	37	33	There are precedents, such as during wars, when school children are taught where to run and how to take cover during an air-raid. In Jamaica, children are taught what to do in an earthquake, and the government distributes hurricane advisory leaflets every year. In spite of this, many people do not make significant preparations for hurricanes until perhaps 24 hours before the eye of the storm is due to arrive. There is a particular issue with regard to non-linear changes, as we tend to assume that past behaviour is the best guide as to the pattern of future behaviour. This is, of course, often correct. However, there are times when this assumption is not only wrong, but actually unhelpful, because people may assume a level of	These are excellent observations, but need to be traceable to the literature in order to be included in the report.

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						continuity and resilience that does not exist. (Anthony Clayton, University of the West Indies)	
E-6-370	A	37	42	37	51	Should be deleted till "….. Including beach loss". (Yves Henocque, Department of Fisheries)	No reason is given. The authors consider that these lines contain important messages.
E-6-371	A	37	51	38	4	The entire phrase beginning with "The particular adaptation strategy adopted….", should go up to Line 40 closing up the paragraph. (Yves Henocque, Department of Fisheries)	Comment redundant given above response.
E-6-372	A	38	6	38	6	The section 6.6.1.5 Current adaptation practises and planned adaptation should be suppressed (Yves Henocque, Department of Fisheries)	No reason is given. The authors consider that these lines contain important messages.
E-6-373	A	38	8	38	12	Figure 6.5 should come at the end of 6.6.1.4 Adaptation options (Yves Henocque, Department of Fisheries)	In light of this comment the text has been revised.
E-6-374	A	38	8			Figure 6.5 is also helpful. Would it be worth mentioning or discussing to what extent some of these different adaptation strategies might be mutually incompatible? And at what SCALE some of the may be most appropriate/ successful? For example, if managed realignment can only be done on a patchy basis around an estuary with other adaptations elsewhere, does this make the whole estuarine protection scheme more likely to fail? (Heather Viles, University of Oxford)	Space limits do not allow us to go into such detail. However, the general pointmade here is now included.
E-6-375	A	38	11			I find Table 6.5 very useful. Any chance the various responses could be scaled according to cost (even a $$ -$$$$ scaling would be of interest). It would go well with Table 6.9. Maybe this section could be moved after that to allow this to be integrated. (Denise Reed, University of New Orleans)	Assume comment refers to Figure 6.5. This is a useful comment, but adding cost information would distract reader from the main point of the figure. Also, many of these adaptation practices are not scale (and hence cost) constrained. But an attempt has been made to reflect the general point in 6.6.2.
E-6-376	A	38	26			This statement is far too timid and wishy washy! Of course there are limits to the extent to which natural and human coastal systems can adapt to sea level rise! (Danny Harvey, Dept of Geography, University of Toronto)	Text revised.
E-6-377	A	38	29			replace 'and' with 'or' (Clair Hanson, IPCC TSU)	Done
E-6-378	A	38	31	38	32	This is probably true even in the islands of the Caribbean, where planning and zoning controls could be used to gradually move the infrastructure and main areas of urban settlement out of the most vulnerable areas. Vulnerability does vary, of course, between the islands; some (such as Barbados) are relatively low-lying, others (such as Jamaica) have large areas of high ground. Transport infrastructure is a potential problem. There are 45 major airports in the Caribbean islands. Of these,	This comment is more relevant to Ch 16.

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						23 have runways <20 feet above sea level.Jamaica, for example, has two international airports; Sangster International and NMI. Both are on the coast. The runway elevation at SI is 1.2m, NMI is 3.0m. (Anthony Clayton, University of the West Indies)	
E-6-379	A	39				T6.9 needs clarification: what is a linear km? How does it differ from a km? How does capital cost differ from cost? For US and NZ - on want basis are the ranges in cost determined? (Clair Hanson, IPCC TSU)	Text revised in light of comment; capital costs exclude maintenance costs. Insufficient space to explain ranges, but these reflect location effects etc. Cited references can be consulted for further information.
E-6-380	A	40	2	40	8	Should be deleted (Yves Henocque, Department of Fisheries)	No reason is given. The authors consider that these lines contain important messages.
E-6-381	A	40	18	40	19	How does creating new intertidal habitat result in more stable and cost effective defences? (Thomas Spencer, University of Cambridge)	Text revised in order to clarify the statement; cited reference can be consulted for more information.
E-6-382	A	40	23	40	24	"Absence of an integrated holistic approach to policymaking or integrated coastal zone management approach, and a failure….." (Yves Henocque, Department of Fisheries)	Text revised.
E-6-383	A	40	24	40	24	policymaking or policy-making? (Bhawan Singh, Universty of Montreal)	Text revised.
E-6-384	A	40	32	40	36	"Section 6.6.3 - Repeated phrase" (Ana Ramos Pereira, University of Lisbon)	Text revised.
E-6-385	A	40	33	40	35	Delete the sentence which is a repeatation of previous sentence. (Congxian Li, Tongji University)	Text revised.
E-6-386	A	41	17	41	17	cross-refer to chapter 17 (Silvia Llosa, ISDR System)	Done.
E-6-387	A	41	26	41	26	replace adaptation by 'climate risk management' (Silvia Llosa, ISDR System)	Text revised.
E-6-388	A	41	38	41	45	understanding vulnerability and building resilience could be made explicit in this paragraph. Other possible inclusions include: the understanding of the interaction between ecological, socio-economic and climate systems; research on useful, usable, actionable information to close the science-policy gap (Silvia Llosa, ISDR System)	Space is limited and no references are given; however, suggestions have been adopted wherever possible.
E-6-389	A	42	10			Should make more of this point in the SPM and TS. (Ian Townend, HR Wallingford)	Noted.
E-6-390	A	42	39	42	39	What would be the holistic responses? (Leticia Cotrim da Cunha, Max-Planck-Institut fuer Biogeochemie)	
E-6-	A	43	1	43	12	Section 6.6. Many adaptation papers and topics such as 'fuzzy conservation' and	Ch 17 deals with adaptation in general; Ch 6

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391						emerging EU policies on Marine protected areas NOT being designated based on species (in recognition of their dynamics and likely range shifts in response to climate change) need to be highlighted. Similarly, the concepts of institutional adaptation and public participation in decision-making needs to be highlighted. Research from the Tyndall centre for climate change research could be cited, along with the OST foresight programme. (Larissa Naylor, Environment Agency & University of East Anglia)	has to focus on adaptation related to coastal and low lying areas; comments have been addressed to the extent that space allows.
E-6-392	A	43	3	43	3	Insert after traditional practices, including floating or hydroponic culture (Haq et al 2005), can be …….. (Rafiqul M. Islam, Integrated Coastal Zone Management Program)	
E-6-393	A	43	6			section 6.8: possible inclusion: research on behaviour of natural coastal marine systems (population dynamics, impacts on ecological dominant species) (Silvia Llosa, ISDR System)	These more generic points are made in Ch 17.
E-6-394	A	43	16	43	17	"As recognised in earlier IPCC assessment and recalled in the recent Millenium Ecosystem Assessment (2005), …" (Yves Henocque, Department of Fisheries)	Addressed.
E-6-395	A	43	17	43	17	change the word "general" to "generally" (Donald Cahoon, Patuxent Wildlife Research Center)	Addresssed.
E-6-396	A	43	17	43	17	…drivers generally exacerbate… (Bhawan Singh, Universty of Montreal)	Ditto.
E-6-397	A	43	17			in general for 'general' (Peter Saenger, Southern Cross University)	Ditto.
E-6-398	A	43	19	43	37	It would be useful to add a note of the need for institutional strengthening. We need strong systems of planning and zoning, and institutions that can actually enforce these regulations, in order to gradually relocate key transport infrastructure, hotels and leisure facilities and urban settlements out of vulnerable areas. (Anthony Clayton, University of the West Indies)	Addressed. 'Institutional systems in coastal planning and zoning' are included.
E-6-399	A	43	19		37	Are recommendations for research part of this? In any case, these are all rather vague and elementary. 'Develop a better understanding' etc. (Charles Sheppard, Warwick University)	Addressed. 'Research' included as part of the initiatives.
E-6-400	A	43	31	43	31	add 'vulnerability' before assessment (Silvia Llosa, ISDR System)	Addressed.
E-6-401	A	43	35	43	37	possible inclusion: research on coastal governance structures, information for policy-makers (usable, actionable), resolution of conflicts between different uses of coastal services and users, especially addressing uncertainty in decision-making; publication of practical guidelines for coastal management (Silvia Llosa, ISDR System)	Addressed. Governance is included in revision for G-6-398.

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E-6-402	A	44	1	44	1	Cahoon 2003 and Rogers et al. 2005 are cited in the text but not included in the references. (Donald Cahoon, Patuxent Wildlife Research Center)	Agree
E-6-403	A	49	9	49	49	Section 6.6.4 Adaptive capacity It is worth clarifying and making sure that the adaptive capacity (and constraints thereof) of both natural and human systems are illustrated. At present it is largely focussed on human adaptive capacity. (Larissa Naylor, Environment Agency & University of East Anglia)	Agree
E-6-404	A	51	29	51	29	Insert reference " Haq A. H. M. R., T. K. Ghosal, P. Ghosh & M. A. Islam (2005) Wise Use of Wetland for Sustainable Livelihood through Participatory Approach: A Case of Adapting to Climate Change. Wetland Science 3.3: 161-166." (Rafiqul M. Islam, Integrated Coastal Zone Management Program)	Considered and disagree -- space
E-6-405	A	61	29	61	29	Insert reference " Taniguchi, M. & H. Iwakawa (2004) Submarine groundwater discharge in Osaka Bay, Japan. Limnology 5:25-32." (Rafiqul M. Islam, Integrated Coastal Zone Management Program)	Considered and disagree
E-6-406	A	63	31	63	31	Insert reference " Wei-shiuen N.G. & R. Mendelsohn (2005) The impact of sea level rise on Singapore. Environment and Development Economics, 10:201-215." (Rafiqul M. Islam, Integrated Coastal Zone Management Program)	Considered and disagree

LATE COMMENTS:

E-6-1	LATE	0				General Comment: some of the statements regarding fisheries, impacts and adaptation are simplistic and based on studies focused on limited spatial areas and species ; fish adaptation is not just a matter of moving to warmer water - there are other factors involved; also throughout the chapter there is constant contridictions of what will happen to the fisheries - in one section recruitment in inshore areas will be reduced while in another section fish will increase in abundance. Also acidification will negatively impact on all species. So how can abundance increase if recruitment is negatively impacted. I note that this information may be derived from other Chapters and given that sort of information is being presented in other chapters I hope someone with a strong fisheries background is reviewing those chapters. Some statements for aquaculture are also contradicting - if inshore water quality is declining with increased sea level rise then the key factor - good water	Agree – 6.4.2 carefully checked

						quality (or in this case lack of) will constrain expansion. (Jacqueline Alder, Fisheries Institute, UBC)	
E-6-2	LATE	3	31			Could add coral survival/ adaptation not as fast as with fish etc. it varies with temperature. (Jacqueline Alder, Fisheries Institute, UBC)	Agree – coral is a major theme in chapter – including Box 6.1
E-6-3	LATE		43			could add fisheries and links to food security	Where? Cannot respond.
E-6-4	LATE	5	13			Tsunamis are included, yet no discussion in upwellings - these are critical to small pelagic fisheries which currently account for nearly 30% of world fish landings. (Jacqueline Alder, Fisheries Institute, UBC)	Oceanic issue which we are explicitly NOT addressing.
E-6-5	LATE	7	6			Also upwellings which ultimately affect coastal fish production as well as seaabird and marine mammals reproduction success especially in Peruvian and Benguela. (Jacqueline Alder, Fisheries Institute, UBC)	Oceanic issue which we are explicitly NOT addressing.
E-6-6	LATE	7	18			Consider including densest populations around deltas which are some of the most vulnerable places. (Jacqueline Alder, Fisheries Institute, UBC)	See Box on deltas – and Section 6.4.3
E-6-7	LATE	11	21			Aquaculture - suggest aquaculture largest in A1, second largest in A2, then B1 and B2 smallest. (Jacqueline Alder, Fisheries Institute, UBC)	Disagree we can resolve – no change
E-6-8	LATE	17	43			increased algal blooms - where system is N limited. (Jacqueline Alder, Fisheries Institute, UBC)	Space consideration
E-6-9	LATE	19	36			Consider noting link between mangroves and coral reef fish. (Jacqueline Alder, Fisheries Institute, UBC)	Space consideration
E-6-10	LATE	28	28			Climate variability and change is NOT recognized as a MAJOR factor affecting fisheries abundance! It is A factor, and there is considerable debate how important a factor it is. There is no question that overfishing is the major factor. Also it is FISH abundance. (Jacqueline Alder, Fisheries Institute, UBC)	Addressed (should be page 24). Climate change is a major factor in the geographical movements of fisheries. Overfishing and other non-climate change factors included in this section.
E-6-11	LATE	28	41			Overexploitation of inshore areas threatens Europe - look at most ICES fish stock status reports, salmon stocks in Europe, cod stocks etc. The same for Africa, see www.seaaroundus.org - West Africa study. (Jacqueline Alder, Fisheries Institute, UBC)	Addressed (should be page 24). All examples have been deleted.
E-6-12	LATE	28	24			What about the huge 'snowbird' migration from Canada and northern US to the southern US states every winter. (Jacqueline Alder, Fisheries Institute, UBC)	Addressed. Gobally, this is much smaller compared to Europeans going to the Mediterranean.
E-6-13	LATE	34	15			Year round uses of fishing vessels can only exacerbate overfishing and the burning of fossil fuels and ultimately greenhouse gas emmissions. Ulness alternative to fishmeal and fishoil found aquaculture will be limited for carnivorous fish which is where the growth in this sector has been in the last decade at least. (Jacqueline Alder, Fisheries Institute, UBC)	Agree – but no space to add.
E-6-14	LATE	36				Start of sentence does not make sense to me. (Jacqueline Alder, Fisheries Institute, UBC)	Where? Cannot respond.