

#	Ch	From Page	From Line	To Page	To Line	Comment
1	23	0	0	0	0	My previous comments (from chapters 5 and 6) should be also considered in this chapter about Europe (LLORET, JOSEP, UNIVERSITY OF GIRONA)
2	23	0	0	0	0	This is a well thought out and elaborated document that fully addresses its mission. At the same time, it seems appropriate to take into account in its final version the latest EEA report: 'Adaptation in Europe: Addressing risks and opportunities from climate change in the context of socio-economic developments'. Available at: http://www.eea.europa.eu/publications/adaptation-in-europe (Trombitsky, Ilya, Eco-TIRAS International Environmental Association of River Keepers)
3	23	0	0	0	0	The chapter provides highly valuable information on observed climate trends and future projections in Europe. There is a strong need to integrate in the chapter such information as: a) transport sector in Europe; b) changes in land use/land cover (see CORINE); c) "environment/climate change" dimension in the new Common Agricultural Policy, the new Common Fisheries Policy, the European communication for low carbon economy by 2050, the 20-20-20 strategy and the road map for a resource efficient Europe. Such information links to the production and consumption patterns in Europe, thus affecting the resilience to climate change impacts. Overall a discussion on the potential of current European strategies to reduce GHG emissions and to advert climate change in Europe is also necessary. (Constantinos Cartalis, Environmental Physics, University of Athens, Greece) (GREECE)
4	23	0	0	0	0	Chapter 23 is soundly structured, well written and thoroughly documented. (Danae Diakoulaki, Chemical Engineering, NTUA, Greece) (GREECE)
5	23	0	0	0	0	There are several overlaps with other chapters. (Danae Diakoulaki, Chemical Engineering, NTUA, Greece) (GREECE)
6	23	0	0	0	0	It appears to me that some parts of this chapter do not go as deep as they should. I am referring to all parts having to do with cities, settlements, land use and spatial planning. The impression I have is that these parts were based on partial and incomplete literature review. In my opinion the best solution would be to remove these parts from chapter 23 so that they appear only in chapter 8 where they are addressed properly. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
7	23	0	0	0	0	One of the impacts of climate change to water resources would be the increase in temporary rivers. River flow temporariness affects not only the availability of water seasonally but also the ecological status of the river, the way that rivers should be monitored regarding water quality and biology and in general the way rivers should be managed. Many areas in Europe that had low fraction of the river network to be temporary will have increases in temporariness that will be coupled with increases in irrigation needs. This was the subject area of research of the MIRAGE project and the results regarding policy issues have been summarized in the Nikolaidis et al. 2013 manuscript. It would be important to be emphasized that the irrigated land in Europe will increase northward while a significant length of the river network will become temporary, causing water deficits that would need to be managed. 1. Nikolaos P. Nikolaidis, Leeda Demetropoulou, Jochen Froebrich, Claire Jacobs, Fransesc Gallart, Narcis Prat, Antonio LoPorto, Vassilis Papadoulakis, Claudia Campana, Nikolaos Skoulidakis, Thierry Davy, Giovanni Bidoglio, Faycal Bouraoui, Mike Kirby, Marie-George Tournoud, Stefano Polesello, Gonzalo González Barberá, David Cooper, Rosa Gomez, Maria del Mar Sanchez, Anna-Maria De Girolamo, 2013. Towards a sustainable management of Mediterranean river basins - Policy recommendations on management aspects of temporary river basins, Water Policy (In Press). (Nikolaos Nikolaidis, Environmental Engineering, Technical University of Crete, Greece) (GREECE)

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8	23	0	0	0	0	This Chapter has a wide scope and its realisation requires considerable effort. It has a comprehensive structure. However, three issues may be addressed more carefully: 1. The health impacts section needs to include data from a few European projects that are not mentioned; 2. For some consequences of climate change there had been projections for time periods, or time points prior to 2013. Have these been realized or not? 3. For the co-benefits, a special section on the air pollution issue is needed. (Klea Katsouyanni, Hygiene, Epidemiology and Medical Statistics, University of Athens Medical School, Greece) (GREECE)
9	23	0	0	0	0	This chapter should be carefully checked. Citations are inserted in the text in whatever way, consecutive references also, italics are not used when needed and in accordance to other chapters/subchapters, the issue of brackets within brackets is open, space is added between number and % on many occasions, units for temperature are written in various ways, punctuation is missing or added in an inappropriate way (even leading to misunderstandings), etc. (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
10	23	0	0	0	0	My major comments regarding this chapter concern adaptation measures for forests, the ability of Natura 2000 network to ensure conservation of species, and the increased pollen concentrations in the air that may affect human health. (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
11	23	0	0	0	0	It would be very useful for the reviewer to see the figures and tables of the report at the point of citation. The figures and the tables are presented at the end of draft report. (Athanasios Loukas, Civil Engineering Department, University of Thessaly, Greece) (GREECE)
12	23	0	0	0	0	There is not even a single reference to active solar thermal systems for heating, domestic hot water and solar air-conditioning. Similarly for building integrated photovoltaics.(Costas Balaras, Institute for Environmental Research and Sustainable Development, National Observatory of Athens, Greece) (GREECE)
13	23	0	0	0	0	A series of projections are given in this chapter, without specifying the considered time horizon or the scenario. I would suggest to add a general comment in the introduction how to interpret these results. (Ferrone, Andrew, Public Research Centre - Gabriel Lippmann)
14	23	0	0	0	0	The chapter has significantly improved compared to the first order draft. It is generally in a good shape. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
15	23	0	0	0	0	We recommend the authors to revise the text on the full EU Adaptation Strategy package, where there is abundant background information on climate change impacts, vulnerabilities and adaptation options, including on many socioeconomic sectors. Information on current adaptation mainstreaming action (e.g. into EU funds) can also be relevant. (http://ec.europa.eu/clima/policies/adaptation/what/documentation_en.htm) (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
16	23	0	0	0	0	The text should be revised to substitute all references to forthcoming EU Adaptation Strategy with up-to-date information of the effective adoption (April 2013) and its contents. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
17	23	0	0	0	0	The vulnerabilities of complex systems in Europe, such as cities and mountain areas, would deserve specific attention in the report. These, together with coastal areas, tourism, etc, are good examples of complex vulnerability factors and should be dealt with appropriately. Some times the approach continues to be quite simple and unidimensional, hampering a more comprehensive and realistic approach to the actual challenges, tradeoffs, intersectoral linkages, etc. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)

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18	23	0	0	0	0	The references "EEA, 2008" and "EEA-JRC-WHO, 2008" refer to the same publication. The correct reference is "EEA-JRC-WHO, 2008", and all references to "EEA, 2008" should be replaced by the correct one. Furthermore, the report referred to in "EEA-JRC-WHO, 2008" has been updated and extended by "EEA, 2012". Whenever appropriate, references to "EEA-JRC-WHO, 2008" should be changed to "EEA, 2012" rather than keeping the outdated reference. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
19	23	0	0	0	0	Please add a introduction to the difference between change for Europe based on SRES and RCPs. please add a clear differentiation between results based on SRES and results based on RCPs. (Kreienkamp, Frank, Climate & Environment Consulting Potsdam GmbH)
20	23	0	0	0	0	There is a disparity in the quality of writing in the different sections, with some sections e.g. 23.2.2.2; 23.2.3 for example needing more text to pull the examples/citations together and provide a more coherent explanation of their findings. (Berry, Pam, Oxford)
21	23	0	0	0	0	This is a general comment not limited to chapter 23, but mentioned here because this is the regional chapter I had most time to look at for the review. The treatment of observed impacts (including detection and attribution) is patchy in this chapter, and the responsibility for reporting European observed impacts seems to be unclear. Should these be done comprehensively here or in Chapter 18? Currently, there is a useful Table here (23-6) which attempts to synthesise observed impacts and their attribution to changes in climatic factors. One wonders how much time and effort was possible among the author team to construct this table, how comprehensive the review can have been (rather few references are given), whose expert judgement is used to come up with the conclusions given (does the author team possess such expertise across all these sectors?), and how much dialogue there has been with the other core thematic chapters and particularly with Chapter 18. (Carter, Timothy, Finnish Environment Institute)
22	23	0	0	0	0	Chapter 23 looks well arranged ind includes many evaluation that would be important for decision making at national level. In general it demonstrates a deficit of relevant studies out the European Union space that is also the matter of decision making in countries. (Andreev, Alexei, BIOTICA Ecological Society)
23	23	0	0	0	0	A visible discrepancy between IPCC sub-regions and EEA-derived European biogeographical regions with regard to Continental sub-region highlights the strong lack of assessments and citations from the Eastern Europe. That creates significant uncertainty for IPCC evaluations especially with regard to agriculture, forestry and biodiversity. The major reasons for that are: 1) climate of the IPCC Continental sub-region is very diverse (from semiarid steppic parts to quite humid forest areas); 2) varying landscape transformation (from the heavily changed southern agricultural zone up to relatively conserved and extended forests and meadows northwards) creates absolutely different backgrounds for ecosystem self-adaptation through shifts of species composition, which may be stagnated or relatively quick in different parts of the subregion, as well as for adaptation in agriculture, forestry and infrastructure in nature. (Andreev, Alexei, BIOTICA Ecological Society)
24	23	0	0	0	0	[The following message came via wg2-ar5-supportingmaterial@ipcc-wg2.gov: \n "There is attached file of the article cited in WGII-AR5-SODreview_Andreev_MD.xls subitted on 2013-05-24 (Reviewer Id: 2742): \nAndreev, A.V., 2011: Factors of probable future changes of (sub)natural ecosystems, linked with climate change. [Trombitsky, I. and Corobov R. (ed.)]. Transboundary cooperation in climate change adaptation of the Dniester River basin. Collection of scientific articles. Kishinev: ECO-Tiras. P. 8-20. [In Russian. Hopefully it may be interesting." -- the article can be found in supporting material page on the WGII author portal] (Andreev, Alexei, BIOTICA Ecological Society)
25	23	0	0	0	0	Numerous publications in Russian concerning climate change impacts on water resources, agriculture and forest systems are ignored. This contradicts with the guidelines of the IPCC Plenary on the wider use of non-English literature. (RUSSIAN FEDERATION)

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26	23	0	0	0	0	The authors refer to the EU White paper on adaptation to climate change. They conclude that this is not implemented yet within the EU Rural Development Policy. We acknowledge that statement for this is related to the policy life cycle phase of the Common Agricultural Policy (CAP). Climate change however is acknowledged as an important and major challenge the current reform of the CAP has to address in an appropriate way. We recommend that IPCC focus on the implementation of climate change within the new CAP for the period 2014-2020;\n\nIn general the IPCC-report underlines the main policy objectives of the reform of the CAP: more targeted direct payments, rewarding the delivery of above-statutory public services, increase the competitive strength, the sustainability and innovation of the European agriculture. However we would appreciate when IPCC-reports could give more evidence base of the impact of these objectives;\n\nClimate change and agriculture within the reform of the CAP are addressed by:\n1. Greening of direct payments, which will be compulsory for farmers;\n2. Rewarding farmers for the delivery of public goods within the first pillar, but in the second pillar as well through agri-environmental measures;\n3. Specific (financial) emphasis on adequate agri-environmental climate measures (AECM) in the future European Rural Development Programmes 2014-2020 that have to be implemented by the EU Member States. \n\nWe recommend that IPCC will report on the achieved environmental impact and performance by agriculture. \n\n(NETHERLANDS)
27	23	0	0	0	0	It would be worth emphasizing that the high population density of Europe predisposes the continent to increased vulnerability to the effects of climate change. Less than optimal places have been developed - places that are more susceptible to flooding for example. The landscape has been altered, leaving places more susceptible to extreme erosion, etc. G. P. Marsh pointed this sort of thing out in his seminal classic, "Of Man and Nature". It is not just a matter of climate change. (UNITED STATES OF AMERICA)
28	23	0	0	0	0	Please explain what was the rationale used to select the different base periods (e.g, 1850-1899) across the chapter, and why there is not only one consistent base period for all analysis presented. (UNITED STATES OF AMERICA)
29	23	0	0	0	0	Since so many people in Europe live in urban setting, and since so many urban settings are vulnerable to flooding and other climate-enhanced perils, the report would benefit from a special section (a Box perhaps?) summarizing urban risks and urban areas that are particularly vulnerable. (UNITED STATES OF AMERICA)
30	23	0	0	0	0	The authors should consider an enhanced focus on near term climate change, i.e. 2030s and 2040s. Stakeholders are more likely to react to research that is focused on conditions closer to the present. (UNITED STATES OF AMERICA)
31	23	0	0	0	0	The content of the chapter is exceptionally inconsistent in the level of details, in style and nature from one subsection to another. Some subsections are so heavily laden with citations that they are nearly impossible to read, while other sections are written almost exclusively in bullet point format. The current process of displaying (multiple) references within the text creates difficulties when trying to follow the flow of the sentence. To improve consistency and readability, it would be helpful to have some more homogenization of the writing style. The chapter needs to be scientifically rigorous, and not just a litany of what amount to being bullet points. Every paragraph needs a strong topic sentence, and the paragraph itself should be consistent in keeping to that topic, with perhaps a transitional statement at the end. A review and consolidation of format, style and voice would make this chapter substantially more useful to a broader audience. The synthesis subsection ought to be written in a manner in which it can be used as a stand-alone summary of this particular chapter. This piece would then be more useful for communication efforts with policymakers, the general public and individuals with less technical expertise or knowledge than the chapter's authors. Clearly, both the executive summary and the synthesis findings subsections may be modified so that they can be used as stand-alone documents for those needing an abridged version of the chapter. These in particular should be written to certain standard that convey content in a manner that corporate leaders, policymakers, members of the press and the general community will be able to digest. (UNITED STATES OF AMERICA)

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32	23	0	0	0	0	The current document is more easily understood by a technical audience and lacks explanation of technical terms, model acronyms, and other. For example, a concrete definition of SREX is needed in this chapter. It is referenced repeatedly but never really has a starting definition. (UNITED STATES OF AMERICA)
33	23	0	0	0	0	The discussion of sectoral impacts consists of a large number of very detailed and focused statements without an apparent higher level context. It could be improved with an overview at a higher level at the beginning followed by sub-topic lead in statements introducing specific impact statements at the sector level (e.g., energy production in Europe will be negatively affected on a regional basis followed by some or all of the specific statements contained). A summary of important impacts which are not expected nor considered would be helpful. (UNITED STATES OF AMERICA)
34	23	0	0	0	0	The Introductory paragraphs and Section 23.1 indicate the chapter reviews published evidence of anthropogenic climate change in Europe and adaptation responses and that it summarizes the latest scientific evidence on climate sensitivity, observed impacts and attribution, and the projected impacts and adaptation options. Indeed, there are statements on all these areas. There is much on observed climate change without apparent focus on anthropogenic climate change in other than, for example, statements like "attribution of local warming to anthropogenic climate change is less certain". Discussion of adaptation responses is too brief and misses an opportunity to provide information governments can use to mitigate negative trends and thereby reduce negative societal impacts. (UNITED STATES OF AMERICA)
35	23	0	0	0	0	The narrative of this chapter is very focused on identifying the negative impacts of climate change. To balance the perspective, it may be helpful to address also the positive impacts or opportunities that will emerge from those changes. Perhaps the focus on positive impacts is not in the scope of this document, but it should be clearly stated, if not already somewhere else. (UNITED STATES OF AMERICA)
36	23	0	0	0	0	The number of simulations (9 & 20) used to draw conclusions about trends and impacts seems small at first glance, and the number chosen should be explained. (UNITED STATES OF AMERICA)
37	23	0	0	0	0	The report seems ready to favor the proposition that virtually all climate effects will be negative. To be sure, many of them will be, but it is not inconceivable that some will be positive. This potentially hurts the credibility of the report and makes it unduly vulnerable to criticism. (UNITED STATES OF AMERICA)
38	23	0	0	0	0	The summary statements about negative climate trends and their impact on various sectors are good but little is said about how the data support these statements. The text would have greater impact on readers with some linkage to the data justifying the summary statements. Figures and tables are presented as justification for many of the trend and impact statements without discussion of how data in them support the statements. There is little narrative in the chapter that interprets the tables and figures therein. In the interest of space it is not possible to have a full explanation for each figure. Nonetheless, if the table or figure is relevant enough to be in the chapter, then an adequate caption and substantial content in the narrative are necessary, especially a discussion of specifics in the figures which address why the data show a particular trend or impact. (UNITED STATES OF AMERICA)
39	23	0	0	0	0	There are significant differences between figures drawn from the 9- and 20-simulation studies. Some discussion of key differences and whether or not they affect the authors' overall conclusions would strengthen the document. (UNITED STATES OF AMERICA)
40	23	0	0	0	0	Throughout the document, "confidence" levels are expressed (high confidence, medium confidence and low confidence). It should be made clear what the criteria are for determining which level is assigned. Was this based on a parametric measure, a vote of the the various authors, or some other criteria? Incorporate the figure from the Uncertainty Guidance at the beginning of this chapter. (UNITED STATES OF AMERICA)

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41	23	0	0	0	0	Figure 23-1: There is a reasonably large latitudinal difference or spread (approximately 45N to 70N or 25 degrees latitude) between the regions classified as Alpine. As perhaps a minor point, with global climate change, the changes affecting the global general circulation could impact the northern and southern alpine regions differently. The present classification is presumably based more on temperature and altitude than latitude. Perhaps some explanation could be provided as to whether the general atmospheric circulation in European region is expected to remain approximately the same and that the temperature and precipitation effects due to climate change is comparable in all the alpine sub-regions as depicted in Fig 23-1. To be noted, many of the tables in Ch-23 map changes in accord with this classification. The question is whether this broad brush classification based on present climate and vegetation distribution patterns is adequate or for that matter appropriate? (UNITED STATES OF AMERICA)
42	23	0	0	0	0	Lack of adaptation strategies regarding wildfires. Examples of ecosystem based approaches to adaptation might include management of fire-prone ecosystems to achieve safer fire regimes while ensuring the maintenance of natural processes and preservation of biodiversity.\n (Moreira, Bruno, Centre for Functional Ecology - University of Coimbra)
43	23	0	0	0	0	Impacts of projected change on temperature and precipitation on fuel accumulation and relation to fires are poorly discussed. (Moreira, Bruno, Centre for Functional Ecology - University of Coimbra)
44	23	0	0	0	0	There is no reference to post-fire restoration strategies (conserve biodiversity) or prevention strategies (e.g., the use of prescribed burning to reduce fuel loads) for adaptation. (Moreira, Bruno, Centre for Functional Ecology - University of Coimbra)
45	23	0	0	0	0	Will climate change and fire have impacts on vegetation communities and biodiversity? Is there any spatial (regional) variability on these effects (e.g., negative or positive implications in different regions)? Discuss this point (Moreira, Bruno, Centre for Functional Ecology - University of Coimbra)
46	23	0	0	0	0	Any suggestion to deal with fire management under climate change? (Moreira, Bruno, Centre for Functional Ecology - University of Coimbra)
47	23	0	0	0	0	What will be the effects of climate stresses on biodiversity and ecosystem services? (Moreira, Bruno, Centre for Functional Ecology - University of Coimbra)
48	23	0	0	0	0	typo: in all chapter, when two consecutive referecnes are present, each one is inserted between bracket, with a style different than in previous chapters. So change from "(Author 1 et al, YEAR)(Author2 et al., YEAR)" in "(Author 1 et al, YEAR; Author2 et al., YEAR)" (Cassardo, Claudio, University of Torino)
49	23	0	0	0	0	In some aspects the health chapter (11) seems to be more detailed on issues that are relevant for Europe (e.g. heat-waves and health adapation to heat-waves); maybe reference could be made to chapter 11? For example on page 27, line 14 refer to chapter 11, from page 28, line 51 to page 29, line 11 for more detail. (Matthies, Eva Franziska, Consultant)
50	23	0	0	0	0	Add reference: Vardoulakis S., Heaviside C. (Eds), 2012. Health Effects of Climate Change in the UK 2012 – Current evidence, recommendations and research gaps. Health Protection Agency. Centre for Radiation, Chemical and Environmental Hazards, UK. (Vardoulakis, Sotiris, Health Protection Agency)
51	23	0	0	0	0	Both very balanced, comprehensive and clear (partly table overloaded, but text clear) (Schwarze, Reimund, Helmholtz Leipzig)
52	23	0	0	0	0	1) Overall -- The chapter team has developed a robust, comprehensive 2nd-order draft. In the final draft, the chapter team is encouraged to continue its prioritization of compact and rigorous assessment, clear writing, and high specificity. (Mach, Katharine, IPCC WGII TSU)
53	23	0	0	0	0	2) Coordination across Working Group II -- In developing the final draft of the chapter, the author team should continue to ensure coordinated assessment, both in the chapter text and at the level of key findings. As appropriate, cross-references to the sections of other chapters and/or their assessment findings should be used, ensuring that overlaps are reduced and assessment harmonized. (Mach, Katharine, IPCC WGII TSU)

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54	23	0	0	0	0	3) Harmonization with the Working Group I contribution to the AR5 -- In developing the final draft, the chapter team should also ensure all cross-references to the Working Group I contribution are updated, with discussion of climate, climate change, and climate extremes referencing the assessment findings in that volume. (Mach, Katharine, IPCC WGII TSU)
55	23	0	0	0	0	4) Report release -- The chapter team should be aware that the final drafts of the chapters will be posted publicly at the time of the SPM approval, before final copyediting has occurred. Thus, the chapter team is encouraged to continue its careful attention to refined syntax and perfected referencing. (Mach, Katharine, IPCC WGII TSU)
56	23	0	0	0	0	5) Shortening and tightening the assessment -- The chapter team should continue to condense the assessment as much as possible, aiming for example to reduce the text of the chapter by 10 pages. (Mach, Katharine, IPCC WGII TSU)
57	23	0	0	0	0	6) Characterization of future risks -- In characterizing the future risks for Europe, to the degree appropriate the chapter team should indicate the extent to which risks (or key risks) can be reduced through mitigation, adaptation, development, etc. That is, how may risks increase as the level of climate change increases, and is it possible to indicate the relative importance of changes in mean conditions, as compared to changes in extreme events, as compared to potential non-linear changes associated with biome shifts or tipping points? And then, how much can these risks be reduced through adaptation or development, in the near-term and long-term? How are factors or stressors that multiply risks relevant in this context? As supported by its assessment of the literature, and potentially building on table 23-4, the author team should consider communicating risks for the era of climate responsibility (the next few decades, for which projected temperatures do not vary substantially across socioeconomic/climate scenarios) and for the era of climate options (the 2nd half of the 21st century and beyond). As might be helpful to the chapter, the framing of table SPM.4 could be considered in characterization of future risks, along with the key and emergent risk typology of chapter 19. (Mach, Katharine, IPCC WGII TSU)
58	23	0	0	0	0	7) Informing the summary products -- To support robust and insightful summary products for the report, the chapter team is encouraged to maximize nuance and traceability in its key findings, continuing to use calibrated uncertainty language effectively. In addition to nuanced characterization of future risks (see the previous comment), the chapter team is encouraged to consider themes emerging across chapters, indicating for example how extreme events have demonstrated adaptation deficits and vulnerabilities to date and may relate to future risks, how limits to adaptation may be relevant in the context of this chapter, how multidimensional inequality is relevant in the context of climate change, how adaptation experience has been relevant to date, and how interactions among mitigation, adaptation, and sustainable development may occur. (Mach, Katharine, IPCC WGII TSU)
59	23	0	0	0	0	8) Calibrated Uncertainty Language -- All calibrated uncertainty language used in the chapter, including summary terms for evidence and agreement, levels of confidence, and likelihood term should be italicized. Additionally, wherever possible they should be presented parenthetically at the end of sentences to enhance directness of wording. (Mach, Katharine, IPCC WGII TSU)
60	23	0	0	0	0	GENERAL COMMENTS: I congratulate the author team for all their work on an interesting and informative SOD. When considering the suite of review comments, please look for opportunities to continue to hone and focus the text in revision even further. Please see my detailed comments for suggestions related to specificity of ES findings and traceable accounts, refining figures and tables, and specific clarifications. In addition, where likelihood terms are used ("likely," "very likely," etc.), it is also not always clear whether they are intended as calibrated language or not--please carefully check this and avoid casual usage. (Mastrandrea, Michael, IPCC WGII TSU)

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61	23	0	0	0	0	SUMMARY PRODUCTS: In preparing the final draft of your chapter and particularly your executive summary, please consider the ways in which your chapter material has been incorporated into the draft SPM and TS. For Chapter 23, this includes presentation of observed impacts and vulnerabilities in section A.i, adaptation experience in section A.ii, sectoral and regional risks in section C.i, and interactions between adaptation and mitigation in section D.ii, as well as related figures and tables. Are there opportunities for presenting chapter findings and material in a way that further supports broad themes highlighted in the summary products and that facilitates additional cross-chapter synthesis in specific findings or figures/tables? Do the existing summary product drafts suggest additional coordination that should occur between Chapter 23 and other chapters at LAM4? (Mastrandrea, Michael, IPCC WGII TSU)
62	23	0	0	0	0	Yet another Chapter that is unable to notice that there has been no increase in temperature for 15 years and therefore all the "projections" are wrong. Since the record you use has an upwards bias the globe is actually cooling and this is seen with the persistent cold winters which you seem incapable of recognizing despite the bad effects which are much worse than the claimed warming. Also there is no evidence that the sea level is rising if you judge it from recent more reliable measurements (Gray, Vincent, Climate Consultant)
63	23	1	1	1	1	The tile "Europe" is hanging. Let the title capture the spirit of the underlying text in the entire document. In other words, the title always prepares the reader what he expects in the text of the document (KENYA)
64	23	2	10	2	10	Does not seem right to place "cultural heritage and landscapes" under "health and social welfare". Unclear association. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
65	23	2	50	0	0	Format of the Executive Summary -- The chapter team is strongly encouraged to structure the executive summary so that each paragraph presents a key finding in bold text with calibrated uncertainty language followed by non-bold supporting text. Additionally, all calibrated uncertainty language used should be italicized for clarity and placed within parentheses for directness of wording wherever possible. (Mach, Katharine, IPCC WGII TSU)
66	23	2	50	0	0	Key Regional Risks in the Executive Summary -- In tightening and focusing the executive summary, the chapter team should consider its presentation of key risks and projected outcomes as a guide for prioritizing material while condensing and reducing overlap. Even more than already done, it would be great if the author team could emphasize the key risks for the region, with physical hazards, exposure, and vulnerability as determinants of the risks. How do the risks change as the level of climate change increases? What is the potential for risk reduction through adaptation? How do risks differ in the near-term (which can be considered an era of climate responsibility) and in the long-term (which can be considered an era of climate options)? (Mach, Katharine, IPCC WGII TSU)
67	23	2	50	0	0	Executive Summary: Calibrated uncertainty language is needed throughout the executive summary and must be added in the final draft of the chapter. Please integrate overlapping material into a shorter set of paragraphs formatted with bold findings supported by nonbold additional information, retaining the careful use of calibrated uncertainty language and line of sight to chapter sections already employed. To the extent possible as supported by the literature, please emphasize what risks are projected to emerge over different time horizons (e.g., mid-century vs. end-of-century), as well as the potential or lack of potential for mitigation and adaptation to reduce them. Section 23.10.1 provides useful information that overlaps with the executive summary as well. Please consider how these presentations interact. (Mastrandrea, Michael, IPCC WGII TSU)
68	23	2	50	5	43	The drastic changes in high mountain landscapes - glacier landscapes to be replaced by rock/debris/lake landscapes with long-lasting disequilibria in vegetation, erosion/sedimentation and slope stability, causing strong effects on (seasonal) water supply, hydropower, tourism, hazard prevention and landscape protection - should be mentioned. The absence of any mentioning of the highly sensitive high mountain ranges in the executive summary is astonishing - did I overlook something? (Haeberli, Wilfried, University of Zurich)

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69	23	2	52	5	43	Why is there, in contrast to the other chapters, no bold highlighting of key information in this executive summary? Please highlight the key findings in executive summary (as in other chapters). (GERMANY)
70	23	3	1	3	5	sea rise is missing here. It appears latter and explained even later which is a sign of bad structure. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
71	23	3	1	3	5	and fires? (Moreira, Bruno, Centre for Functional Ecology - University of Coimbra)
72	23	3	1	3	13	The sentences on lines 1-2 and 12-13 are overlapping and could be condensed. (Mach, Katharine, IPCC WGII TSU)
73	23	3	2	3	2	Meteorological droughts (medium confidence) and heavy precipitation events (high confidence) in Europe are not considered in the TS (e.g. under specific regional examples (p.8, l.50) or in Table TS.1.(p.86) (GERMANY)
74	23	3	2	3	2	ExSum: "meteorological drought (medium confidence)", section 23.2.2.3 does not provide information on meteorological drought, source of this information is unclear\n\n (NETHERLANDS)
75	23	3	2	3	2	ExSum: "meteorological drought (medium confidence)", section 23.2.2.3 does not provide information on meteorological drought, so why "medium confidence"? \n\n (NETHERLANDS)
76	23	3	3	3	3	"[high confidence]". These expressions make the text unreadable. The same effect could be achieved by using consistent statements of plane text such as for example "and most probably heavy precipitation events". A number of similar instances exist in this chapter. I would also say that statements supported by weak evidence should not make it to the text at all. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
77	23	3	4	3	5	The reference to wind can be deleted. In page 9 (lines 41-42), the report indicates projected wind speeds are uncertain due to shortcomings in wind simulation. Other indices that are better simulated (snow cover, aridity, humidity?, tropical nights...) could be worthy instead of wind (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
78	23	3	5	3	5	Is there any evidence of a change in the distribution of wind directions? (Ciavola, Paolo, University of Ferrara)
79	23	3	7	0	7	Climate change cannot affect composition of animals and plant species; it can affect composition of animal and plant communities. (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
80	23	3	7	3	7	The word "composition" could be perhaps clarified. Composition of species could potentially be interpreted as a physiological trait rather than an ecological outcome. (Mach, Katharine, IPCC WGII TSU)
81	23	3	8	3	8	Is it possible to specify the most relevant crop types here? (Mach, Katharine, IPCC WGII TSU)
82	23	3	9	3	9	ExSum: "health, particularly in Southern Europe": Section 23.5.1 only discusses potential climate change impacts in the future, not observed climate change impacts in the past\n\n (NETHERLANDS)
83	23	3	9	3	9	It would be preferable to specify which kinds of health impacts have already been observed. (Mach, Katharine, IPCC WGII TSU)
84	23	3	9	3	10	This statement should be revised. As explained elsewhere, recent studies show a different pattern: non-significant trend in the number of fires since 1986 in Mediterranean Europe, and significant decrease in the last decade. Also a significant decrease in area burnt over the whole period. Jesús San-Miguel-Ayanz , Marcos Rodrigues , Sandra Santos de Oliveira, Claudia Kemper Pacheco , Francisco Moreira , Beatriz Duguy and Andrea Camia (2012). Land Cover Change and Fire Regime in the European Mediterranean Region. Chapter 2 in F. Moreira et al. (eds.), Post-Fire Management and Restoration of Southern European 21 Forests, Managing Forest Ecosystems 24, Elsevier. DOI 10.1007/978-94-007-2208-8_2 (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
85	23	3	11	3	11	ExSum: "European cultural heritage", section 23.5.4 only discusses potential climate change impacts in the future, not observed climate change impacts in the past\n\n (NETHERLANDS)

#	Ch	From Page	From Line	To Page	To Line	Comment
86	23	3	11	3	12	Table 23.3 which is referenced here does only partly show information on observed vulnerability. Following the table caption it shows future adaptation costs. It is not clear what is meant here. Please adjust the reference or the figure caption. (GERMANY)
87	23	3	12	3	12	Reference to Table 23.3 not correct, should be Table 23.5? (NETHERLANDS)
88	23	3	12	23	15	This statement is a projection, not an observed impact. It can be linked to paragraph starting in line 21 (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
89	23	3	13	3	15	with adverse implications for ... labour productivity, and ...: adverse effects of heat waves on labour productivity is nowhere mentioned in Ch.23, remove statement? (NETHERLANDS)
90	23	3	13	3	15	with adverse implications for ... , not only adverse effects, suggest to change to "with mostly adverse implications for ..." (NETHERLANDS)
91	23	3	13	3	15	with adverse implications for ... built environment., not in all regions of Europe, suggest to change to "with mostly adverse implications for ... built environment in most regions of Europe." (NETHERLANDS)
92	23	3	13	3	15	with adverse implications for ... built environment (Table 23.4)., also include reference to sections 23.3.2, 23.3.3, 23.3.4, 23.3.6, 23.4.1, 23.4.2, 23.4.3, 23.5.1 (NETHERLANDS)
93	23	3	17	0	19	Remove the whole text in brackets. Services written there are found again in the last sentence of the paragraph. (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
94	23	3	17	3	17	Give an example of sector: such as infrastructure, food production etc otherwise it looks like the statement is related to table 23.2 on ecosystem services (NETHERLANDS)
95	23	3	17	3	18	The logic of the start of the sentence could be improved. It asserts that all ecosystem services will be degraded, but the parenthetical listing only provides a subset of the categories of ecosystem services. Given the subsequent sentence, the parenthetical list could be deleted. (Mach, Katharine, IPCC WGII TSU)
96	23	3	17	3	19	Line 19 is a repetition. Put in right order line 17-18 with references of the table (Pechoux, Martin, Institut des Foraminifères Symbiotiques)
97	23	3	17	3	19	It is not clear why "Provisioning, Regulating and Cultural" is mentioned twice. If the *order* of services in the second reference reflects their relative degree of affectedness, this should be stated explicitly. Ecosystem services are also mentioned in page 5, line 19 (some ecosystem service affected, low confidence). Check consistency. It would be useful to have some examples of the kinds of ecosystem services identified (e.g. what is meant by cultural ecosystem services?) (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
98	23	3	17	3	19	Please insert this para in the TS (p.9, l.52). Ratio: to consider the increasing role of ecosystem services in particular with regard to ecosystem based adaptation. (GERMANY)
99	23	3	17	3	19	While this can be derived from the table it needs more supporting text in the relevant section (Berry, Pam, Oxford)
100	23	3	17	3	19	this sentence is a repetition of what said few rows before (Cassardo, Claudio, University of Torino)
101	23	3	17	3	19	The last sentence can be deleted, the services are already given in the prior sentence in just another order. (Rock, Joachim, Johann Heinrich von Thuenen-Institute, Federal Research Institute for Rural Areas, Forestry and Fisheries)
102	23	3	19	3	19	This sentence is not necessary and just repeat the previous one. It does not bring any new information. (NETHERLANDS)
103	23	3	21	3	27	As much as possible, it would be preferable to indicate how these projected risks vary with the level of climate change and with timeframe (near-term versus long-term). (Mach, Katharine, IPCC WGII TSU)
104	23	3	25	3	25	there is more evidence of risks in Northern Europe in several sectors than in the previous assessment AR4 (NETHERLANDS)

#	Ch	From Page	From Line	To Page	To Line	Comment
105	23	3	29	3	30	Where is the text referring to adaptation limits? There is only a Table (page 88, see below) without clear entry point in the report. Some description of these limits would be needed in the report. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
106	23	3	32	3	33	Please make this sentence more clear (UNITED STATES OF AMERICA)
107	23	3	33	3	33	Which studies made an assessment of Climate change on crop yields above 4deg ?\n\n (NETHERLANDS)
108	23	3	33	3	46	The paragraph is not well written. It basically covers flooding (which is not related to the heading - Sectoral Impacts) and then the last sentence jumps to "overheating in domestic housing". (Costas Balaras, Institute for Environmental Research and Sustainable Development, National Observatory of Athens, Greece) (GREECE)
109	23	3	37	3	37	SREX is not in the Bibliography and should be. (UNITED STATES OF AMERICA)
110	23	3	39	3	39	If "likely" is being used as calibrated uncertainty language, reflecting a probabilistic basis for its assignment, it should be italicized. (Mach, Katharine, IPCC WGII TSU)
111	23	3	40	0	40	Please reverse the order of text in brackets: (people affected and monetary losses). (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
112	23	3	41	3	42	it could be made clearer that the projected damages of flooding refer to assessments based on climate projections driven by lower emissions than the current trajectory (same page line 31). (Wolf, Tanja, WHO Regional Office for Europe)
113	23	3	42	3	42	No mention of role of warning systems in mitigating impact, it would be important to refer to work done on storm impacts in FP7. Please refer to:\nCiavola, P., Ferreira, O., Haerens, P., Van Koningsveld, M., Armaroli, C., 2011a. Storm impacts along European coastlines. Part 2: lessons learned from the MICORE project. Environmental Science & Policy 14 (7), 924–933.\n\nCiavola, P., Ferreira, O., Haerens, P., Van Koningsveld, M., Armaroli, C., Lequeux, Q., 2011b. Storm impacts along European coastlines. Part 1: The joint effort of the MICORE and ConHaz Projects. Environmental Science & Policy 14 (7), 912–923. (Ciavola, Paolo, University of Ferrara)
114	23	3	42	3	43	the problem of overheating in domestic housing appears slightly misplaced in this paragraph dealing mainly with flooding. Has it been considered to limit statements in the executive summary to those with high confidence? This way the executive summary seems rather long and wordy. (Wolf, Tanja, WHO Regional Office for Europe)
115	23	3	42	3	43	ExSum Ch.23: "Climate change will increase problems associated with overheating in domestic housing (medium confidence) (section 23.3.2)", confidence level should be "low" (see section 23.3.2: "exactly why and how dwellings currently overheat is uncertain")\n\n (NETHERLANDS)
116	23	3	45	3	46	it is a contradiction not to mention here that sea rise will probably have some affect on coastal areas and hence summer tourism. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
117	23	3	45	3	46	The sentence is difficult to understand due to the combination of two (strong) caveats by "and". Furthermore, the limited knowledge base on the effects of climate change on general tourism (essentially a set of related studies based on the CVI) does not permit such a statement. The limits of the available knowledge base need to be made more explicit here. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
118	23	3	46	3	47	Where the chapter team says "after 2050," is this an outcome projected for high levels of climate change or across scenarios after 2050? (Mach, Katharine, IPCC WGII TSU)
119	23	3	48	3	48	Will should be replaced by "can" when a statement refers to human choices (as it does here). (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
120	23	3	52	3	52	I don't see how accidents will be reduced in south Europe where intense weather events will become more frequent. Explaining more in the text would be valuable to the reader. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)

#	Ch	From Page	From Line	To Page	To Line	Comment
121	23	3	52	3	52	The evidence presented for this statement is very weak. Page 14, lines 30-35 presents a different phrasing, and links reduction in severity to an eventual increased precipitation, which is not the general trends projected. The weight of severe accidents caused by extreme events in overall figures should also be considered. Are these figures relevant at EU level? Are the findings presented useful for the whole Europe, or for a specific region/country, etc.? Presenting this as a general trends does not seem to be very sound. It's possible that climate change may increase accidents in summer - more people travelling to the coast, tired (too much sun), increased alcohol consumption. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
122	23	3	52	3	53	Where the chapter team says "after 2050," are these projected outcomes for high levels of climate change or across scenarios after 2050? (Mach, Katharine, IPCC WGII TSU)
123	23	3	53	3	53	Given that there is no study comparing all inland water ways in Europe I do not see why the Rhine should be mentioned as "particularly" affected. Suggestion: replace "particularly the Rhine" by "on some rivers" or skip this part of the sentence. (GERMANY)
124	23	4	5	4	6	Where the chapter team says "after 2050," is this an outcome projected for high level of climate change or across scenarios after 2050? (Mach, Katharine, IPCC WGII TSU)
125	23	4	6	4	6	small impact: positive or negative? (Cassardo, Claudio, University of Torino)
126	23	4	6	4	7	ExSum Ch.23: "Climate change will inhibit thermal power production during summer", word "inhibit" is too strong, should be "decrease", Ch.23 p.15 line 28-30 mentions a "6-19% decrease of the summer average usable capacity of power plants" and "lower figures have also been estimated"\n\n (NETHERLANDS)
127	23	4	8	4	8	space heating demand: will it mean that there will be need to heat a lower amount of space because climate will be warmer? (Cassardo, Claudio, University of Torino)
128	23	4	8	4	10	The change in climatically determined "cooling demand" should separately more clearly from the change in "cooling service supply", which also considers socio-economic factors such as the prevalence of air conditioning. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
129	23	4	11	4	11	As mentioned later temperature rise reduces energy demand during the winter. This a positive (in economic terms) impact worth mentioning. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
130	23	4	11	4	11	Will should be replaced by "can" when a statement refers to human choices (as it does here). (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
131	23	4	12	4	13	If possible, include a more recent reference on estimates for urbanisation in Europe. (Costas Balaras, Institute for Environmental Research and Sustainable Development, National Observatory of Athens, Greece) (GREECE)
132	23	4	14	4	14	Climate change will change the distribution and seasonal pattern of some human infections, distribution ok, but changes in seasonal patterns are not reported in section 23.5.1.\n\n (NETHERLANDS)
133	23	4	15	0	0	Please add the following phrase: The incidence and prevalence of pollen-related allergy diseases will increase (low confidence) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
134	23	4	15	4	16	Make clear whether this sentence refers to "introduction" to Europe or to a European sub-region or locality. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
135	23	4	16	4	16	If "unlikely" is being used as calibrated uncertainty language, reflecting a probabilistic basis for its assignment, it should be italicized. (Mach, Katharine, IPCC WGII TSU)
136	23	4	16	4	17	Climate change and sea level rise will damage European cultural heritage, effects of sea level rise not mentioned in section 23.5.4.\n\n (NETHERLANDS)
137	23	4	16	4	17	... Including buildings, local industries, landscapes, and iconic places such as Venice, effects on local industries not mentioned in section 23.5.4.\n\n (NETHERLANDS)

#	Ch	From Page	From Line	To Page	To Line	Comment
138	23	4	16	4	17	... Including buildings, local industries, landscapes, and iconic places such as Venice: Section 23.5.4 states that Venice previously was vulnerable to flooding, but that adaptation measures have now been taken and that the frequency of storm surges may decrease, so that now the climate change impact on Venice is estimated to be smaller, suggest to skip the reference to Venice from ExSum.\n\n(NETHERLANDS)
139	23	4	16	4	18	It is strange that in this summary of all impacts of sea rise the one on cultural heritage is selected. This sounds country specific to me. A number of significant impacts could be mentioned (threat on critical infrastructure, population and its migration, cities etc). (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
140	23	4	18	4	18	Reference to Table 23-5 not correct, should be Table 23-4?\n\n(NETHERLANDS)
141	23	4	21	4	22	CO2 fertilization may be affected by stomata closure. So we would say [low confidence]\n\n(NETHERLANDS)
142	23	4	25	4	25	It would be preferable to also present a summary term for agreement along with the summary term for evidence given here. (Mach, Katharine, IPCC WGII TSU)
143	23	4	25	4	29	As much as possible, it would be preferable to indicate how these projected risks vary with the level of climate change and with timeframe (near-term versus long-term). (Mach, Katharine, IPCC WGII TSU)
144	23	4	27	4	28	ExSum Ch.23: "but decrease cereal yields in Southern Europe", in Ch.23 p.18 line 30 speaks of yield loss in general, not only cereals\n\n(NETHERLANDS)
145	23	4	28	4	28	in table 23-4 climate change not only affect the spread of pest and disease in northern europe but in the whole europe\n\n(NETHERLANDS)
146	23	4	31	4	31	typo: "234.2" --> "23.4.2" (Cassardo, Claudio, University of Torino)
147	23	4	34	4	36	As much as possible, it would be preferable to indicate how these projected risks vary with the level of climate change and with timeframe (near-term versus long-term). (Mach, Katharine, IPCC WGII TSU)
148	23	4	36	4	36	since the subject of this paragraph concerns wine yards, We would add specific reference to Box 23-1 ("Implications of Climate Change Impacts for European Wine and Vineyards")\n\n(NETHERLANDS)
149	23	4	39	4	43	Make clear whether this sentence refers to whole of Europe or to specific regions only. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
150	23	4	42	4	43	This statement is not duly supported by the text in Chapter 23. Being water one of the main concerns in Europe, and given its nature as a limited, cross-sectoral, transboundary resource, a more comprehensive and integrated approach to the evaluation of effects of climate change on this resource and its management would be needed. Linking water resources solely to agriculture (page 21) seems quite insufficient. The integrated water management proposed does not derive from the information contained in the chapter. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
151	23	4	45	4	45	The use of "sea" here feels a bit odd to me. "Ocean" or "marine" may be preferable. (Mach, Katharine, IPCC WGII TSU)
152	23	4	45	4	51	This section seems inconsistent with section 23.4.6, and dwells on what will "not" occur, versus need to manage (UNITED STATES OF AMERICA)
153	23	4	46	4	46	Exec Sum: ch6 p 30 L 44 gives "medium evidence" that "temperature-mediated changes affect the body size of marine organisms". The confidence statements should be balanced and a confidence level given in both chapters. (Menzel, Lena, Alfred Wegener Institute for Polar and Marine Research)
154	23	4	46	4	47	It is not clear what is known (and what not) for regions other than the Bay of Biscay. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
155	23	4	46	4	47	This statement is perhaps not as clear as it could be, given that "not decrease" is cumbersome for the reader to understand. (Mach, Katharine, IPCC WGII TSU)

#	Ch	From Page	From Line	To Page	To Line	Comment
156	23	4	46	4	48	These seem to be very optimistic statements, based on limited literature. The statement on fishing fleets, derived from only 1 article, clashes with recognized impacts on fish resources in the same article. This estimated decrease in turnover in the article is estimated to be 6-17%: it is subjective stating that this is not a decrease. The article on fishing fleets in the Baltic concludes the opposite to what is stated here. Statement in pages 41 (lines 49-51) and 42 (37-41) could contradict these summary statements. The amount of impacts observed (nutrients, fish populations, migration) challenge this synthesis overview as well. For positive effects of climate change on fishing, see example in El Hierro island (Canthidermis suflamen, Decapterus macarellus) (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
157	23	4	48	4	48	??? but fishing fleets which target selected species may have to move with the species. This statement seems contradictory within this chapter and with chapter 6. e.g. ch 23 p25 L 25-26 "Fishing fleets which presently target marine species (e.g. cod, herring, sprat, plaice, sole) in the Baltic may have to relocate to more marine areas or switch to other species which tolerate decreasing salinities" (Menzel, Lena, Alfred Wegener Institute for Polar and Marine Research)
158	23	4	48	4	48	I question the general validity of this statement, even if restricted to Europe: "Climate Change will not entail relocation of fishing fleets (high confidence)". The same statement is repeated in other chapters, but not in 23.4.6, which is referred to. (Ottersen, Geir, Institute of Marine Research)
159	23	4	50	0	0	Please check identity of terms 'cyanobacterial blooms' as mentioned here, with 'algal blooms' as mentioned in the TS (p.40, I.5) (GERMANY)
160	23	4	50	4	50	ch6 p 46 L 36-37 sees low confidence "limited evidence and low confidence on how harmful algal blooms and the prevalence of pathogens will respond to climate change." (Menzel, Lena, Alfred Wegener Institute for Polar and Marine Research)
161	23	5	1	5	1	assuming future emissions reductions: Section 23.6.1 mentions "assuming no change in future emissions" (Ch.23 p.30 lines 9-10) (NETHERLANDS)
162	23	5	1	5	2	due to higher temperatures: Section 23.6.3 mentions more effects than only temperature, e.g. low flow/drought, nutrient releases caused by precipitation events. Suggest to change to "due to higher temperatures and changing precipitation patterns" (NETHERLANDS)
163	23	5	1	5	3	Please clarify how drought & flooding affect soil erosion & surface water quality in Section 23.4.3&23.6.3 (UNITED STATES OF AMERICA)
164	23	5	2	5	3	There are some evidences, discussed in section 23.6.2. This statement may erroneously suggest that there will be no effects (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
165	23	5	3	5	3	... Climate change on soil erosion, salinisation or soil fertility: effects on salinisation not mentioned in Section 23.6.2. (NETHERLANDS)
166	23	5	4	5	4	... Increased forest productivity in northern Europe: Section 23.6.2 only mentions potential productivity increase in northern Europe in the future, not observed productivity increase in Northern Europe in the past (NETHERLANDS)
167	23	5	5	0	0	The term "climate warming" is popular but not scientifically sound. Climate is defined as a medium-term average of meteorological conditions and as such can change but not warm, cool, improve or deteriorate. This is far more fundamental than just a semantic detail: the climate problem is not simply a temperature case but relates to the increasing energy content within the complex climate system (temperature is just one consequence and indicator of this). IPCC should be serious about the use of vague and potentially misleading terminologies. I therefore strongly recommend to replace the term "climate warming" by a precise and correct expression throughout all IPCC ARs. (Haeberli, Wilfried, University of Zurich)

#	Ch	From Page	From Line	To Page	To Line	Comment
168	23	5	5	5	8	This statement should be revised. As explained elsewhere, recent studies show a different pattern: non-significant trend in the number of fires since 1986 in Mediterranean Europe, and significant decrease in the last decade. Also a significant decrease in area burnt over the whole period. Jesús San-Miguel-Ayanz , Marcos Rodrigues , Sandra Santos de Oliveira, Claudia Kemper Pacheco , Francisco Moreira , Beatriz Duguy and Andrea Camia (2012). Land Cover Change and Fire Regime in the European Mediterranean Region. Chapter 2 in F. Moreira et al. (eds.), Post-Fire Management and Restoration of Southern European 21 Forests, Managing Forest Ecosystems 24, Elsevier. DOI 10.1007/978-94-007-2208-8_2 (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
169	23	5	6	5	10	As much as possible, it would be preferable to indicate how these projected risks vary with the level of climate change and with timeframe (near-term versus long-term). (Mach, Katharine, IPCC WGII TSU)
170	23	5	7	5	7	It may be helpful to refer the reader to the Introduction or to figure 23-1 for explanation of sub-regions. These have not been introduced yet at this point. (UNITED STATES OF AMERICA)
171	23	5	8	5	8	and from storms (low confidence): Section 23.4.4 mentions impacts of storms only in Central Europe (Ch.23 p.23 lines 18-25), change to "and from storms in Central Europe (low confidence)"? \n \n (NETHERLANDS)
172	23	5	9	0	10	a general trend of what? Please be more specific in describing this trend. (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
173	23	5	10	5	12	This sentence is very vague. Formulate more concretely. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
174	23	5	15	0	17	Meaning unclear. Please improve. (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
175	23	5	20	5	20	specify invasive species in which ecosystem (terrestrial, marine or freshwater ??) \n \n (NETHERLANDS)
176	23	5	21	0	22	'movement' of coastal wetlands could be better described as displacement (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
177	23	5	22	5	23	That conservation policies have not considered the impacts of climate change is blatantly incorrect, one only has to look the the EU biodiversity targets and some Member State policy documents e.g. UK (Berry, Pam, Oxford)
178	23	5	23	0	25	There is some conflict in what is written in this phrase. The Natura 2000 network covers the large majority of protected (for biodiversity) areas in Europe. So, it is not clear how biodiversity is affected in unprotected areas more than in protected ones, when the Natura 2000 sites fail to do so. It should be described which are these other protected areas that are not included in the Natura 2000 network and which conserve biodiversity more successfully under climate change. I suggest it be replaced by the following: "Biodiversity is affected in unprotected areas more than in protected ones; however, it is not still clear whether the Natura 2000 network can retain climate suitability for all groups of species more effectively than areas outside it." (the reasons for this are given below). (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
179	23	5	23	5	25	The fact that protected areas do not protect is a serious statement. EU member states struggle for years to pass legislation A great number of private properties are devalued because they are within NATURA zones. Is it appropriate to make this statement based on "low confidence"? (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)

#	Ch	From Page	From Line	To Page	To Line	Comment
180	23	5	23	5	25	This statement , out of the context of its article, is misleading and should be removed. Readers might not understand the difference between protected areas, Natura 2000 and unprotected areas (the 3 are different). Also, the analysis carried out in the article only considers climate suitability at 2 temporal moments, but the surface area covered by Natura 2000 and the high-range altitude factor (mentioned in the article) would in principle allow for migration and other adaptive responses from species to climate change. the fact that protected areas are placed mostly in mountain areas has the effect of isolating species and of condemning species isolated there to extinction if they are unable to migrate. Obviously, if you select areas randomly, you will get most probably a better representation of the full geography (and climate variability) than when you select with some criterion. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
181	23	5	23	5	25	Citation: "Biodiversity is affected in unprotected areas more than in protected areas, but Natura 2000 areas retain climate suitability for species no better and sometimes less effectively than unprotected areas." Comment: 1) This sentence is an incorrect citation of the summary of the original paper from Araujo 2011: whereas in the original paper the sentence is formulated as a statement about the future ("Protected areas ARE EXPECTED to retain climatic suitability for species better than unprotected areas, but Natura 2000 retain climate suitability for species no better and sometimes less effectively than unprotected areas.") because the paper deals with projections until 2080, the given sentence in the TS is a statement about the presence "Biodiversity IS AFFECTED...". 2) In the original paper of Araujo the analysis differentiates between three categories: protected areas, unprotected areas and Natura 2000. This is not explicitly mentioned in the TS nor chapter 23 and may lead to confusion. 3) One key finding is based on data of plants ("in fact, the Natura 2000 is less effective in retaining suitable climate for plant species than sets of randomly selected unprotected areas") but data of birds show different results ("For half of the remaining combinations of taxonomic groups and scenarios, the Natura 2000 provides no better buffer against climate change than areas outside the network, with the exception of birds"). 4) In Araujo's paper some explanations are given for differences in changes of climate suitability between protected areas and Natura 2000: "Differences in changes of climate suitability between protected areas and Natura 2000 are partly related with topography. Most protected areas are in mountains or rugged environments. The Natura 2000 also prioritizes farmlands and these are located in lower and flatter lands. Because proportional range losses arising from climate change are usually more pronounced in flatlands than in rugged terrains, the Natura 2000 is more vulnerable to climate change." Suggestion: Since the given sentence in the TS is a coarse reduction of findings and explanations of the original paper and may lead to misinterpretations, we propose to delete the sentence here and to replace it with the following original quotation from Araujo's paper: Protected areas are expected to retain climate suitability for species better than unprotected areas. (GERMANY)
182	23	5	27	5	43	The executive summary closes well and adaptation is a strong component of this chapter. (UNITED STATES OF AMERICA)
183	23	5	28	5	28	The phrase "for other world regions" is a bit ambiguous--capacity to adapt will be higher in Europe as compared to all other world regions or as compared to some other world regions? (Mach, Katharine, IPCC WGII TSU)
184	23	5	30	5	32	This sentence (and the underlying text) should include the findings of the EEA Report No 3/2013 "Adaptation in Europe" published in April 2013 and may include examples from the CIRCLE-2 "Adaptation Inspiration Book" published in March 2013. Both documents should be cited in the underlying text. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
185	23	5	33	5	34	In this and other parts of the chapter the message should be more positive in my view i.e. adaptation should definitely be part of planning as planning is the key to step forward in a proactive fashion. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)

#	Ch	From Page	From Line	To Page	To Line	Comment
186	23	5	36	5	37	I am not sure the logic behind this statement is correct. We are not interesting in merely the costs of adapting buildings. We also need to know what the savings are. If I spend 10.000 euros to adapt my apartment and gain the same amount of money within 10 years due to reduced energy consumption it then becomes a financing problem. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
187	23	5	37	5	37	did not find enough reference to justify "high confidence" within the cited par. 23.3.2. Please add more references or change the confidence level \n\n (NETHERLANDS)
188	23	5	39	3	40	This statement needs linkage to the limits of adaptation mentioned on page 3 line 29. (sections 23.5 and 23.8) (Wolf, Tanja, WHO Regional Office for Europe)
189	23	5	39	5	43	Would like to see mentioning of "maladaptation" risk here, because currently reads: There are potential synergies (of A+M), but also conflicts ("unintended consequences") of mitigation. But there also "unintend consequences" of adaptation (also in the built environment and energy). So just add "There are unintended consequences of mitigation policies and adaptation policies in the built environment ...". Examples are plenty! Unfortunately UFZ studies (MACIS, BASE, SynKon) not yet reviewed papers! (Schwarze, Reimund, Helmholtz Leipzig)
190	23	5	42	5	43	This statement for unintended consequences needs explaining. Providing complete meanings is part of good scientific writing. One example could be sufficient here. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
191	23	5	49	5	49	Remove "anthropogenic" unless there is a clear attribution of the observed climate impacts on the sectors to the anthropogenic contribution. (GERMANY)
192	23	6	1	0	2	It would be better if we knew right from the beginning which are the other island states of Europe that are discussed in the Small Island Chapter 29. For instance, where is Cyprus discussed? We are told that Malta is discussed there, but there is no information on this other European island state. (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
193	23	6	4	0	0	Southern, Northern (Kreienkamp, Frank, Climate & Environment Consulting Potsdam GmbH)
194	23	6	4	0	4	Please do not forget to separate the two words ' Southern Northern' with a comma (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
195	23	6	4	6	4	typo: "Southern Northern" --> "Southern, Northern" (Cassardo, Claudio, University of Torino)
196	23	6	16	6	17	Given the widespread usage of "climate sensitivity" as shorthand for "equilibrium climate sensitivity" in a specific physical science sense, I would recommend using "sensitivity to climate change" or another alternative to avoid confusion. Vulnerability is also relevant here and could be used as well. (Mastrandrea, Michael, IPCC WGII TSU)
197	23	6	17	6	17	It might be preferable to clarify that "climate sensitivity" does not mean "equilibrium climate sensitivity" here, instead referring to vulnerability and sensitivity (I assume). (Mach, Katharine, IPCC WGII TSU)
198	23	6	27	6	31	Is the statement, that most of the research is based on EU founding, true? In Germany also the Federal Ministry for Research .. and the Bundesländer spending a lot of money for climate impact research. I think the same is true for many other countries. (Kreienkamp, Frank, Climate & Environment Consulting Potsdam GmbH)
199	23	6	36	0	37	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
200	23	6	50	6	50	The correct name of the "EU Adaptation Platform is: European Climate Adaptation Platform (Climate-ADAPT). This name should be used here and throughout the chapter. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
201	23	6	51	0	0	To change '...is due in March 2013' to Reference on this publication (see comment above) (Trombitsky, Ilya, Eco-TIRAS International Environmental Association of River Keepers)

#	Ch	From Page	From Line	To Page	To Line	Comment
202	23	6	51	0	0	Update or provide a reference for "The EU adaptation strategy is due in March 2013" since the date has been passed. (Costas Balaras, Institute for Environmental Research and Sustainable Development, National Observatory of Athens, Greece) (GREECE)
203	23	6	51	0	0	The sentence could be rephrased to refer to the newly adopted EU Strategy on adaptation to climate change, available from: http://ec.europa.eu/clima/policies/adaptation/what/documentation_en.htm . European Commission, 2013: COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS. An EU Strategy on adaptation to climate change. COM(2013) 216 final. European Commission, Brussels. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
204	23	6	51	6	51	The European Commission adopted an EU strategy on adaptation on 16 April 2013 http://ec.europa.eu/clima/policies/adaptation/index_en.htm (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
205	23	6	52	6	52	EU Adaptation Strategy is out: EEA Report 3/2013, ISSN 1725-9177 (Schwarze, Reimund, Helmholtz Leipzig)
206	23	6	54	6	54	Statement of Ian Clark at GPDRR13: Focus of New EU Adaptation Strategy is Cross-Sectoral, Integration into Policies, Climate-Proofing. Also Data Sharing (EEA, CLIMATEADAPT). Currently: Only Voluntary Commitments of Member States to set up and implement NAS. But EU "keeps full legislative options" if MS do not act to implement and monitor efforts on adaptation. (Schwarze, Reimund, Helmholtz Leipzig)
207	23	7	10	0	0	which WG? AR4 12.4.1 (Kreienkamp, Frank, Climate & Environment Consulting Potsdam GmbH)
208	23	7	11	0	0	which WG? AR4 12.4 (Kreienkamp, Frank, Climate & Environment Consulting Potsdam GmbH)
209	23	7	12	7	13	Need a more recent reference than 2006 to support "Urbanisation is projected to increase all over Europe (Reginster and Rounsevell, 2006)". (Costas Balaras, Institute for Environmental Research and Sustainable Development, National Observatory of Athens, Greece) (GREECE)
210	23	7	21	7	21	Section 23.2 describes current and future climate trends, starting with a summary of non-climate trends. How is this term defined? In other words, what is considered non-climate? Do the areas addressed cover the range of non-climate trends? A short discussion would provide an improved context for the statements made (UNITED STATES OF AMERICA)
211	23	7	23	8	32	Section 23.2.1 Non-climate trends will be hard to project over the next 50 or 100 years—e.g., migration, land use, economic growth (stated as presently stalled), impacts on ecological properties of agro productivity, and others. Detailed socio-economic scenarios are mentioned only for Netherlands and UK and Scotland. Probabilistic socioeconomic futures are mentioned to have been developed for agro and land use changes at global scale and Europe, but also mentioned is a lack of evidence for the use of probabilistic evaluation or scenarios for decision making. Moreover, future trends in non-climatic parameters (sectors) can themselves be influenced by climate trends. That is, the two may not be linearly separable? The section is well written and available information concisely summarized. However, it is not quite clear if some of these (such) caveats are explicitly or adequately reflected in the final conclusions? (UNITED STATES OF AMERICA)
212	23	7	25	7	26	It is not clear whether the reference is to "social welfare" (how defined?) or "economic welfare", and for which period. Economic welfare did not increase across all of Europe since publication of the AR4. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
213	23	7	25	7	33	I am surprised to see population under "non-climate trends". Migration can definitely be caused by climate change. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
214	23	7	25	7	33	wordy paragraph, needs sharpening. I am used to having a "topic sentence" as a start of a paragraph; restructuring of some of the content of the chapter accordingly would help the reader (Wolf, Tanja, WHO Regional Office for Europe)
215	23	7	26	7	26	Obviously welfare has not been improving in all countries. Population has not been increasing everywhere either. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)

#	Ch	From Page	From Line	To Page	To Line	Comment
216	23	7	31	7	31	a reference seems missing after economic policy\n\n (NETHERLANDS)
217	23	7	33	7	33	Casual usage of "likely" should be avoided. (Mach, Katharine, IPCC WGII TSU)
218	23	7	35	7	35	Economic growth has become negative in some instances. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
219	23	7	41	0	0	Sentence is incomplete.(Constantinos Cartalis, Environmental Physics, University of Athens, Greece) (GREECE)
220	23	7	41	0	0	The sentence is not complete. (Costas Balaras, Institute for Environmental Research and Sustainable Development, National Observatory of Athens, Greece) (GREECE)
221	23	7	41	0	41	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
222	23	7	41	7	41	This is an overstatement. Agriculture is the most dominant land use in terms of coverage on the ground. One could say that dominant is what is most important in economic terms (not acreage). (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
223	23	7	41	7	41	Reference Easterling's paper on fibre here; it appears in the Bibliography. (UNITED STATES OF AMERICA)
224	23	7	41	7	41	typo: "use and. Europe" --> "use. Europe" (Cassardo, Claudio, University of Torino)
225	23	7	41	7	42	...Agriculture is the most dominant... Perhaps a reference is needed. (Dimitris Damigos, Mining and Metallurgical Engineering, NTUA, Greece) (GREECE)
226	23	7	41	7	53	Are the tends described here non-climatic as the heading suggests? (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
227	23	7	41	7	53	If possible, provide the % of European area occupied by agriculture (as reported for forested areas). (UNITED STATES OF AMERICA)
228	23	7	42	7	42	It may be clearest to specify which war is meant. (Mach, Katharine, IPCC WGII TSU)
229	23	7	49	7	49	Casual usage of "likely" should be avoided, as it is a reserved likelihood term. (Mach, Katharine, IPCC WGII TSU)
230	23	8	1	8	1	The trend is also very important. Some specific indication of deforestation/forestation? (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
231	23	8	1	8	6	the recent winter in Greece has shown that, when economy is recessing so deeply than a relevant part of the population is facing difficulties in finding the money for surviving, and thus is unable to use the standard heating systems, will use (and abuse) also wood from public forested areas. If economy in the current century will be not good for a remarkable portion of EU citizens, I am wondering whether this could cause a relevant anthropogenic threat for the forests. This is just a reflection, and I am not sure that already some papers have studied this case in detail, but I am curious to know if such kind of feedback has ever been studied. (Cassardo, Claudio, University of Torino)
232	23	8	4	8	4	If "very likely" is being used as calibrated uncertainty language, reflecting a probabilistic basis for its assignment, it should be italicized. Casual usage of the reserved likelihood term should be avoided. (Mach, Katharine, IPCC WGII TSU)
233	23	8	5	8	5	a reference seems missing after "forest growth"\n\n (NETHERLANDS)
234	23	8	6	8	6	The point is missed here. Will forest area by more or less in the future? (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)

#	Ch	From Page	From Line	To Page	To Line	Comment
235	23	8	8	8	10	This statement should be revised. As explained elsewhere, recent studies show a different pattern: non-significant trend in the number of fires since 1986 in Mediterranean Europe, and significant decrease in the last decade. Also a significant decrease in area burnt over the whole period. Jesús San-Miguel-Ayanz , Marcos Rodrigues , Sandra Santos de Oliveira, Claudia Kemper Pacheco , Francisco Moreira , Beatriz Duguy and Andrea Camia (2012). Land Cover Change and Fire Regime in the European Mediterranean Region. Chapter 2 in F. Moreira et al. (eds.), Post-Fire Management and Restoration of Southern European 21 Forests, Managing Forest Ecosystems 24, Elsevier. DOI 10.1007/978-94-007-2208-8_2 (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
236	23	8	12	0	0	Significant research has been made in terms of recognising urban sprawl patterns in Europe and estimating respective trends. Discussion on the issue should be provided. (Constantinos Cartalis, Environmental Physics, University of Athens, Greece) (GREECE)
237	23	8	12	8	12	The statement on urban sprawl levels needs explaining. Moderate compared to what and based on what evidence? (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
238	23	8	12	8	13	Urbanization would be projected to increase if economy has growing. But it is not. This statement is probably based on old data? (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
239	23	8	12	8	19	Socio-economic conditions have substantially changed in Europe since 2006, particularly in Northern Mediterranean countries. The trend towards increasing urbanisation has curbed, and counterurbanisation fluxes may increase in the near future. E.g., Kasimis, C. (2010). Socio-demographic imbalances in rural Europe and international mobility to rural areas: the case of Greece. Sociological Review 2: 57-75. (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
240	23	8	12	8	19	If possible, provide the % of European area occupied by urban class (as reported for forested areas). (UNITED STATES OF AMERICA)
241	23	8	12	8	19	another reflection here. "Europe has relatively moderate urban sprawl": this is because the population in general and the urban population in particular, is stable or even slightly declining somewhere. Despite this fact, the "moderate urban sprawl" is a systematic process that is continuing to convert the best "primary" soil types (for agricultural purposes) in space for buildings or industrial plants, or anyway in non-agricultural or forestal use. (Cassardo, Claudio, University of Torino)
242	23	8	13	0	0	Interesting information on Housing is provided in Synnefa A., A. Dandou, M. Santamouris and M. Tombrou, 2007: On the use of cool materials as a heat island mitigation strategy, Journal of Applied Meteorology and Climatology, 47, 2846-2856. (Constantinos Cartalis, Environmental Physics, University of Athens, Greece) (GREECE)
243	23	8	15	8	15	Casual usage of "likely" should be avoided, as it is a reserved likelihood term. (Mach, Katharine, IPCC WGII TSU)
244	23	8	15	8	16	Why periurbanization is a recent trend? Was it not one of the fundamental trends always? (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
245	23	8	16	8	16	In some countries residences go to periurban areas for their rural character. In other countries they go mostly for their coastal character. Rural is country specific. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
246	23	8	18	7	19	other environmental trends are not the topic of this paragraph on urban sprawl. Move elsewhere. (Wolf, Tanja, WHO Regional Office for Europe)
247	23	8	18	8	18	The term 'outdoor' is probably not needed here (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
248	23	8	19	8	19	contradiction in trends - specify location\n\n (NETHERLANDS)
249	23	8	21	8	32	not clear to me what the message of this paragraph is. Is it about methods to assess future impacts? Could be made clearer but would better fit into 23.2.2 as "many of these scenario studies also account for future climate change". (Wolf, Tanja, WHO Regional Office for Europe)

#	Ch	From Page	From Line	To Page	To Line	Comment
250	23	8	23	0	0	Spangenberg et al. 2011 does not seem to be on biodiversity. (Parker, David, Met Office Hadley Centre)
251	23	8	29	8	32	I don't see any European specific study (not global) based on European datasets (CORINE, Urban Atlas, Urban Audit). If this is the case is this not alerting for the availability of datasets in Europe or their quality? Any recommendations in the text? How are we going to assess policy if we lack the data? (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
252	23	8	31	0	0	Bryson et al. 2010 reference missing. (Parker, David, Met Office Hadley Centre)
253	23	8	35	11	15	The word inconsistent is used in several instances in 23.2.2. It does not appear to be the correct word for what the authors are trying to say. (UNITED STATES OF AMERICA)
254	23	8	35	11	15	Section 23.2.2: This section has to be updated to ensure consistency and cross-referencing with relevant WGI AR5 chapters and the Annex I: Atlas of global and regional climate projections, as well as SREX Chapter 3. Currently, there is not a single reference to the WGI in section 23.2.2.1 (Obs). Please provide more thorough, consistent and precise cross-references to SREX and WGI AR5 in section 23.2.2.2. and 23.2.2.3. (Plattner, Gian-Kasper, IPCC WGI TSU)
255	23	8	39	9	7	The climate has already been changed in Greece in the past 50 years and there has been a very short tipping point around the year 1988. Temperatures have increased, especially the low temperatures together with the variability in precipitation. We have observed decreases in flow both in Crete (ie Koiliaris River Basin) and peloponnisos (Evrotas River Basin). Below there is a list of references on the subject. Since these climate change impacts in Greece have been documented, it will be interesting to be analyzed in order to ground truth future impacts. 1. Nikolaidis, N.P., F. Bouraoui. and G. Bidoglio, 2013. Hydrologic and geochemical modeling of a karstic Mediterranean watershed, Journal of Hydrology, 477, 129-138. 2. Koutroulis A. G., Tsanis I.K. and D. Jacob, "Impact of climate change on water resources status: a case study for Crete Island", Greece Journal of Hydrology, 479,146-158, 2013. 3. Vrochidou A., Tsanis I.K., "The impact of climate change on hydro-meteorological droughts at a basin scale", Journal of Hydrology, 476, 290-301, 2013. 4. Koutroulis A. G., Grillakis., Tsanis I.K., V. Kotroni and K. Lagouvardos, "Lightning activity, rainfall and flash flooding. Occasional or interrelated events? A case study in the island of Crete, Natural Hazards and Earth System Sciences, 12(4), 881-891, 2012. 5. Vrochidou A., Tsanis I.K., "Assessing precipitation distribution impacts on droughts on the island of Crete", Natural Hazards and Earth System Sciences, 12, 1159-1171, 2012. 6. Tsanis, I.K., Koutroulis A.G., Daliakopoulos, I.N. and Jacob, D., "Severe Climate?Induced Water Shortage and Extremes in Crete", Climatic Change, 106, 4, 667-677, June 2011. 7. Koutroulis A.G., Vrochidou A., Tsanis I.K., "Spatial and temporal characteristics of droughts for the island of Crete", Journal of Hydrometeorology, 12, 2 206-226, 2011. 8. Koutroulis, A.G., Tsanis I.K., Daliakopoulos, I.N., "Seasonality of floods and their hydro-meteorological characteristics in the island of Crete", Journal of Hydrology, Special issue on Flash Floods, 394, Issues 1-2, 90-100, 2010. 9. Gamvroudis C., N.P. Nikolaidis, O. Tzoraki, V. Papadoulakis and N. Karalemas, 2013. Sediment Transport Modeling of a Large Ephemeral River basin, J. of Hydrology (In Review). 10. Tzoraki, O, Cooper, D., Kjeldsen, Th., Nikolaidis, N. P., Gamvroudis, Ch. Froebrich, J. Querner, E., Gallart, F. and Karalemas, N. 2013. Flood Generation and Classification of a semi-arid Intermittent Flow Watershed: Evrotas river, International Journal of River Basin Management, 11:1, 77-92. (Nikolaos Nikolaidis, Environmental Engineering, Technical University of Crete, Greece) (GREECE)
256	23	8	41	0	0	Haylock et al. 2008 do not present trends; it is true that annual trends have been greater in northern than southern Europe (WGI Chapter 2 Figure 2.22) (Parker, David, Met Office Hadley Centre)
257	23	8	42	8	42	is there any additional reference (journal) to EEA 2012 (NETHERLANDS)
258	23	8	47	0	0	the closing) is missing (Kreienkamp, Frank, Climate & Environment Consulting Potsdam GmbH)
259	23	8	47	8	50	For these examples and trends, it would be helpful to specify the relevant time frame. (Mach, Katharine, IPCC WGII TSU)

#	Ch	From Page	From Line	To Page	To Line	Comment
260	23	8	47	8	53	In terms of cities and people temperature alone does not provide a complete picture. It is thermal comfort that is important (temperature + humidity + wind). 40 degrees are tolerable with a light breeze and low humidity whereas 30 degrees are intolerable with 0 wind and high humidity. The same problem appears in other occasions in the text. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
261	23	8	48	8	48	Galli et al. (2010) founded that "The results show that, in general, the number of cold breaks is decreasing over the Alps, due to the temperature increment. However, there are certain zones where the behaviour is more complicated". Ref.: Water 2010, 2, 363-380; doi:10.3390/w2030363. Galli, S. M. Oh, C Cassardo, S. K. Park (2010) The Occurrence of Cold Spells in the Alps Related to Climate. Water (2010), 2, 363-380; doi:10.3390/w2030363 (Cassardo, Claudio, University of Torino)
262	23	8	48	8	49	The reference "EEA, 2011" should be replaced by "EEA, 2012". (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
263	23	8	49	8	50	even if it is still not fully understood, what is with the possible link between the ice cover changes and the cold winter. Jaiser et al (2012): Impact of sea ice cover changes on the Northern Hemisphere atmospheric winter circulation. Tellus A 2012, 64, 11595, DOI: 10.3402/tellusa.v64i0.11595. Please add at least a cite. (Kreienkamp, Frank, Climate & Environment Consulting Potsdam GmbH)
264	23	8	52	8	53	There is a terrific figure to illustrate this very point in the Barriopedro et al. (2011) Science paper (Figure 3) that would be a superb and striking addition to this chapter and possibly even the SPM (unless it has already been used in WG I). (Carter, Timothy, Finnish Environment Institute)
265	23	8	53	0	0	I propose to add: A second record hot summer that affected most of southern and southeastern Europe was observed in 2007 (Busuioc et al, 2007; Corobov et al., 2010; Founda & Giannakopoulos, 2009). Accordingly, to add in References: Busuioc A, Dumitrescu A, Soare E, Orzan A (2007) Summer anomalies in 2007 in the context of extremely hot and dry summers in Romania. Roman J Meteorol, 9:1-17. Corobov R., S. Sheridan, A. Overcenko, N. Terinte, 2010: Air temperature trends and extremes in Chisinau (Moldova) as evidences of climate change. Climate Research 42:247-256. (Trombitsky, Ilya, Eco-TIRAS International Environmental Association of River Keepers)
266	23	9	1	9	2	This is one of the examples in which the reference to "EEA, 2008" (more correctly: "EEA-JRC-WHO, 2008") should be replaced by "EEA, 2012" (see comment above). (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
267	23	9	3	9	3	high variability: interannual, or spatial? (Cassardo, Claudio, University of Torino)
268	23	9	4	0	5	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
269	23	9	5	9	5	Max or average windspeeds? This could be important to assess the impact on windmill energy production capacity. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
270	23	9	5	9	5	typo: remove "(" (Cassardo, Claudio, University of Torino)
271	23	9	5	9	7	Could also cite paper by P. Bett et al. (2013) Adv. Sci. Res., 10, 51-58, who analysed the Twentieth Century Reanalysis data and found no trend in wind speeds over Europe. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
272	23	9	7	9	7	problematic anemometer data: why "problematic"? What means? It is a general consideration on all anemometer data, or only in the case of Europe (and in this case, why?)? (Cassardo, Claudio, University of Torino)
273	23	9	9	9	9	increasing by how much? Quantitative information is missing. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
274	23	9	10	9	10	decreases --> decreased (Cassardo, Claudio, University of Torino)

#	Ch	From Page	From Line	To Page	To Line	Comment
275	23	9	10	9	11	this point is clear; however, it could be interesting to give the estimate of the "real" sea level rise by "detrending" the sea level with the vertical crustal motion... (Cassardo, Claudio, University of Torino)
276	23	9	11	9	13	This statement is correct only for some (northern) regions of the Baltic coast, *not* for the whole Baltic. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
277	23	9	13	9	13	Mention here as well the importance of Early Warning Systems in the Disaster Reduction Cycle as accordin to UN-ISDR guidelines (Ciavola, Paolo, University of Ferrara)
278	23	9	13	9	13	already on p 5 line 49 I got stuck with the term "anthropogenic" climate change. I think it's not of added value to highlight this attribute. Probably a big part of climate change is man-made and we all know this, why wasting words on this? For the impacts it doesn't matter and this attribute just gives skeptists an avoidable entry point. (Wolf, Tanja, WHO Regional Office for Europe)
279	23	9	17	10	2	I am transferring a comment from the FOD that was completely ignored by Chapter 2 (methods) and I think might merit some attention here, as the work was first demonstrated during the ENSEMBLES project. Here's the comment - a couple of the references are already in this chapter, but others could be added for appropriate sectors. I mention it here because the probabilistic climate component could be addressed here and really doesn't have to be RCP-based! Some of the figures produced may also be of interest (e.g. see Figs 3 and 5 in Fronzek et al. 2011). *** A number of authors have recently tried to extend methods of applying probabilistic climate information into various sectoral impact studies in a series of papers out of the EU ENSEMBLES project: Børgesen, C.D. and J.E. Olesen, 2011: A probabilistic assessment of climate change impacts on yield and nitrogen leaching from winter wheat in Denmark. Natural Hazards and Earth System Science, 11, 2541-2553. doi:10.5194/nhess-11-2541-2011; Ferrise, R., M. Moriondo and M. Bindi, 2011: Probabilistic assessments of climate change impacts on durum wheat in the Mediterranean region. Natural Hazards and Earth System Science, 11, 1293-1302. doi:10.5194/nhess-11-1293-2011; Wetterhall, F., L.P. Graham, J. Andréasson, J. Rosberg and W. Yang, 2011: Using ensemble climate projections to assess probabilistic hydrological change in the Nordic region. Natural Hazards and Earth System Science, 11, 2295-2306. doi:10.5194/nhess-11-2295-2011; Weiß, M., 2011: Future water availability in selected European catchments: a probabilistic assessment of seasonal flows under the IPCC A1B emission scenario using response surfaces. Natural Hazards and Earth System Science, 11, 2163-2171. doi:10.5194/nhess-11-2163-2011. The methods presented are similar to those advocated by Roger Jones over a decade ago, but now with rather more robust climate projections than were available to Roger (at least, more comprehensive in their analysis of all available evidence). All papers use the probabilistic climate projections developed for Europe by Harris, G.R., M. Collins, D.M.H. Sexton, J.M. Murphy and B.B.B. Booth, 2010: Probabilistic projections for 21st century European climate. Natural Hazards and Earth System Science, 10, 2009-2020. doi:10.5194/nhess-10-2009-2010. A further paper also attempts to combine probabilistic climate projections with estimates of impact model uncertainties: Fronzek, S., T.R. Carter and M. Luoto, 2011: Evaluating sources of uncertainty in modelling the impact of probabilistic climate change on sub-arctic palsa mires. Natural Hazards and Earth System Science, 11, 2981-2995. doi:10.5194/nhess-11-2981-2011, which is a follow-up paper to an earlier exploration of applying probabilistic climate information from a different (non-ENSEMBLES) source: Fronzek, S. and T.R. Carter, 2007: Assessing uncertainties in climate change impacts on resource potential for Europe based on projections from RCMs and GCMs. Climatic Change, 81 (Suppl. 1), 357–371. One motivation for addressing impact model uncertainties is the poor representation of uncertainty analysis in model-based studies, where uncertainties in projections are commonly a function of climate uncertainties alone, when in fact there are strong arguments for employing equivalent rigour to model testing and analysis for impact models (e.g. by exploring structural and parameter uncertainties through multi-model ensembles and uncertainty analysis) as has become the norm for climate models. An example of this reasoning for crop models is found in: Rötter, R.P., Carter, T.R., Olesen, J.E. and Porter, J.R. 2011. Crop–climate models need an overhaul. Nature Climate Change 1: 175-177. (Carter, Timothy, Finnish Environment Institute)

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280	23	9	17	11	15	The authors should make a concerted effort to revisit the literature and update projections based on published results from CMIP5. In its current state, much of the text relies on older model runs. If new results are not available, the authors should clearly state that these findings are from the CMIP3 model runs. (UNITED STATES OF AMERICA)
281	23	9	24	9	24	While Europe is fortunate to have climate data it is unfortunate because it does not have good quality land use data to measure the impact. Anyone who has worked with Urban Atlas, Urban Audit and CORINE can justify this. A mention in the text could be made to identify the problem and identify the construction of reliable land use time series datasets as a significant component of adaptation. As it is now the text makes no mention of the problem and the discussion is done as if we had the right datasets. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
282	23	9	28	9	28	Would it be clearer to say "average global temperature increase" instead of "climate warming"? (Mach, Katharine, IPCC WGII TSU)
283	23	9	29	9	30	the year for the cite van der Linden... is missing (Kreienkamp, Frank, Climate & Environment Consulting Potsdam GmbH)
284	23	9	30	9	30	year of publication? (Matthies, Eva Franziska, Consultant)
285	23	9	30	9	32	A visual spatial representation of the distribution of warming and cooling over Europe would be helpful to illustrate the statement. (UNITED STATES OF AMERICA)
286	23	9	32	0	0	Schmidli et al. 2007 deal with precipitation, not temperature. (Parker, David, Met Office Hadley Centre)
287	23	9	34	0	36	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
288	23	9	35	9	35	change "zone in between has less clear sign of change" with "zone in which the sign of change is less clear" (Cassardo, Claudio, University of Torino)
289	23	9	36	9	38	Please clarify timing. Is this change projected for the next decades or at the end of the 21st century? (GERMANY)
290	23	9	36	9	38	The text refers to the increase in winter precipitation with more rain than snow and a decrease of long term mean snow pack. Make the link to the implications of such changes (for water availability in the Spring which relies on melting of the snow pack). (UNITED STATES OF AMERICA)
291	23	9	37	9	38	the three phenomena indicated in this sentence occur all in Southern Sweden? In this case, it may be better to translate "up to Southern Sweden" at the end of the sentence. (Cassardo, Claudio, University of Torino)
292	23	9	38	9	39	This sentence seems not correct as Kunz et al. (2009) found that both hail damage days and convective instability increased during 1974-2003 in a state in southwest Germany and Mohr and Kunz (2012) found that convective parameters relevant for hail events exhibit a significant positive trend towards a higher convective potential in Germany and Europe. References: Kunz, M., J. Sander, and C. Kottmeier, 2009: Recent trends of thunderstorm and hailstorm frequency and their relation to atmospheric characteristics in southwest Germany. International Journal of Climatology, 29(15), 2283-2297. S. Mohr, M. Kunz, Recent trends and variabilities of convective parameters relevant for hail events in Germany and Europe, Atmospheric Research, Volume 123, 1 April 2013, Pages 211-228, ISSN 0169-8095, 10.1016/j.atmosres.2012.05.016. (Ferrone, Andrew, Public Research Centre - Gabriel Lippmann)
293	23	9	39	9	40	Changes in circulation patterns are inconsistent, except in northern Europe. Please describe this non-inconsistent change briefly. (Räisänen, Jouni, University of Helsinki)

#	Ch	From Page	From Line	To Page	To Line	Comment
294	23	9	39	9	41	are you talking about circulation pattern or about storm tracks (Ulbrich et al)? Please differentiate. What about blocking? In the context of please vote me : Kreienkamp et al (2010): Stationarity of atmospheric waves and blocking over Europe—based on a reanalysis dataset and two climate scenarios. Theor Appl Climatol. DOI 10.1007/s00704-010-0261-3 ; for the problem of the connection between circulations patterns and impacts please look at Spekat et al (2010): An impact-oriented classification method for atmospheric patterns. Physics and Chemistry of the Earth 35 (2010) 352–359. doi:10.1016/j.pce.2010.03.042 (Kreienkamp, Frank, Climate & Environment Consulting Potsdam GmbH)
295	23	9	40	0	0	Beck et al. 2007 analysed past, not future, climate. They showed that regional climate is affected by changes of both frequency and characteristics of large-scale circulation types. (Parker, David, Met Office Hadley Centre)
296	23	9	44	0	47	It would be better if there was information on the direction (and intensity) of changes. (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
297	23	9	44	9	45	It is not clear whether the term "better" refers to a comparison with other regions or with earlier assessments. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
298	23	9	44	9	45	add a reference to statement\n\n (NETHERLANDS)
299	23	9	46	9	47	Are any of these changes expected in the Mediterranean as well? (Ciavola, Paolo, University of Ferrara)
300	23	9	49	9	49	typo: compred --> compared (Cassardo, Claudio, University of Torino)
301	23	9	49	9	50	Can the second digit be used? Please reduce the digits to 1 like from 0,29 to 0,55 towards 0,3 to 0,6 (Kreienkamp, Frank, Climate & Environment Consulting Potsdam GmbH)
302	23	9	50	9	51	These projections are general to WG1 Chapter 7 and not cited specifically in 13.7 which is about extremes of sea levels and waves. (Parker, David, Met Office Hadley Centre)
303	23	9	51	9	52	Please give more information about the low confidence in projected regional changes. If not: is it useful to have a chapter 23 at all? All findings in this chapter are based on those low confidence. (Kreienkamp, Frank, Climate & Environment Consulting Potsdam GmbH)
304	23	9	52	10	2	A similar estimate has been made for the UK under the Thames Estuary 2100 project. See Ch.7 of the UKCP09 report "Marine and Coastal projections", available at: http://ukclimateprojections.defra.gov.uk/22544 (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
305	23	10	0	5	0	Table 23-1, A: It is not clear why some parameters (e.g., T) are estimated using 9 regional model simulations while other parameters (e.g., P) are estimated from 20 regional model simulations--taken from EU-ENSEMBLES project for SRES A1B scenario. (UNITED STATES OF AMERICA)
306	23	10	0	5	0	Table 23-1, B: Likewise, not clear why some parameters (e.g., T) are estimated using 7 regional model simulations while others (e.g., P) are estimated using 8 regional model simulations—taken from EURO-CORDEX project for the RCP 4.5 emissions scenario. (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
307	23	10	0	5	0	Table 23-1: There are significant differences, as expected, between parameter values in Table 23-1A compared to Table 23-1B. Expected because Table 23-1A refers to SRES A1B scenarios (AR4 models) and Table 23-1B refers to RCP 4.5 scenarios (AR5 models). The purpose of this Table or the manner in which it is presented is not quite clear. In Ch-1, Fig 1.5 (Pg. 36), the radiative forcing (RF) and T-Change for A1B are both substantially higher/larger than RCP 4.5 in, for example, year 2100. The SRES scenario most comparable to RCP4.5 appears to be SRES-B1 and not SRES-A1B. Likewise the RCP scenario comparable to SRES A1B is one that could probably be approximated by RCP 6.5 (not shown). It could be useful to show Table 23-1 parameters for comparable AR4/SRES and AR5/RCP to illustrate possible difference or improvements in AR5 over AR4. The opening paragraph in Section 23.2.2.3 (Pg. 10, Lines 7-10) does not explain the reason for Table-23-1, A and B---i.e., the reason for this particular mix of SRES/AR4 and RCP/AR5 scenarios and/or why AR4 and AR5 model results are treated in a seamless, interchangeable manner? An external reader, possibly uninformed of internal IPCC procedures, would expect more results with improved precision in AR5. And, if both AR4 and AR5 results are presented together, one could expect a comparison for the same boundary conditions (e.g., scenarios) to illustrate change from previous understanding, if any. There could be a logical and simple explanation which presently eludes the casual reader. (UNITED STATES OF AMERICA)
308	23	10	1	10	1	between 0.55 and 1.15 m and "by 0.40 to 1.05": these number refer to which emission scenario? (Cassardo, Claudio, University of Torino)
309	23	10	1	10	2	Where the text reports that sea level rise could rise globally between 0.55 and 1.15m, is that spread the result of different emission scenarios or the spread of results from different models, or both combined? Please clarify. (UNITED STATES OF AMERICA)
310	23	10	5	11	15	This section could benefit from a more direct definition of climate extremes variables, such as the one provided by the recommendations by the Climate Variability and Predictability (CLIVAR) Expert Team on Climate Change Detection and Indices. There is a good example of this in table 1 of the following reference: Duliere, V, Y Zhang, E.P. Salathe, Extreme Precipitation and Temperature over the U.S. Pacific Northwest: A Comparison between Observations, Reanalysis Data, and Regional Models. Journal of Climate, 24, 1950-1964. DOI: 10.1175/2010JCLI3224.1 (UNITED STATES OF AMERICA)
311	23	10	10	35	43	Figure 23-2: Also see (Legend for Fig. 23-2 A & B on Pg. 92, 93: Projected changes in number of heat waves): Some explanation would be useful to clarify why SRES/AR4 is being compared to or presented as an equal example as RCP4.5/AR5? More explanation is perhaps warranted in presenting and drawing conclusions from a mix of results from AR4 (SRES-A1B, and regional EU-ENSEMBLES) and AR5 (RCP-4.5, and regional EURO-CORDEX. Despite stated statistical significance, to the lay reader 66% of the models agreeing in the sign of change also means that 36% of the models did not agree even in the sign of the change, aside from scalar magnitude. And, this, for a temperature related parameter—temperature generally being considerably more spatially homogeneous than for example precipitation and derivatives such as surface water balance that is connected to soil moisture, runoff, evapotranspiration. Perhaps more explanation as to why 66% is to be considered a high number would be useful? Differences between Fig 23.2-A and Fig. 23.2-B are quite dramatic—perhaps explained by the choice of scenarios used (RCP-4.5 and SRES-A1B). They both refer to changes between mean (2071-2100) and mean (1971-2000). Not so obvious is why the changes shown in Fig. 23.2-A in northern Alpine regions (Norway) have disappeared in Fig. 23.2-B? (UNITED STATES OF AMERICA)
312	23	10	14	1	14	Table 23.1 Indicate what RCP correspond to scenario A1B. Where are the footnotes (1) (2), etc..? (Pecheux, Martin, Institut des Foraminifères Symbiotiques)
313	23	10	16	10	17	The likely range ... median: please do not repeat twice this sentence (Cassardo, Claudio, University of Torino)

#	Ch	From Page	From Line	To Page	To Line	Comment
314	23	10	21	10	27	Paper by Clark, R. T., et al. (2010), Do global warming targets limit heatwave risk? Geophys. Res. Lett., 37, L17703, doi:10.1029/2010GL043898 shows that for a warming of 2.0 +/- 0.5 deg.C can still get large variation in projected changes in heat waves and hot days. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
315	23	10	21	10	27	Discussion of the results shown in Figure 23-2 is far too brief. Why are the heatwave projections so different? Are the CO2 levels in these two scenarios very different?. How do the results compare with earlier studies, e.g., Meehl/Tebaldi, Science, 2004? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
316	23	10	21	10	27	The text is too abbreviated to provide a full explanation even if it attempts to connect with the heat waves for 2003 and 2006/2007. Perhaps more explanation would clarify the conclusions as implied? (UNITED STATES OF AMERICA)
317	23	10	23	10	25	For the described large differences, how much of the difference is due to the emissions scenario versus the modeling group/project? (Mach, Katharine, IPCC WGII TSU)
318	23	10	24	10	24	add "(MJJAS)" after season (Cassardo, Claudio, University of Torino)
319	23	10	25	10	27	It would be beneficial to include attribution studies on the Russian heat wave of 2010. (e.g. Dole et al; Rahmtorf and Coumou; Otto et al. 2012 is a good example:\nOtto, F. E. L., N. Massey, G. J. van Oldenborgh, R. G. Jones, and M. R. Allen (2012), Reconciling two approaches to attribution of the 2010 Russian heat wave, Geophys. Res. Lett., 39, L04702, doi:10.1029/2011GL050422. (UNITED STATES OF AMERICA)
320	23	10	25	10	27	Beniston (2009) has quantified the result. And the reader of this report could have an idea of this result without reading the Beniston's paper? (Cassardo, Claudio, University of Torino)
321	23	10	27	0	0	replace beniston 2009 citation by Beniston, M. (2007), Entering into the "greenhouse century": Recent record temperatures in Switzerland are comparable to the upper temperature quantiles in a greenhouse climate, Geophys. Res. Lett., 34, L16710, doi:10.1029/2007GL030144. (Parker, David, Met Office Hadley Centre)
322	23	10	29	10	32	The text states that projected changes in Fig. 23-3 are inconsistent in Southern Europe (all seasons). Looking at Fig. 23-3, it not clear as to what this means or how this conclusion is obtained? (UNITED STATES OF AMERICA)
323	23	10	31	10	32	Figure 23-3 mixes information from different scenarios (SRES and RCP) and a different set of climate models (Ensembles and Cordex). Please discuss the influence of both of these changes on the results. (Ferrone, Andrew, Public Research Centre - Gabriel Lippmann)
324	23	10	45	0	53	Figure 23-2: See also (Legend for Fig. 23-3 A & B on Pg. 94, 95: Projected seasonal changes of heavy precipitation): Comments: Eastern part? Eastern is not a classified region as per Fig. 23-1, and thus it is not clear from Fig. 23-3 as to what regions lack regional climate model projections. As regards 66%, see comment SC-5 but note that precipitation is a variable that has a larger uncertainty than temperature. The changes, as presented, are derived from 20 regional model simulations (A1B) from EU-ENSEMBLES, and from 7 regional model simulations (RCP4.5) from EURO-CORDEX. How does one compare the resulting change from such differences in the set of models used? Does the analysis assume that model numbers and differences do not matter? Moreover, for heat waves 9 and 7 regional models are used for the same set of scenarios. The question arises as to whether the heat wave analysis (temperature related) is "internally" consistent with the precipitation analysis given that a different set of (and numbers of) regional models are used. Perhaps there is a simple explanation that needs to be added to the text somewhere? (UNITED STATES OF AMERICA)

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325	23	10	46	10	53	For a review on sub-daily rainfall extremes, see Willems et al. (2013): • Willems, P., Olsson, J., Arnbjerg-Nielsen, K., Beecham, S., Pathirana, A., Bülow Gregersen, I., Madsen, H., Nguyen, V-T-V. (2012), 'Impacts of climate change on rainfall extremes and urban drainage', IWA Publishing, 252p., Paperback Print ISBN 9781780401256; Ebook ISBN 9781780401263 and : • Arnbjerg-Nielsen, K., Willems, P., Olsson, J., Beecham, S., Pathirana, A., Bülow Gregersen, I., Madsen, H., Nguyen, V-T-V. (2012). 'Impacts of climate change on rainfall extremes and urban drainage systems: a review', Water Science and Technology, doi: 10.2166/wst.2013.251 (Willems, Patrick KIJ Leuven)
326	23	11	0	0	0	Next to the observed and projected trends on river flows (Section 23.2.3) it is worth mentioning the impacts on pluvial floods (e.g. sewer floods in cities) given this becomes an important problem for the future. See review by Willems et al. (2012): • Willems, P., Olsson, J., Arnbjerg-Nielsen, K., Beecham, S., Pathirana, A., Bülow Gregersen, I., Madsen, H., Nguyen, V-T-V. (2012), 'Impacts of climate change on rainfall extremes and urban drainage', IWA Publishing, 252p., Paperback Print ISBN 9781780401256; Ebook ISBN 9781780401263 (Willems Patrick KIJ Leuven)
327	23	11	1	11	7	Define "small" in small tendency toward increased extreme. Also, this full paragraph may benefit from some re-writing as it is hard to take away a message from it. (UNITED STATES OF AMERICA)
328	23	11	8	11	8	What is an extreme sea level event? Storm surge on top of an el nino event? (UNITED STATES OF AMERICA)
329	23	11	10	11	10	the quantification of extreme sea level events (in meters) would be useful (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
330	23	11	12	0	0	British Isles' should be replaced by either 'UK' or 'Britain' (Donnelly, Alison, Trinity College Dublin)
331	23	11	13	0	15	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
332	23	11	16	11	16	Would it be possible to add a reference on the (potential) plausibility of increase in extreme events due to energy fluxes (latent heat, water vapour)? (Wolf, Tanja, WHO Regional Office for Europe)
333	23	11	18	12	15	Again astonishing: the strong effect of vanishing glaciers on streamflow and seasonal water supply seems to be missing. Huss (2011) and Haeberli et al. (2013) provide important overview information and up-to-date references: Huss, M. (2011): Present and future contribution of glacier storage change to runoff from macroscale drainage basins in Europe. Water Resources Research 47 W07511, doi:10.1029/2010WR010299. Haeberli, W., Paul, F. and Zemp, M (2013): Vanishing glaciers in the European Alps. Fate of Mountain Glaciers in the Anthropocene; Pontifical Academy of Sciences, Scripta Varia 118, 2013 www.pas.va/content/dam/accademia/pdf/sv118/sv118-haeberli-paul-zemp.pdf (Haeberli, Wilfried, University of Zurich)
334	23	11	18	12	15	Please provide more thorough, consistent and precise cross-references to WGI AR5 and SREX (Plattner, Gian-Kasper, IPCC WGI TSU)
335	23	11	20	0	0	Section 23.2.3 is poorly organised. Ideally, there should be identifiable paragraphs for both observed and projected changes. Droughts may deserve a subsection on their own as they cover not only hydrological droughts, but are also closely linked with meteorological and agricultural (edaphic) droughts. The current version of the paragraph makes it all confusing (Vidal, Jean-Philippe, Irstea)
336	23	11	20	11	21	Add increased temperature instead of or in addition to melting glaciers. The increased temperature affects evapotranspiration, snow accumulation and snow melt and the glaciers. (Hisdal, Hege, Norwegian Water Resources and Energy Directorate)

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337	23	11	20	11	34	The period when observed trends have been recorded should always be specified, as upward and downward trends may be observed over different periods, as shown by Giuntoli et al. (2013) in France and Hannaford et al. (2013) over different European regions, because of decadal oscillations in some climate characteristics. The list of detected trends in this paragraph must therefore be accompanied by the corresponding studied period in order to avoid potentially large misinterpretations. - Giuntoli, I., Renard, B., Vidal, J.-P., and Bard, A. (2013) Low flows in France and their relationship to large-scale climate indices. Journal of Hydrology, 482, 105-118. doi: 10.1016/j.jhydrol.2012.12.038 - Hannaford, J., Buys, G., Stahl, K., and Tallaksen, L. M. (2013) The influence of decadal-scale variability on trends in long European streamflow records. Hydrology and Earth System Sciences Discussions, 10, 1859-1896. doi:10.5194/hessd-10-1859-2013 (Vidal, Jean-Philippe, Irstea)
338	23	11	22	11	23	Explain why the large uncertainties in establishing flood trends in Europe. Is this due to the lack of standardized methods? How can it be improved? (UNITED STATES OF AMERICA)
339	23	11	24	11	24	1948-1988 and "1968-2008": why comparing two periods with 20 years of overlapping? (Cassardo, Claudio, University of Torino)
340	23	11	27	0	0	Change "Northwestern" to "Northeastern". (Parker, David, Met Office Hadley Centre)
341	23	11	28	11	29	typo: "(Switzerland (Schmocker" --> "(Switzerland: Schmocker". Later, "Germany (Bormann" --> "Germany; Bormann" (Cassardo, Claudio, University of Torino)
342	23	11	29	11	29	Here a reference to Wilson et al. (2010) could be added after Germany, i.e.: The Nordic countries (Wilson et al. (2010) (Hisdal, Hege, Norwegian Water Resources and Energy Directorate)
343	23	11	31	11	31	what is river "training"?? (Wolf, Tanja, WHO Regional Office for Europe)
344	23	11	32	0	34	The phrase needs improvement grammatically; also, its meaning is not very clear (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
345	23	11	33	11	33	again, I suggest to leave the argument of attribution to anthropogenic forcing out. (Wolf, Tanja, WHO Regional Office for Europe)
346	23	11	36	0	0	The following article may be suitable for this paragraph since the results from the 20-km and 60-km mesh AGCMs are used in AR5 WG I. for the regional climate projections: Nakaegawa, T., A. Kitoh, M. Hosaka. 2013: Discharge of major global rivers in the late 21st century climate projected with the high horizontal resolution MRI-AGCMs -overview-. Hydrological Processes. 27. DOI: 10.1002/hyp.9831 (Nakaegawa, Toshivuki, Meteorological Research Institute)
347	23	11	36	11	45	Please clarify timing. Is this change projected for the next decades or at the end of the 21st century? (GERMANY)
348	23	11	36	11	45	It is important to remember that changing flood magnitudes in a future climate to a large extent will depend on the dominating flood generating processes (snowmelt or rain) in present day climate and in a future climate. This is illustrated in a detailed study for Norway (Lawrence and Hisdal, 2011) Ref: Lawrence, D., Hisdal, H. (2011). Hydrological projections for floods in Norway under a future climate. NVE Report no. 2011-5, 47 pp - to be found at: http://webby.nve.no/publikasjoner/report/2011/report2011_05.pdf (Hisdal, Hege, Norwegian Water Resources and Energy Directorate)
349	23	11	36	11	45	(Effect of future climate change on the hydrology of river basins and river flow etc.): Does this text match the changes anticipated in Precipitation? Not clear at first glance. Perhaps, more explanatory text is needed. (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
350	23	11	36	11	45	Examples for river flow impact studies for Belgium and the river Scheldt basin are (they show peak flow increases in winter but decreases in summer): • Vansteenkiste, Th., Tavakoli, M., Ntegeka, V., Willems, P., De Smedt, F., Batelaan, O. (2013), 'Climate change impact on river flows and catchment hydrology: a comparison of two spatially distributed models', Hydrological Processes; doi: 10.1002/hyp.9480 • Dams, J., Salvatore, E., Van Daele, T., Ntegeka, V., Willems, P., Batelaan, O. (2012). 'Spatio-temporal impact of climate change on the groundwater system', Hydrology and Earth System Sciences, 16(5), 1517-1531 • Poelmans, L., Van Rompaey, A., Ntegeka, V., Willems, P. (2011), 'The relative impact of climate change and urban expansion on river flows: a case study in central Belgium', Hydrological Processes, 25(18), 2846-2858 (Willems, Patrick, KU Leuven)
351	23	11	36	44	45	Substantial declines in low flows are also projected over the whole of France by the 2050s (Chazot et al., 2013). Chazot, S., Chauveau, M., Perrin, C., Bourgin, P.-Y., Sauquet, E., Vidal, J.-P., Rouchy, N., Martin, E., David, J., Norotte, T., Maugis, P., and de Lacaze, X. (2013) What impacts of climate change on surface hydrology in France by 2070? Houille Blanche-revue Internationale De L Eau, accepted (Vidal, Jean-Philippe, Irstea)
352	23	11	39	11	43	The following reference is also relevant in this context: Görgen, Klaus: Assessment of climate change impacts on discharge in the Rhine River Basin: Results of the RheinBlick2050 project. Lelystad : CHR, 2010. - ISBN 978-90-70980-35-1 " for the use of a weather generator to optimize inputs for hydrological models. (Ferrone, Andrew, Public Research Centre - Gabriel Lippmann)
353	23	11	39	11	45	Consider adding the report I-23 of the CHR for this paragraph. It contains information on changes in high, mean and low flow for the Rhine River based on a 20 member ensembles of discharge projections. Citation: Görgen, K., Beersma, J., Brahmer, G., Buiteveld, H., Carambia, M., de Keizer, O., Krahe, P., Nilson, E., Lammersen, R., Perrin, C. and Volken, D. (2010) Assessment of Climate Change Impacts on Discharge in the Rhine River Basin: Results of the RheinBlick2050 Project, CHR report, I-23, 229 pp., Lelystad, ISBN 978-90-70980-35-1. Available online: http://www.chr-khr.org/files/CHR_I-23.pdf . Suggestion: add in line 45: Ensemble projections based on 20 climate model runs have been carried out for the Rhine river by Görgen et al. (2010). For the middle of the 21st century they show moderate changes (+/-10%) in mean and low flow during the hydrological summer half year and increasing flows during the winter (0% to 20%) at relevant gauges in the catchment. For the end of the 21st century the majority of projections points towards decreasing mean and low flows during the summer (-10% to -25%), while winter flows continue to rise. (GERMANY)
354	23	11	41	0	0	Another projection for the Rhine River can be found in Nakaegawa et al. (2013): Nakaegawa, T., A. Kitoh, M. Hosaka. 2013: Discharge of major global rivers in the late 21st century climate projected with the high horizontal resolution MRI-AGCMs -overview-. Hydrological Processes. 27. DOI: 10.1002/hyp.9831 (Nakaegawa, Toshiyuki, Meteorological Research Institute)
355	23	11	42	11	42	Krahe et al. (2009) does not contain specific information on Rhine extreme discharges. Cf. comment on chapter 23 page 11 lines 39 to 45 (GERMANY)
356	23	11	43	0	0	Another projection for the Danube River can be found in Nakaegawa et al. (2013): Nakaegawa, T., A. Kitoh, M. Hosaka. 2013: Discharge of major global rivers in the late 21st century climate projected with the high horizontal resolution MRI-AGCMs -overview-. Hydrological Processes. 27. DOI: 10.1002/hyp.9831 (Nakaegawa, Toshiyuki, Meteorological Research Institute)
357	23	11	47	12	2	A method for assessing the different types of droughts (meteorological, agricultural and hydrological) in a consistent way through the hydrological cycle using standardized indices has been proposed by Vidal et al. (2010). Vidal, J.-P., Martin, E., Franchistéguy, L., Habets, F., Soubeyroux, J.-M., Blanchard, M., and Baillon, M. (2010) Multilevel and multiscale drought reanalysis over France with the Safran-Isba-Modcou hydrometeorological suite. Hydrology and Earth System Sciences, 14(3), 459-478. doi: 10.5194/hess-14-459-2010 (Vidal, Jean-Philippe, Irstea)

#	Ch	From Page	From Line	To Page	To Line	Comment
358	23	11	51	11	54	The region affected by changes in droughts can be extended up to the UK, as Vidal and Wade (2009) found a (dramatic) increase in short droughts in the southern part of England.\n- Vidal, J.-P. and Wade, S. D. (2009) A multimodel assessment of future climatological droughts in the United Kingdom. International Journal of Climatology, 29(14), 2056-2071. doi: 10.1002/joc.1843 (Vidal, Jean-Philippe, Irstea)
359	23	11	51	11	54	Vidal et al. (2012) also found a dramatic increase in spatio-temporal characteristics (duration, affected area, total magnitude) of droughts in France over the 21st century.\n- Vidal, J.-P., Martin, E., Kitova, N., Najac, J., and Soubeyroux, J.-M. (2012) Evolution of spatio-temporal drought characteristics: validation, projections and effect of adaptation scenarios. Hydrology and Earth System Sciences, 16(8), 2935-2955. doi: 10.5194/hess-16-2935-2012 (Vidal, Jean-Philippe, Irstea)
360	23	11	53	11	53	After Tsanis et al., 2011 you can add Koutroulis et al., 2010 (7. Koutroulis A.G., Vrochidou A., Tsanis I.K., "Spatial and temporal characteristics of droughts for the island of Crete", Journal of Hydrometeorology, 2010, doi: 10.1175/2010JHM1252.1) as a reference. (Aristeidis Koutroulis, Water Resources Management & Coastal Engineering Laboratory, Technical University of Crete, Greece) (GREECE)
361	23	12	1	12	2	While this is conceptually plausible, it might be useful to show projected changes (model derived) in soil moisture and evapotranspiration. To be noted, these are 2nd or 3rd order parameters that are subject to considerably larger uncertainties than for example 1st order parameters such as temperature. (UNITED STATES OF AMERICA)
362	23	12	4	0	6	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
363	23	12	4	12	4	dry spells needs explanations. In what is dry spell different from drought. An opportunity to shed light on the complexity mentioned in the beginng of the paragraph. (Wolf, Tanja, WHO Regional Office for Europe)
364	23	12	4	12	6	It should be noted here that the length of dry spells is a poor indicator of meteorological droughts, and an even poorer indicator of hydrological droughts. It would be therefore much more appropriate to include here a figure from the FP6 EU WATCH projetc (www.eu-watch.org) showing multi-GCM and multi hydrological model changes in low flow indices. (Vidal, Jean-Philippe, Irstea)
365	23	12	4	12	6	For the described differences across scenarios, how much of the difference is due to the emission scenario versus the modeling group/project? (Mach, Katharine, IPCC WGII TSU)
366	23	12	5	12	5	typo: "scenariothe" --> "scenario the" (Cassardo, Claudio, University of Torino)
367	23	12	18	15	3	in 23.3 the subsections settlements and housing are not really separate. I suggest to merge them and subgroup by phenomenon (related to temperature or precipitation) and explain the general pathways beforehand. Even the section on transport would benefit from beeing integrated this way. (Wolf, Tania, WHO Regional Office for Europe)
368	23	12	18	17	27	Do the seven areas covered in 23.3 represent the complete range of Production Systems and Physical Infrastructure? (UNITED STATES OF AMERICA)
369	23	12	22	12	29	specify references\n\n (NETHERLANDS)
370	23	12	26	12	26	If "likely" is being used as calibrated uncertainty language, reflecting a probabilistic basis for its assignment, it should be italicized. Casual usage of the reserved likelihood term should be avoided. (Mach, Katharine, IPCC WGII TSU)
371	23	12	27	12	27	The message is wrong here. It is not a mater of upgrading flood deferences. It is a mater of adopting as soon as possible a (no-cost) policy to refrain from placing anything or at least critical infrastructure between the contours of 0 and 1 meters elevation if that is the expected rise. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
372	23	12	33	12	44	Also neede to consider new cost numbers from Brown et al.: Mitigation or adaptation? Impacts of sea-level rise in the EU in the 21st century. Submitted to Climatic Change (Brown, Sally, University of Southampton)

#	Ch	From Page	From Line	To Page	To Line	Comment
373	23	12	36	12	36	I would be interested to know the definition of “exposed” here. Is it the zone between 0 and 1 meters of elevation or a wider zone? (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
374	23	12	36	12	36	There should be more specific reference to port facilities and infrastructure in this section. (UNITED STATES OF AMERICA)
375	23	12	37	12	37	A reference here may be as follows: Melchiorre and Frattini, 2012. These authors reported that: “The uncertainties in the predicted extreme precipitation events, soil parameters, and antecedent precipitation conditions do not allow any accurate estimation of changes in stability conditions for shallow landslides.” Melchiorre, C., Frattini, P., 2012, Modelling probability of rainfall-induced shallow landslides in a changing climate, Otta, Central Norway, Climatic Change, 113 (2), pp. 413-436. (Borga, Marco, University of Padova)
376	23	12	37	12	38	The authors could consider citing the work of Krestenitis et al. (2011) about storm surge events in north-eastern Mediterranean. (Citation: Krestenitis, Y.N., Androulidakis, Y.S., Kontos, Y.N. and Georgakopoulos, G. (2011). Coastal inundation in the north-eastern Mediterranean coastal zone due to storm surge events, Journal of Coastal Conservation, 15(3): 353–368). (Dimitris Damigos, Mining and Metallurgical Engineering, NTUA, Greece) (GREECE)
377	23	12	39	12	40	(Without adaptation, number of people affected...projected to increase.....under SRES B2 and A2 scenarios....): Comment: Appears to be no internal consistency in the scenarios used in the references studies scattered throughout the report. Perhaps it does not matter. But it raises a point of curiosity as regards IPCC protocol? (UNITED STATES OF AMERICA)
378	23	12	41	12	42	Supress this sentence. Of course continental and alpine are not subject to coastal flood. (Pecheux, Martin, Institut des Foraminifères Symbiotiques)
379	23	12	42	12	42	Where the upper bound of 17 billion is given here, it would be preferable to give the full range in terms of a lower and upper bound to the estimate. (Mach, Katharine, IPCC WGII TSU)
380	23	12	43	12	43	How “highest” is defined here? Is it in absolute terms or e.g. as a % of the countries GDP for example. I am surprised to see that countries with extensive coastline are not part of the most affected. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
381	23	12	43	12	43	The term "with wider costs being higher" is not clear. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
382	23	12	43	12	44	Clarify whether "The highest damage costs" refer to absolute costs or to costs per person or to costs as a percentage of GDP. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
383	23	12	50	12	58	(\$ impact calculations for a 1 meter sea level rise in Turkey and increasing flood risk on the Baltic coast): The \$ numbers and the # of people affected are large (3 million people and \$12 billion capital value at risk, and adaptation costs of \$20 billion—in the Turkey example. Comment: Impact cost and adaptation cost will both depend on the rate of change in sea level in the case of Turkey. While these are interesting findings, have these studies considered rate of change as opposed to a step function change. Not clear from the text. (UNITED STATES OF AMERICA)
384	23	12	51	12	52	If this study provided ranges in addition to best estimates for the projected outcomes, it would be preferable to indicate them. (Mach, Katharine, IPCC WGII TSU)
385	23	12	52	12	52	The reference Karaca and Nicholls does not have a year of publication. (UNITED STATES OF AMERICA)
386	23	13	2	13	2	The distinction reported in the title between River and Pluvial is not completely relevant, given the content of the Section. Pluvial flooding occurs as a consequence of direct rainfall on urban areas that exceeds the capacity of urban drainage systems. It can cause severe damage and disruption to buildings, urban infrastructure systems and people. It is of course relevant to the flooding problem, but is seems to me a case of flash flooding, which is a broader type of flooding mechanism. I would suggest to modify the title as follows: “River and flash flooding”. (Borga, Marco, University of Padova)

#	Ch	From Page	From Line	To Page	To Line	Comment
387	23	13	4	13	47	well documented observed increase in increased trends in flood disasters and damages is not congruent to "large uncertainties" as stated on p 11 line 23?? Perhaps on page 11 you better say "differences across Europe" as the spatial patterns are then detailed. (Wolf, Tania, WHO Regional Office for Europe)
388	23	13	13	13	15	For this projection, it would be preferable to specify the relevant climate/socioeconomic scenario as well as the relevance of different drivers and assumptions (for example, trends in exposure versus trends in flooding). (Mach, Katharine, IPCC WGII TSU)
389	23	13	14	14	22	Section 23.3.2 summarizes housing and is focused on the impact of temperature change. Increased intensity and frequency of extreme weather (e.g., coastal storms with strong winds, extreme rains, etc) have an impact on buildings and building codes. And, there are other examples of extreme weather having an impact on urbanized environment (e.g., urban areas and air pollution). (UNITED STATES OF AMERICA)
390	23	13	19	0	0	This is not true. Several studies exist on the impacts of intense rainfall on pluvial flooding (overview is given in Willems et al., 2012); see previous comment. (Willems, Patrick, KU Leuven)
391	23	13	19	13	22	The combined studies under the Intergrated Flood Management sytem sponsored by the Global Water Partnership and the WMO contains many examples of adapation drawn from hydrometeorological services around the world. (UNITED STATES OF AMERICA)
392	23	13	20	0	0	another study which evaluates future damages from inundation in response to an increase in intense rainfall is Dumas, Patrice, Stéphane Hallegatte, Pere Quintana-Seguí, et Eric Martin. 2013. « The influence of climate change on flood risks in France -- first estimates and uncertainty analysis ». Natural Hazards and Earth System Sciences (march): 809?821.\n (Viguié, Vincent, CIRED)
393	23	13	21	13	21	A sentence may be added here to underline the different impacts of land use/land cover change and projected changes in precipitation regime on different types of floods. "Marchi et al. (2010) showed that extreme flash floods in Europe are characterized by reduced runoff to rainfall volume ratios. They hypothesized that flash floods may be more sensitive to land use/land cover changes than to modification in the rainfall intensities, particularly in Central Europe." \n Marchi L., M. Borga, E. Preciso and E. Gaume, 2010, Characterisation of selected extreme flash floods in Europe and implications for flood risk management. J. of Hydrology, 394 (1–2), 118–133. doi:10.1016/j.jhydrol.2010.07.017. (Borga, Marco, University of Padova)
394	23	13	25	13	25	Better Landslides as title than mass movement, which can be many thing. (Pecheux, Martin, Institut des Foraminifères Symbiotiques)

#	Ch	From Page	From Line	To Page	To Line	Comment
395	23	13	25	13	41	The text report that very few studies are available on observed trends or future projections in the frequency of landslides. Actually, a number of studies were reported in the period 2010-2013. A few of these are listed below: Coe, J.A. and Godt, J.W., 2012, Review of approaches for assessing the impact of climate change on landslide hazards, In Eberhardt, E., Froese, C., Turner, A.K., and Leroueil, S., eds., Landslides and Engineered Slopes, Protecting Society Through Improved Understanding: Proceedings of the 11th International and 2nd North American Symposium on Landslides and Engineered Slopes, Banff, Canada, 3-8 June, Taylor & Francis Group, London, v. 1, p. 371-377. http://landslides.usgs.gov/docs/coe/CoeGodt2012.pdf Coe, J.A., 2012, Regional moisture balance control of landslide motion: Implications for landslide forecasting in a changing climate. <i>Geology</i> , 40 (4), pp. 323-326. Dijkstra, T.A., Dixon, N., 2010, Climate change and slope stability in the UK: Challenges and approaches, <i>Quarterly Journal of Engineering Geology and Hydrogeology</i> , 43 (4), pp. 371-385. Jomelli, V., Brunstein, D., Déqué, M., Vrac, M., Grancher, D., 2009, Impacts of future climatic change (2070-2099) on the potential occurrence of debris flows: A case study in the Massif des Ecrins (French Alps), <i>Climatic Change</i> , 97 (1), pp. 171-191. Melchiorre, C., Frattini, P., 2012, Modelling probability of rainfall-induced shallow landslides in a changing climate, Otta, Central Norway, <i>Climatic Change</i> , 113 (2), pp. 413-436. Saez, J.L., Corona, C., Stoffel, M., Berger, F., 2013, Climate change increases frequency of shallow spring landslides in the French Alps, <i>Geology</i> , 41 (5), pp. 619-622. Stoffel, M., Huggel, C., 2012, Effects of climate change on mass movements in mountain environments, <i>Progress in Physical Geography</i> , 36 (3), pp. 421-439. (Borga, Marco, University of Padova)
396	23	13	25	13	41	Section 23.3.1 describes climate change impact on settlements but is limited to impacts of flooding and heavy-precipitation-derivative impacts. There are other forms of extreme weather (eg, frequency and intensity of tornadoes, tropical cyclones, winter storms) which will impact growing populations. If data do not support such statements, text would be strengthened with statements to that effect. (UNITED STATES OF AMERICA)
397	23	13	27	13	34	Healthy forests can reduce the frequency of shallow landslides. See report by Bruijnzeel, L.A., 1990 <i>Hydrology of Moist Tropical Forests and Effects of Conversion: A State of Knowledge Review</i> . Humid Tropics Programme, UNESCO International Hydrological Programme, UNESCO, Paris (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
398	23	13	28	13	32	The combined effect concerning the formation of new lakes in deglaciating high mountains and the decreasing stability of steep mountain flanks due to glacial debuitressing and permafrost warming/degradation causes a systematically increasing probability of large and far reaching floods from impact waves triggered by rock/ice avalanches into new lakes (cf. Haeberli, W. (2013): <i>Mountain permafrost — research frontiers and a special long-term challenge</i> . <i>Cold Regions Science and Technology</i> . http://dx.doi.org/10.1016/j.coldregions.2013.02.004) (Haeberli, Wilfried, University of Zurich)
399	23	13	32	0	34	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
400	23	13	34	0	35	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
401	23	13	34	13	34	Apennines (not Apenines) if you mean the mountains in Italy (Wolf, Tanja, WHO Regional Office for Europe)
402	23	13	34	13	34	medium confidence should be italicized. Directness of wording would be maximized if it were placed parenthetically at the end of the sentence. (Mach, Katharine, IPCC WGII TSU)
403	23	13	46	13	46	missing reference (NETHERLANDS)

#	Ch	From Page	From Line	To Page	To Line	Comment
404	23	13	46	13	54	This section's content might be better placed under the energy section. Housing adaptation should include concepts such as housing design incorporating southern exposure of walls and windows, shading, interior courtyards, roofing design to fit the climate zones and natural hazards, etc. (UNITED STATES OF AMERICA)
405	23	13	50	13	50	it is not only temperature (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
406	23	13	51	13	52	Not clear. (Costas Balaras, Institute for Environmental Research and Sustainable Development, National Observatory of Athens, Greece) (GREECE)
407	23	13	52	13	54	In the chapter 8, page 22 lines 31-32 is stated that it is still unclear whether the climate change will magnify UHI effects. Additionally the study of Lemonsu et al(2011) on the climate change in the region of Paris showed a strikingly different change in the energy demand. The evolution of the Parisian urban climate under a changing climate showed a 30% decrease of heating degree days and a strong increase in summer time cooling degree days. However, in terms of accumulated degree days, the increase of the demand for cooling for Paris remained smaller than the decrease of the demand in heating. Citation: Lemonsu et al, 2013, in Climatic Change (2013) 116:679–692: Evolution of the Parisian urban climate under a global changing climate. This may be due to the different climate or different assumptions in the modeling setup, nevertheless this contradiction should be discussed or at least mentioned. (Trusilova, Kristina, Deutscher Wetterdienst)
408	23	13	53	13	53	Instead of presenting the values "up to," the full range of projected outcomes should be presented, including lower and upper bounds. (Mach, Katharine, IPCC WGII TSU)
409	23	13	53	13	54	these percentages are not referred to the baseline, thus the variations are difficultly to manage (Cassardo, Claudio, University of Torino)
410	23	14	4	14	5	The priorities should be solar shading and then thermal mass. (Costas Balaras, Institute for Environmental Research and Sustainable Development, National Observatory of Athens, Greece) (GREECE)
411	23	14	5	14	5	Where evidence is described here, the chapter team could consider presenting a summary term for evidence (and also a summary term for agreement) from the uncertainties guidance for authors. (Mach, Katharine, IPCC WGII TSU)
412	23	14	8	14	12	The entire paragraph is not well merged in the context of the section on Housing. Difficult to see the relevance.(Costas Balaras, Institute for Environmental Research and Sustainable Development, National Observatory of Athens, Greece) (GREECE)
413	23	14	9	14	9	Casual usage of "likely" should be avoided, as it is a reserved likelihood term. (Mach, Katharine, IPCC WGII TSU)
414	23	14	12	14	12	again Corti et al 2009 as reference? (Wolf, Tanja, WHO Regional Office for Europe)
415	23	14	12	14	12	The last sentence may not be needed. If countries were adapted they would not suffer the consequences of soil subsidence. (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
416	23	14	14	14	14	limited evidence should be italicized. Also, directness of wording would be maximized if it were placed parenthetically at the end the sentence. (Mach, Katharine, IPCC WGII TSU)
417	23	14	14	14	22	There exist a couple of other articles on that topic using very different approaches (e.g., urban land surface scheme in a regional climate model, e.g., Trusilova K, Jung M, Churkina G, Karstens U, Heimann M, and Claussen M (2008) Urbanization Impacts on the Climate in Europe: Numerical Experiments by the PSU/NCAR Mesoscale Model (MM5). Journal of Applied Meteorology and Climatology, 47 (5): 1442-1455; Früh B, Becker P, Deutschländer T, Hessel J-D, Koßmann M, Mieskes I, Namyslo J, Roos M, Sievers U, Steigerwald T, Turau H, Wienert U (2011) Estimation of Climate-Change Impacts on the Urban Heat Loading Using an Urban Climate Model and Regional Climate Projections. Journal Applied Meteorology and Climatology 50: 167-184) which should also be discussed and referred to. (GERMANY)

#	Ch	From Page	From Line	To Page	To Line	Comment
418	23	14	19	14	21	The expectation of urban heat island to increase in the future, supported by the work of Wilby (2008), cannot be applied universally to the whole of Europe and the case of London alone should not be used as a typical example here. The UHI as the difference between the urban and the rural temperatures does not have to increase with the ongoing climate change. For example the study of Lemonsu et al (2013) indicated a systematic increase of 2-meter air temperature in the area of Paris, however, during summer, the warming trend was found to be more pronounced in the surrounding countryside than in Paris and suburbs due to the soil dryness. As a result, a substantial decrease of the strong urban heat islands was noted at nighttime, and numerous events with negative urban heat islands appear at daytime (Citation: Lemonsu et al, 2013, in Climatic Change (2013) 116:679–692: Evolution of the Parisian urban climate under a global changing climate). (Trusilova, Kristina, Deutscher Wetterdienst)
419	23	14	20	14	22	Modelling study by Bohenstengel et al. (2011) Simulations of the London urban heat island. Quarterly Journal of the Royal Meteorological Society, 137, pp.1625-1640 shows that significant greening (>20%) could be needed before the UHI is reduced. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
420	23	14	21	14	22	reference for last sentence? Again Wilby 2008? However, as mentioned above, I don't see why this statement on urban heat island is in "housing" rather than "settlement" (Wolf, Tanja, WHO Regional Office for Europe)
421	23	14	22	14	22	Here it is important to note that the UHI strongly depends on the climate type and the projected climate trend for the particular area. Therefore more studies on the UHI in European cities in different climates have to be discussed or at least mentioned. I suggest to read and include the results of the study on the UHI of Madrid by Salamanca et al (2011) and the study on the UHI of Frankfurt am Main by Früh et al (2011). Citation 1: Salamanca et al (2011) in Int. J. Climatol., DOI: 10.1002/joc.3398: A numerical study of the Urban Heat Island over Madrid during the DESIREX (2008) campaign with WRF and an evaluation of simple mitigation strategies. Citation 2: Früh et al. (2011) in J. Appl. Meteorol. Clim. 50: 167 - 184: Estimation of Climate-Change Impacts on the Urban Heat Load Using an Urban Climate Model and Regional Climate Projections. (Trusilova, Kristina, Deutscher Wetterdienst)
422	23	14	25	15	3	Section 23.3.3 (Transport) is rather short, yet the implications of climate change on transportation and transportation infrastructure are numerous and significant. For example, highways are part of the physical infrastructure, and climate-change induced swings in temperature extremes will impact highways. Extreme weather impacts air, sea and land transportation from both safety and economic perspectives: air traffic delays in the US alone are estimated at \$40B per year and approximately two thirds are caused by adverse weather increases in adverse weather combined with the growing airline industry will almost certainly increase that number. And the congestion in air traffic over Europe will result in similar, if not greater, economic (and safety) impacts (UNITED STATES OF AMERICA)
423	23	14	30	0	32	Such a direct link between lower traffic speed and loss of welfare is quite doubtful; it should not feature as of universal validity. (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
424	23	14	30	14	35	On Road transport: This is interesting, Future snow and ice will decrease, however this will lessens a country's and an individual's capacity to cope with such conditions and hence may cause an increase in road collisions. Witness the failure of UK drivers and the transport system to cope with infrequent and minor snow falls compared with that of Norway, whose drivers and transport infrastructure copes with adverse conditions. (Viner, David, Private)
425	23	14	34	14	35	Clarify whether this large reduction in accidents is due to climate change only or also due to other (e.g. Socio-economic and technical) developments. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
426	23	14	35	14	35	Is 2020-2070 really the timeframe used in the underlying study? (Mach, Katharine, IPCC WGII TSU)

#	Ch	From Page	From Line	To Page	To Line	Comment
427	23	14	37	14	41	Climate effects on UK rail studied in paper by Palin et al. (2013) Future projections of temperature-related climate change impacts on the railway network of Great Britain, Climatic Change, under review. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
428	23	14	43	14	46	The following reference is also relevant in this context: Görgen, Klaus: Assessment of climate change impacts on discharge in the Rhine River Basin: Results of the RheinBlick2050 project. Lelystad : CHR, 2010. - ISBN 978-90-70980-35-1 " for the use of a weather generator to optimize inputs for hydrological models. (Ferrone, Andrew, Public Research Centre - Gabriel Lippmann)
429	23	14	43	14	46	This text focuses on climate futures which are connected with adverse effects for inland navigation. The ensemble of discharge projections that is now available for the Rivers Rhine (and Danube) contains several members showing different directions of change. In addition, the effect of reduced river icing is not mentioned. Consider adding reference to report 1.4 of the EU-funded project ECCONET: Nilson, E., Lingemann, I., Klein, B., Krahe, P. (2012): Impact of Hydrological Change on Navigation Conditions. ECCONET report 1.4. Available online: http://www.econet.eu/deliverables/ECCONET_D1.4_final.pdf (GERMANY)
430	23	15	0	0	0	The section 23.3.4 does not cover "Distribution" which is implied by the section title. In addition, the section only covers the building sector but not other end uses. (Costas Balaras, Institute for Environmental Research and Sustainable Development, National Observatory of Athens, Greece) (GREECE)
431	23	15	1	15	3	This section misses the important issue of runway length. Hotter temperatures and more humid air means lower air density. "Density altitude" raises the virtual runway elevation; longer take-off rolls are required for liftoff. Already, even new airports at high elevations, Denver Colorado, for example, have to restrict the largest fully loaded aircraft to cooler nighttime take offs and landings. (UNITED STATES OF AMERICA)
432	23	15	3	15	3	In 2010 the European Organisation for Safety of Air Navigation reported on changes in convective available potential energy (CAPE), a measure of instability in the atmosphere, over Europe's busiest airspace (Maastricht). The study shows possible future increases in weather phenomena associated with severe convection over Europe by the 2020s with the largest changes indicated for summer months. By the 2050s, spring and autumn showed measureable increases too. (Eurocontrol, 2010). Source: http://www.eurocontrol.int/sites/default/files/content/documents/official-documents/facts-and-figures/statfor/challenges-of-growth-climate-adaptation-march-2010.pdf (de Gusmao, Diogo, Met Office Hadley Centre)
433	23	15	6	15	54	Section 23.3.4 (Energy Production, Distribution and Use) is focused on production and use with little apparent on distribution. For example, when extreme weather occurs, above ground power lines are damaged by falling trees due to high winds or instability from rain soaked ground. (UNITED STATES OF AMERICA)
434	23	15	10	15	11	It would be preferable to specify the climate/socioeconomic scenario for this projection. (Mach, Katharine, IPCC WGII TSU)
435	23	15	11	15	13	This sentence is confusing - aren't there seasonal and spatial variations in energy density all over Europe? What is "energy density"? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
436	23	15	17	15	17	Cannot say power generation in Scandinavia will increase - results is based on a projection. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
437	23	15	17	15	19	Where values are presented "up to" and "even by" the chapter team should instead present the full range of projected outcomes, including lower and upper bounds. (Mach, Katharine, IPCC WGII TSU)

#	Ch	From Page	From Line	To Page	To Line	Comment
438	23	15	17	15	25	There are two additional relevant references recently published on the impact of climate change on hydropower production: Hendrickx and Sauquet (2013) in the Pyrenees and Finger et al. (2012) in the Swiss Alps.\n- Finger, D., Heinrich, G., Gobiet, A., and Bauder, A. (2012) Projections of future water resources and their uncertainty in a glacierized catchment in the Swiss Alps and the subsequent effects on hydropower production during the 21st century. Water Resources Research, 48, W02521. doi: 10.1029/2011WR010733\n- Hendrickx, F. and Sauquet, E. (2013) Impact of warming climate on water management for the Ariège River basin (France). Hydrological Sciences Journal, 58(4), 1-17. doi: 10.1080/02626667.2013.788790 (Vidal, Jean-Philippe, Irstea)
439	23	15	18	15	18	Instead of referring to Jóhannesson et al. (2012), the entire CES report should be referenced here: Thorsteinsson, Th., and H. Björnsson, eds. Climate Change and Energy Systems. Impacts, Risks and Adaptation in the Nordic and Baltic Countries. Nordic Council of Ministers, TemaNord 2011:502, 91–111. The Chapter by Jóhannesson et al. is only about glaciers, snow and ice. The effect on energy production as such is handled in other chapters. (ICELAND)
440	23	15	20	15	20	reductions of what ?\n\n (NETHERLANDS)
441	23	15	21	15	22	The publication year of the Paiva et al. study is actually 2010.\n- Paiva, R., Collischonn, W., Schnetterling, E. B., Vidal, J.-P., Hendrickx, F., and Lopez, A. (2010) The Case Studies. Chapter 6 in Modelling the impact of climate change on water resources [Fung, F.; Lopez, A. & New, M. (ed.)], Wiley-Blackwell, Chichester, UK. pp. 203 (Vidal, Jean-Philippe, Irstea)
442	23	15	27	0	27	Biofuel production is covered in section 23.4.5 (not 6) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
443	23	15	27	0	28	Some information could be given regarding solar energy as a source to cover the increased energy demands in Europe because of climate change focusing also on the environmental impacts of solar panels. (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
444	23	15	27	15	27	In my opinion the correct question is how solar energy production impacts on climate change. When discussing in line 35 energy demand it is a totally different case if this demand is covered by fossil fuels or by solar energy. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
445	23	15	28	15	30	Clarify whether the "lower figures" refer to a smaller decrease or to a lower usable capacity (which would imply a larger decrease). (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
446	23	15	30	15	39	The 3.7°C scenario should be clarified--by 2050?! Or by the end of the century even though results are given for 2050? (Mach, Katharine, IPCC WGII TSU)
447	23	15	31	15	33	Are there any estimates of changes in transmission efficiency? Higher temperatures lead to increased resistance of power lines and so higher power losses. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
448	23	15	32	15	32	lighting or "lightning"? (UNITED STATES OF AMERICA)
449	23	15	35	15	36	Will energy demand in Europe really decrease? Sentence on p.4 lines 8-10 states that cooling demand will increase owing to higher incomes, implying greater energy usage. Fig.23-5 shows that electricity demand will increase with climate change, at least over Greece. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
450	23	15	38	15	38	What is a "+3.7 C scenario"? Is this a temperature rise by 2100? Is it from an RCP? Other chapters consider a +2 and +4 C world - is this scenario related to these global mean temperature rises? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
451	23	15	39	15	42	It would be preferable to specify the relevant climate/socioeconomic scenario for this estimated outcome. (Mach, Katharine, IPCC WGII TSU)

#	Ch	From Page	From Line	To Page	To Line	Comment
452	23	15	46	15	50	Some reference to EPBD transposition and the anticipated impact of nearly-zero energy buildings should be included to substantiate the anticipated benefits (in addition to passive cooling etc). Interesting to note that EPBD that is the main main legislative instrument for improving the energy efficiency of European buildings and is part of the EU initiatives on climate change, is not referenced. (Costas Balaras, Institute for Environmental Research and Sustainable Development, National Observatory of Athens, Greece) (GREECE)
453	23	16	0	0	0	Section 23.3.5. This discussion here is shallow. Manufacturing can follow land use changes, adaptation should be focused on not placing industrial infrastructure along the coast. I also do not understand why crop production (part of primary sector/agriculture) is mentioned here where the focus is on the secondary sector (indust./manufact)? (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
454	23	16	0	0	0	The section 23.3.5 needs to be expanded; it is very short.(Costas Balaras, Institute for Environmental Research and Sustainable Development, National Observatory of Athens, Greece) (GREECE)
455	23	16	0	45	0	Essentially nothing can be said about this sector given present economic, banking, and insurance theory and practice. All these industries react on a relatively short time scale. The IPCC should perhaps eliminate topical or thematic areas that are well outside the scope of the IPCC. This comment may apply to many other sub-sections of this report as well as all other IPCC regional reports. This is not to say that the discussion of these subjects are not useful. They are, but are highly unlikely to lead to any policy or structural change as such or at any time. Response will typically and always be within a time horizon of a year or a few years at best. This begs the question as to why the IPCC should be involved in making assessments in such areas at all? Make a more concerted effort to tie it to the topic at hand. As an example, since AR4, the reinsurance industry has shown dramatically enhanced ability and interest in incorporating climate change into their decisionmaking. (UNITED STATES OF AMERICA)
456	23	16	3	16	10	Paper by Kirsty Lewis & Claire Witham (2012): Manufactured commodities and climate change, Climate Policy, 12:sup01, S62-S72 addresses some impacts of climate change on manufactured goods. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
457	23	16	3	16	10	Section 23.3.5 (Industry and Manufacturing) is noticeably short. It reads like a collection of randomly selected implications with no apparent purpose other than to present a few diverse examples. Authors should give serious consideration to find and document examples of which there are many. (UNITED STATES OF AMERICA)
458	23	16	5	16	5	Mentioning sales of ice creams seems to trivialize the issue of climate change. (UNITED STATES OF AMERICA)
459	23	16	5	16	5	Are soft drinks and ice cream the most significant examples to provide here? (Mach, Katharine, IPCC WGII TSU)
460	23	16	5	16	10	Perhaps the authors could consider acknowledging that European cement and steel industries are forced to take on additional costs related to climate change (e.g. GHG reductions), while in other steel producing countries these actions are mostly voluntary. As a result, European producers are put at a cost disadvantage and the sectors' long-term attractiveness is diminishing. (Dimitris Damigos, Mining and Metallurgical Engineering, NTUA, Greece) (GREECE)
461	23	16	5	16	10	The authors could consider citing the work of Damigos (2012) that monetizes the impacts of climate change on mining industry in the Mediterranean Region, as an example. (Citation: Damigos, D. (2012). Monetizing the impacts of climate change on the Greek mining sector, Mitigation and Adaptation Strategies for Global Change, 17, pp. 865–878). (Dimitris Damigos, Mining and Metallurgical Engineering, NTUA, Greece) (GREECE)
462	23	16	10	16	10	Casual usage of "likely" should be avoided. (Mach, Katharine, IPCC WGII TSU)
463	23	16	12	16	42	This part should be harmonized with chapter 10.6.1 - european results etc. (Matzarakis, Andreas, Albert-Ludwigs-University Freiburg)

#	Ch	From Page	From Line	To Page	To Line	Comment
464	23	16	12	16	42	The findings should mostly highlight the changes in seasonality, and not on the 'too hot or not' debate. The 'too hot' article is based on A1B scenario only, and deals with subjective issues under current conditions. A place may be not too hot but it can also be comparatively less attractive than another that is just 'hot enough for comfort'. Extrapolated from Moreno & The dominant trend in southern Europe is a decrease in good months in summer, whereas in northern Europe there will be an increase in good months in summer, spring and autumn. Interestingly, a coastal strip in southern Spain and Portugal is projected to maintain or even increase (HIRHAM-A2) its current season length. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
465	23	16	12	16	42	All these findings are based on TCI index, which has many limitations. And Tourism is a multisectoral, complex sector that needs further integration with other impacts. Also taken from Moreno & Amelung 2009: 'In particular in southern Europe, the worsening situation resulting from deteriorating thermal conditions is further aggravated by increasing water shortages. Peak demand from tourism coincides with peak demand from agriculture, residential areas, the energy sector and nature. It also coincides with the summer dip in water supply, which will very likely be deepened by climate change.' Other factors such as modified competition with other destinations, impacts in infrastructure, transport and mitigation policies, should be explored as well. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
466	23	16	14	16	22	This section should also use the Amelung et al reference to support the inference that the improvement of the tourism climate of the major European source countries (N. Europe) will improve and act as a further barrier to Southern Europe tourism. The reference to De Freitas should be deleted as it is superseded by Moreno and Moreno and Amelung. (Viner, David, Private)
467	23	16	14	16	42	Section 23.3.6 (Tourism) devotes much text to the impact of extreme temperatures on tourism and to the snow season impact on skiing. There are other important considerations. Increased impact of coastal storms, fire hazards, extreme weather in winter. Etc. (UNITED STATES OF AMERICA)
468	23	16	15	16	15	climate --> "climatic conditions" (Cassardo, Claudio, University of Torino)
469	23	16	16	0	16	Remove semi-colon from the end of the line (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
470	23	16	18	16	19	There are tourists in hotter places so this seems to overstate the dangers of heat. Will people not acclimatise to a changing climate in their holiday selection? (UNITED STATES OF AMERICA)
471	23	16	18	16	21	A significant finding, from Hein et al 2009: 'Tourism to north-western Spain would increase during the summer, while the total number of international summer tourists to Spain would sharply decline. From these projected changes, it is clear that climate change will have important impacts on tourist flows in Europe.' Thus, despite the region would not become 'too hot', impacts would be very significant. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
472	23	16	18	16	22	The relevant climate/socioeconomic scenarios could be clarified--or are these outcomes projected across scenarios? (Mach, Katharine, IPCC WGII TSU)
473	23	16	20	0	22	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
474	23	16	21	16	21	"too hot" says little about the thermal comfort. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)

#	Ch	From Page	From Line	To Page	To Line	Comment
475	23	16	24	16	27	The following reference is also relevant in this context: Matzarakis, A., J. Rammelberg, and J. Junk (2013), Assessment of thermal bioclimate and tourism climate potential for central Europe—the example of Luxembourg, Theoretical and Applied Climatology. (Ferrone, Andrew, Public Research Centre - Gabriel Lippmann)
476	23	16	30	16	42	The rapid vanishing of glaciers and the increasing slope instability due to permafrost degradation will increasingly influence mountaineering and summer tourism in the Alps. This marked and clearly recognizable impact of warming trends should at least be mentioned. (Haeberli, Wilfried, University of Zurich)
477	23	16	31	16	31	and also below lines 36-38: also snowmaking can be affected by heat wave or an equivalent cold wave (Cassardo, Claudio, University of Torino)
478	23	16	33	16	34	This reference Scott et al, is superfluous, it adds nothing to the review. (Viner, David, Private)
479	23	16	35	16	35	how demographic changes will affect skiing needs explaining. Again this is a matter of scientific writing. Some statements need a little bit more explaining to become complete. Then the reader can go to the reference cited for more. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
480	23	17	0	0	0	Section 23.4.1 the discussion here misses the point that “plant production” or agriculture is a land use. And as a land use it is interrelated to other land uses. In other words agriculture is not the only factor that will determine what will happen to agriculture. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
481	23	17	1	17	4	Perhaps it is worth mentioning here that green economy and green buildings is also a new market for banks? (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
482	23	17	6	0	7	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
483	23	17	9	17	10	You should mention here historical storminess (Ciavola, Paolo, University of Ferrara)
484	23	17	12	0	14	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
485	23	17	12	17	13	Groundwater extraction may also affect earthquake propagation and damages (González et al., (2012). Nature Geosciences 5: 821-825). There is a potential link here between climate change, water use and tectonic activity. (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
486	23	17	13	17	13	What does this mean - building suspense losses? Insured hail? Is there something missing from the sentence? (UNITED STATES OF AMERICA)
487	23	17	22	0	27	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
488	23	17	27	17	28	Add: "The current diversity of national insurance approaches is likely to persist, as it is rooted in culture and custom, and indeed diversity is a strength in meeting these new challenges (Schwarze, et al, 2011)." Cited almost from p.314 of http://ec.europa.eu/clima/policies/adaptation/what/docs/background_report_part1_en.pdf (worth as well to cite this Impact studies of EU!). Quote: Schwarze, R.; Schwindt, M.; Weck-Hannemann, H.; Raschky, P.; Zahn F.; Wagner, G. (2011): Natural Hazard Insurance in Europe: Tailored Responses to Climate Change are Needed. Environmental Policy and Governance. 21: 14–30. (Schwarze, Reimund, Helmholtz Leibniz)
489	23	17	30	0	0	Section 23.4. "Implications of Climate Change for Agriculture, Fisheries, Forestry and Bioenergy Production". There should be a sub-section for biodiversity, dealing with the implications climate change (and interactions with other changes) on biodiversity, particularly on terrestrial biodiversity. (Moreira, Bruno, Centre for Functional Ecology - University of Coimbra)

#	Ch	From Page	From Line	To Page	To Line	Comment
490	23	17	30	25	41	Is there a reason areas covered in 23.4 cover only Agriculture, Fisheries and Bioenergy production? Are there other topics which might be included in this section? Or at least an explanation of why these were chosen. (UNITED STATES OF AMERICA)
491	23	17	32	0	0	Section 23.4.1. Plant (food) production. Any reference to storage of agricultural products? (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
492	23	17	32	0	0	Section 23.4.1. In developing the final draft of the chapter, this section should be shortened as much as possible. (Mach, Katharine, IPCC WGII TSU)
493	23	17	39	17	39	missing parenthesis before table 23-5)\n\n (NETHERLANDS)
494	23	17	39	17	39	missing parenthesis before table 23-5)\n\n (NETHERLANDS)
495	23	17	39	17	42	these sentences seem to misinterpret the studies. They were not focused on yield variability but on changes in average yields. E.g. brisson showed that climate trends were depressing average yields, but did not really address yield variability. (Lobell, David, Stanford University)
496	23	18	0	0	0	Figure 23-6: "cell" is "plant cell"? (UNITED STATES OF AMERICA)
497	23	18	4	18	5	The text refers to a reduction of grape yield in Spain by up to 30kg/ha per millimeter of water deficit. How much of an impact is this? For reference, please add the average expected yield for unstressed conditions, or the percentage of change from that average under presented stress conditions, to allow user to assess the level of impact. (UNITED STATES OF AMERICA)
498	23	18	5	18	5	add "of water" after "millimetre" (Cassardo, Claudio, University of Torino)
499	23	18	12	18	12	Please introduce the concept of agroclimatic indices for the reader who is not familiar with them. (UNITED STATES OF AMERICA)
500	23	18	15	18	15	It is not clear why values 2.5 and 5.4 degrees C were selected for this study. Consultation of Table 23-1 shows that those values are not the extremes of the expected projections. An explanation of the reasons for that selection would be helpful. (UNITED STATES OF AMERICA)
501	23	18	16	18	16	Please quantify "small" in "...could lead to small changes in crop yield...". (UNITED STATES OF AMERICA)
502	23	18	22	18	27	The yield changes using the two GCMs are clearly very different - some discussion of this should be added here. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
503	23	18	24	18	25	unclear sentence formulation about the combination between disease, yield decline and atmospheric CO2 increase\n\n (NETHERLANDS)
504	23	18	29	18	29	Please specify under 2 different climate scenarios and which emission scenario\n\n (NETHERLANDS)
505	23	18	32	18	32	can a definition of "crop failure" be given here (Lobell, David, Stanford University)
506	23	18	33	18	33	Another reference about crop yield failure may be added. It is shown in the under mentioned paper, that is accepted with major revisions, that the diminution of yields of rainfed olive-tree will be higher than that of irrigated olive-tree in the middle of the 21st century. A multi model approach using 17 RCMs from the ENSEMBLE project has been used to predict future climate projection, allowing to compute the uncertainties of the resulting yields projections. The incertainties also depend on the water resources (river and underground) . Ronchail, J., Cohen, M., Alonso-Roldan M., Garcin, H., Angles, S. and Sultan, B.: Adaptability of Mediterranean agro systems to climate change. The example of the Sierra Mágina olive growing region (Andalusia, Spain) II The future. Submitted to Weather, Climate and Society (Ronchail, Josyane, LOCEAN - Laboratory of Oceanography and Climate)

#	Ch	From Page	From Line	To Page	To Line	Comment
507	23	18	49	0	0	Figure 23-6: and text before in this sub-section: Comment: The scenarios used are A1B (AR4) and the models used are ECHAM5 and HadC-N3. While these are excellent models, they are not the same “global” set of models used by AR4 or AR5 though they are a part of the larger set of models included in AR4/AR5 and CMIP3/CMIP5. There is no mention of the RCP4.5 scenarios previously mentioned in this WGII report for other assessment variables. While the conclusions arrived at and/or presented are most likely to be valid, one may raise the question as to the internal consistency of the information products used to carry out the assessment of impact. To be noted, this could be a point of curiosity to the random outside reader. Perhaps a few lines of explanation would help the cases presented. Perhaps it is a matter for the consideration of the IPCC for AR6? (UNITED STATES OF AMERICA)
508	23	18	50	0	52	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
509	23	19	5	0	6	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
510	23	19	5	19	6	This sentence is probably incomplete; please rewrite. (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
511	23	19	6	19	6	in the absence (Pecheux, Martin, Institut des Foraminifères Symbiotiques)
512	23	19	6	19	6	Please clarify this statement as it seems unclear\n\n (NETHERLANDS)
513	23	19	6	19	6	change "latitudes the absence" in "latitudes due to the absence" (Cassardo, Claudio, University of Torino)
514	23	19	8	19	9	Suggestion: add a transition sentence from Ozone pollution to weeds \n\n (NETHERLANDS)
515	23	19	8	19	12	There are also certain Solanaceous weeds (Solanum physalifolium, Solanum nigrum) that are likely to increase especially in Northernmost Europe, not only as a weed but also as a source of inoculum for Phytophthora infestans (e.g. Grönberg et al. 2012. Can Weed Hosts Increase Aggressiveness of Phytophthora infestans on Potato? Phytopathology 102:429-433.) (Hannukkala, Asko, MTT Agrifood Research Finland)
516	23	19	8	19	12	A definition of C3 and C4 plants, as photosynthetic pathways, should be included in order to make this section more robust. The pathways determine the use of CO2 by crops and weeds. (UNITED STATES OF AMERICA)
517	23	19	14	19	30	It should also be added somewhere into this chapter that many bacterial plant diseases especially on potato (Pectobacterium, Dickeya, Ralstonia) will provide much higher risk in warming climate wit higher precipitation (e.g. Hannukkala, A. 2011. Examples of alien pathogens in Finnish potato production - their introduction, establishment and consequences. Agricultural and Food Science 20: 42-61.) (Hannukkala, Asko, MTT Agrifood Research Finland)
518	23	19	18	19	18	change "2009) and some" with "2009). Some" (Cassardo, Claudio, University of Torino)
519	23	19	18	19	19	cereal stem rot (Puccinia striiformis) => rot should be rust, Puccinia striiformis = stripe rust, Puccinia graminis= stem rust (Hannukkala, Asko, MTT Agrifood Research Finland)
520	23	19	22	19	24	Also probable change from spring barley to winter barley will increase dramatically risk for barley powdery mildew (Blumeria graminis) in Nortehermost regions where the pathogen currently cannot overwinter due to lack of winter host (winter barley) Hakala et al. 2011. (Hannukkala, Asko, MTT Agrifood Research Finland)

#	Ch	From Page	From Line	To Page	To Line	Comment
521	23	19	42	20	2	Farmers are also adapting their pesticide use according to increased pest risks. E.g. the sales and application strategies of potato late blight fungicides (Cooke, LE. Et al. 2011 Epidemiology and Integrated Control of Potato Late Blight in Europe. Potato Research 54:183-222) have been affected by increased severity of epidemics caused by Phytophthora infestans. Similar examples can be found also in control of cereal diseases. This tendency in increasing pesticide use is severely conflicting with the new EU Pesticide Regulation (REGULATION (EC) No 1107/2009 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC) to reduce pesticide use in Europe. (Hannukkala, Asko, MTT Agrifood Research Finland)
522	23	19	43	0	0	It is odd to refer to global mean temperature change when discussing impacts in Italy. (Yao, Xiangjun, Food and Agriculture Organization of the United Nations (FAO))
523	23	19	43	19	43	what do you mean with farming system ?\n\n (NETHERLANDS)
524	23	19	48	19	48	transition unclear and not reference: climate change alters breeding targets\n\n (NETHERLANDS)
525	23	20	11	20	12	The text suggests the need to use economic and ecological optimization models at the farm scale. Are these model and decision support systems available at that scale? How are farmers participating in those modeling efforts and/or accessing those results for farm level planning? In addition, the chapter in general lacks narrative in the line of economic implications related to the assessments in this chapter. What are the financial risks? What are the costs of inaction? What are the costs of addressing the various challenges cited in the chapter? (UNITED STATES OF AMERICA)
526	23	20	17	0	0	The first sentence should cross reference chapter 7's livestock discussion. (Yao, Xiangjun, Food and Agriculture Organization of the United Nations (FAO))
527	23	20	17	20	52	Extreme heat events such as the Russian heat wave of 2010 tend to have severe negative impacts on livestock. This should be mentioned in the list of negative climate change impacts. (UNITED STATES OF AMERICA)
528	23	20	19	20	19	a daily mean temperature of 18 degrees C': is this how temperature units will be given? (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
529	23	20	21	20	21	specify where pig production is affected by climate change\n\n (NETHERLANDS)
530	23	20	27	20	27	Please clarify meaning of "amount timing". (UNITED STATES OF AMERICA)
531	23	20	27	20	39	Section heading (Livestock production) do not correspond to this paragraph. I'd suggest naming this section 'Forage and Livestock production' and move this paragraph at the beginning of the section (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
532	23	20	41	20	41	We would include a transition sentence here from forage failure to disease in livestock production\n\n (NETHERLANDS)
533	23	20	41	20	52	Any reference to false warnings. As the case of avian influenza showed, they may have a strong impact on animal production and economies (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
534	23	20	43	20	43	If "unlikely" is being used as calibrated uncertainty language, reflecting a probabilistic basis for its assignment, it should be italicized. Casual usage of the reserved likelihood term should be avoided. (Mach, Katharine, IPCC WGII TSU)
535	23	20	44	20	45	In the sentence "Ticks, the primary arthropod vectors of zoonotic diseases in Europe, have likely changed distributions with climate warming" it is hard to access what exactly is the impact and if this is a good or bad thing. Please clarify. (UNITED STATES OF AMERICA)
536	23	20	45	20	46	specify the changing distributions + exchange comma with a point after (23.5)\n\n (NETHERLANDS)
537	23	20	47	20	47	project should be "projected" (UNITED STATES OF AMERICA)
538	23	20	47	20	47	project --> projected (Cassardo, Claudio, University of Torino)

#	Ch	From Page	From Line	To Page	To Line	Comment
539	23	21	1	0	0	In Sections 23.4.3 and 23.4.4 I found no mention to the interaction between changes in soil moisture availability (particularly drying in southern Europe) and other abiotic factors as salinity and heavy metal pollution. There is evidence that effects of soluble salts and heavy metals depend on soil moisture content. (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
540	23	21	1	21	2	some citations would be probably needed to support this sentence (after "declining water quality")\n\n (NETHERLANDS)
541	23	21	3	21	3	move "confirm" after the reference.(Aristeidis Koutroulis, Water Resources Management & Coastal Engineering Laboratory, Technical University of Crete, Greece) (GREECE)
542	23	21	21	0	22	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
543	23	21	21	21	21	change "projected increase" to "is projected to increase" (Aristeidis Koutroulis, Water Resources Management & Coastal Engineering Laboratory, Technical University of Crete, Greece) (GREECE)
544	23	21	23	21	38	There is useful paper by Moriondo et al (2010) which shows that when modelling the impact on European agriculture of a 2oC increase in temperature, irrigation as adaptation option was more beneficial in southern Europe . In Mitig Adapt Strateg Glob Change (2010) 15:657–679 (Berry, Pam, Oxford)
545	23	21	29	21	29	why does climate change induce a decline in groundwater recharge? (Lobell, David, Stanford University)
546	23	21	34	21	34	why would climate change cause irrigation system failure? (Lobell, David, Stanford University)
547	23	21	40	21	40	Please insert reference for the increased water supply and flooding hazards over northern Europe statement. (UNITED STATES OF AMERICA)
548	23	21	40	21	53	There are a number of ideas here but each sentence seems to deal with a different one and they need crafting in to a coherent arguments (Berry, Pam, Oxford)
549	23	21	43	21	43	After (Falloon and Betts, 2010). It could be added the following "Recently observed trends and projections for the Mediterranean region (Ludwig et al., 2011) from climate model ensembles indicate a strong susceptibility to change in hydrological regimes, an increasing general shortage of water resources and consequent threats to water availability and management. These projections enhance the necessity for more robust water management, pricing and recycling policies, in order to secure adequate future water supply and prevent tensions among users (García et al., 2011)."\nLudwig R, Roson, R., Zografos, C., Kallis, G., 2011. Towards an inter-disciplinary research agenda on climate change, water and security in Southern Europe and neighboring countries, Environmental Science & Policy, 14 (7) 794-803.\nGarcía-Ruiz, J.M., López-Moreno, J.I., Vicente-Serrano, S.M., Lasanta-Martínez, T., Beguería, S., 2011. Mediterranean water resources in a global change scenario, Earth-Science Reviews, 105 (3-4), 121-139. (Aristeidis Koutroulis, Department of Environmental Engineering, Technical University of Crete, Greece) (GREECE)
550	23	22	11	0	0	Section 23.4.4. In developing the final draft of the chapter, this section should be shortened as much as possible. (Mach, Katharine, IPCC WGII TSU)
551	23	22	11	24	3	The forestry section seems to contain a mix of material on trees in general (many of which are not of commercial importance) and then material which refers implicitly or explicitly with issues associated with forestry (i.e. deliberate management of trees). This whole section (23.4.4) needs clarification. (Berry, Pam, Oxford)
552	23	22	17	0	17	It should be forest populations (not forests) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
553	23	22	17	22	17	Once again no specific quantitative information is given on forests. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
554	23	22	24	22	26	Increased European-wide forest productivity had been described in Schröter, D. et al. (2005). Ecosystem Service Supply and Vulnerability to Global Change in Europe. Science 310: 1333 (CORTINA, JORDI, UNIVERSITY OF ALICANTE)

#	Ch	From Page	From Line	To Page	To Line	Comment
555	23	22	28	22	35	Changes in climate may reduce the success of natural regeneration and hence require adjustments to silvicultural practices. Special attention is required for endangered species such as Spanish black pine (<i>Pinus nigra</i> Arn. ssp <i>salzmannii</i>) in Spain because of impediments to achieve successful natural regeneration (Lucas-Borja et al. 2011). REFERENCE: Lucas-Borja, M.E., T.F Fonseca, P. Silva-Santos, 2011. Natural regeneration of <i>Pinus nigra</i> Arn spp <i>salzmannii</i> forest in Cuenca Mountains (Spain): a problem for sustainable forest management. In: Forestry: Research, Practice and Policies. Editor: Diane A. Boehm. Environmental Science, Engineering and Technology, Nova Science Publishers, New York. ISBN: 978-1-61209-824-1 (Fidalgo Fonseca, Teresa, Universidade de Trás-os-Montes e Alto Douro)
556	23	22	31	22	31	The word continental is misspelt. (Fidalgo Fonseca, Teresa, Universidade de Trás-os-Montes e Alto Douro)
557	23	22	38	0	0	Shifts in forest tree species range due to climate change have been reported (Peñuelas and Boada 2003, Peñuelas et al 2007). PEÑUELAS J., OGAYA R., BOADA M., JUMP A. 2007. Migration, invasion and decline: changes in recruitment and forest structure in a warming-linked shift of European beech forest in Catalonia. <i>Ecography</i> 30: 829-838. PEÑUELAS J., BOADA M. 2003 A global change-induced biome shift in the Montseny mountains (NE Spain). <i>Global change Biology</i> 9(2): 131-140. (Penuelas, Josep, CREAF-CSIC)
558	23	22	40	0	0	Feehan et al is only a review and thus the original paper(s) should be cited - not that I have anything against the paper but the original authors should get the credit. (Berry, Pam, Oxford)
559	23	22	42	22	42	Shift in tree species composition may be favoured by dieback of dominant species (Galiano, L., Martínez-Vilalta, J. and Lloret, F. (2010). Drought-Induced Multifactor Decline of Scots Pine in the Pyrenees and Potential Vegetation Change by the Expansion of Co-occurring Oak Species. <i>Ecosystems</i> 13: 978-991). (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
560	23	22	42	22	45	Explain further the estimates of reduction of economic value of European forest land by 14-50%. What is in the base of the large range? Different scenarios? (UNITED STATES OF AMERICA)
561	23	22	47	23	4	Sub-section "Fire and storm damage". Consider including the following references: "Pausas, J. G. and Ribeiro, E. (2013), The global fire–productivity relationship. <i>Global Ecology and Biogeography</i> , 22: 728–736. doi: 10.1111/geb.12043" and "Pausas, J. G. and Paula, S. (2012), Fuel shapes the fire–climate relationship: evidence from Mediterranean ecosystems. <i>Global Ecology and Biogeography</i> , 21: 1074–1082. doi: 10.1111/j.1466-8238.2012.00769.x" (Moreira, Bruno, Centre for Functional Ecology - University of Coimbra)
562	23	22	48	22	48	Recent studies show a different pattern: non-significant trend in the number of fires since 1986 in Mediterranean Europe, and significant decrease in the last decade. Also a significant decrease in area burnt over the whole period. Jesús San-Miguel-Ayán, Marcos Rodrigues, Sandra Santos de Oliveira, Claudia Kemper Pacheco, Francisco Moreira, Beatriz Duguy and Andrea Camia (2012). Land Cover Change and Fire Regime in the European Mediterranean Region. Chapter 2 in F. Moreira et al. (eds.), <i>Post-Fire Management and Restoration of Southern European Forests</i> , Managing Forest Ecosystems 24, Elsevier. DOI 10.1007/978-94-007-2208-8_2 (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
563	23	22	48	22	49	but see Turco et al (2013). "Turco, M., Llasat, M. C., Tudela, A., Castro, X., and Provenza, A.: Brief communication Decreasing fires in a Mediterranean region (1970–2010, NE Spain), <i>Nat. Hazards Earth Syst. Sci.</i> , 13, 649-652, doi:10.5194/nhess-13-649-2013" (Moreira, Bruno, Centre for Functional Ecology - University of Coimbra)

#	Ch	From Page	From Line	To Page	To Line	Comment
564	23	22	48	23	4	I have sent some comments to the first version of this WGII-AR5 that I am afraid have not been considered here. In effect, recent papers have showed that in spite that climate change seems to point to an increase of forest fires, other factors like changes in biomassa or management and adaptation strategies, can alter this expected result. Recent studies (Turco et al. 2013a and Turco et al. 2013b) show that both the burned area (BA) and number of fires (NF) series display a decreasing trend in a Mediterranean environment and suggest that the often-reported (see e.g. IPCC 2007, and references therein) increase in the number of fires in last decades in Mediterranean regions, could be at least partially caused by improved detection rather than by an actual increase in fire occurrence \nInterestingly, the recently published EEA (2012) report indicates that "the number of fires in the Mediterranean region has increased over the period from 1980 to 2000; it has decreased thereafter". While this study represents a valuable resource for climate change impacts in Europe, no homogeneity analysis was performed on fires data, suggesting the possibility of a mixing of actual trends with a growing (and probably stable in the last years) fire detection ability. On the other hand Turco et al (2013a, b) show a decrease in the number of forest fires in the NE of the Iberian Peninsula, since 1970 and it shows an exemple about how good practices and mitigation/adaptation strategies can diminish natural risks. Besides this, a major evaporation and less water resources can also affect the vegetation and diminish the combustible availability. References. Turco, M., M.C. Llasat, J. von Hardenberg, A. Provenzale, 2013a. Impact of climate variability on summer fires in a Mediterranean Environment (Northeastern Iberian Peninsula). Climatic Change, vol. 16, 3, 665-678. DOI 10.1007/s19584-012-0505-6. Turco, M., M. C. Llasat, A. Tudela, X. Castro, and A. Provenzale, 2013b. Decreasing fires in a Mediterranean region (1970–2010, NE Spain). Nat. Hazards Earth Syst. Sci., 13, 649–652, 2013. www.nat-hazards-earth-syst-sci.net/13/649/2013/ doi:10.5194/nhess-13-649-2013; EEA: Climate change, impacts and vulnerability in Europe 2012 - An indicator-based report, Tech. Rep. 12, European Environment Agency, Copenhagen, Denmark, http://www.eea.europa.eu/publications/climate-impacts-and-vulnerability-2012, 2012. (Llasat, Maria-Carmen, University of Barcelona)
565	23	22	48	23	4	forest fires sometimes are also caused by the human stupidity, especially in some nations like mine (Italy), in which every summertime there are several hectares burned (Cassardo, Claudio, University of Torino)
566	23	22	51	22	52	The relevant time frame for this statement could be clarified further. (Mach, Katharine, IPCC WGII TSU)
567	23	23	3	23	4	Correct reference brackets. (Costas Balaras, Institute for Environmental Research and Sustainable Development, National Observatory of Athens, Greece) (GREECE)
568	23	23	18	23	25	Severe windstorm damages are also reported for Southern Europe (European Forest Institute, EFIATLANTIC FORESTORMS database, http://www.efiatlantic.efi.int/portal/databases/forestorms/). For North Portugal (Fonseca, 2004), losses from wind damages are expected to occur 6 years per decade. Probability of mortality in pine forests is directly related to stand density and management practices, evidencing that management could be used as adaptive measure. REFERENCE: Fonseca, T.F., 2004. Modelação do crescimento, mortalidade e distribuição diamétrica, do pinhal bravo no Vale do Tâmega. PhD Thesis. University of Trás-os-Montes e Alto Douro, Vila Real, Portugal, 248 pp. (Fidalgo Fonseca, Teresa, Universidade de Trás-os-Montes e Alto Douro)
569	23	23	19	0	21	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
570	23	23	23	0	25	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)

#	Ch	From Page	From Line	To Page	To Line	Comment
571	23	23	23	23	23	Are storm losses from the A1B scenario 19%, but 8% from B2? The text implies the losses are the other way round. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
572	23	23	32	23	33	survival of a greater number of individuals here refers to people presumably? Not pests? (UNITED STATES OF AMERICA)
573	23	23	35	0	37	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
574	23	23	39	23	41	Please revisit the syntax of the sentence "Spruce bark beetle will be able to initiate...". (UNITED STATES OF AMERICA)
575	23	23	44	24	3	Sub-section "Forest management and land use" Short-term and long-term strategies in forest management to enhance ecosystem resistance and resilience do not consider fires (Moreira, Bruno, Centre for Functional Ecology - University of Coimbra)
576	23	23	44	24	3	You may want to have a look at Bolte, A., C. Ammer, M. Lof, P. Madsen, G. J. Nabuurs, P. Schall, P. Spathelf and J. Rock (2009). "Adaptive forest management in central Europe: Climate change impacts, strategies and integrative concept." Scandinavian Journal Of Forest Research 24(6): 473-482 for a concise overview on forest management options in regard to CC in Europe.\n (Rock, Joachim, Johann Heinrich von Thuenen-Institute, Federal Research Institute for Rural Areas, Forestry and Fisheries)
577	23	23	45	0	46	Please explain why these factors would strongly reduce accessibility (e.g. by turning areas into swamps). (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
578	23	23	45	23	45	Why does thawing permafrost limit accessing forests? (UNITED STATES OF AMERICA)
579	23	23	51	23	53	Although this statement may be right, the reference supporting it (Giuggiola et al., 2010) is weak. In this short review the lack of consistent information on the interaction between shrubs and trees (and the potential outcomes of shrub removal) is emphasized. (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
580	23	24	0	0	0	Section 23.4.6. What's there is generally informative and well-written. However, the section is strongly imbalanced. In particular the geographical inbalance is serious since it leads to general statements that in reality only apply to some of the seas bordering Europe. The richest fish stocks in the European region, inhabiting the Norwegian and Barents Seas, are not mentioned at all. Several of the stocks in these cold-water seas are expected to increase their habitat and likely their abundance within the IPCC climate scenarios. The huge (mainly salmon) aquaculture of Norway is not mentioned. Again, the consequences of climate change are not all negative. The areas best suited for salmon aquaculture are likely shifted northwards along the Norwegian coast with rising sea temperatures, but there's no reason to assume a decrease in overall productivity. (Ottersen, Geir, Institute of Marine Research)
581	23	24	9	0	11	Miscanthus should be in italics (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
582	23	24	9	24	9	Miscanthus should be in italics (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
583	23	24	10	24	16	The relevant climate/socio-economic scenarios for these projections could be clarified. (Mach, Katharine, IPCC WGII TSU)
584	23	24	11	24	11	Miscanthus should be in italics (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
585	23	24	11	24	25	it seems to me there is a partial contradiction between the sentence ending at line 18 and the following one (Cassardo, Claudio, University of Torino)
586	23	24	20	24	20	typo: "C3(Salicacee" --> "C3 (Salicacee" (Cassardo, Claudio, University of Torino)

#	Ch	From Page	From Line	To Page	To Line	Comment
587	23	24	26	0	28	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
588	23	24	26	24	28	Due to the technics applied and machinery used in SRC it is "very unlikely" that they will replace existing forests in Central and Northern Europe, at least not to a significant amount. The respective sites are just not suited to be driven on by the farming equipment used in SRC harvesting. They should be considered as an alternative land-use on agricultural lands. What can reduce soil C stocks etc. is a reduction in production times (rotation length) in existing forests, though. But this would be SRF, not SRC. (Rock, Joachim, Johann Heinrich von Thuenen-Institute, Federal Research Institute for Rural Areas, Forestry and Fisheries)
589	23	24	31	25	41	Reading through the section on Fisheries and Aquaculture is like reading a series of random thoughts. It would be very helpful to have for the reader an introductory paragraph introducing the topic. It could start by saying, "European Fisheries are likely to be affected in the following ways..." Then it would be right to provide the examples. This is the sort of problem that is characteristic of the whole chapter. which is not very readable. (UNITED STATES OF AMERICA)
590	23	24	35	24	35	23.4.6.: you may wish to cite ch6 here which has a North Atlantic example and a figure on the respective patterns. (Menzel, Lena, Alfred Wegener Institute for Polar and Marine Research)
591	23	24	37	24	39	in the ES it reads "low confidence". \nch6 p 30 L 44 reads "medium evidence", \nch6 p 51 L 4 "very high confidence" ("paralleled by shifts in seasonal activity, species abundance, migration, and body size (6.3.2., very high confidence)")\n (Menzel, Lena, Alfred Wegener Institute for Polar and Marine Research)
592	23	24	38	24	38	Sentence should read "in response to climate change and intensive fishing in aquatic systems". (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
593	23	24	44	24	49	These individual examples could be backed by referring to the general principles discussed in chapter 6. (Menzel, Lena, Alfred Wegener Institute for Polar and Marine Research)
594	23	24	45	24	45	I'm not sure that any quantitative "projections" were provided in this paper, only suggestions. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
595	23	24	47	24	47	If "likely" is being used as calibrated uncertainty language, reflecting a probabilistic basis for its assignment, it should be italicized. Casual usage of the reserved likelihood term should be avoided. (Mach, Katharine, IPCC WGII TSU)
596	23	24	51	25	3	ditto: These individual examples could be backed by referring to the general principles discussed in chapter 6 (Menzel, Lena, Alfred Wegener Institute for Polar and Marine Research)
597	23	24	52	24	53	The text says "Over the past decade, the cod stock has not been restored from its previous collapse (Mieszkowska et al., 2009, ICES, 2012)". As a general statement or reference this highly misleading but judging from the references and the following sentence it is probably intended to refer to cod in the North Sea. If that is the case, then the sentence should be changed to indicate that it only applies to the status of North Sea cod, otherwise it will be taken as referring to all cod stocks. There are more than 10 stocks of cod in the North East Atlantic and their status is very variable. Therefore to talk about cod as there is one stock in the North Atlantic is not correct. In both the Barents Sea and Icelandic waters cod stocks (both spawning and fishable) have been increasing during past decade or so. In fact in the Barents Sea the spawning stock is now at a historical recorded high and the fishable stock at size comparable to the 1950s. See e.g. Report of the Arctic Fisheries Working Group 2012 (AFWG), 20 - 26 April 2012, ICES Headquarters, Copenhagen. ICES CM 2012/ACOM:05. (ICELAND)
598	23	24	52	24	53	Which cod stock? The cited paper covers Atlantic cod in general. The sentence applies to the North Sea cod and most of the US and Canadian stocks, but certainly not the Barents Sea stock. Easiest fix is to move this sentence to after the following one. (Ottersen, Geir, Institute of Marine Research)

#	Ch	From Page	From Line	To Page	To Line	Comment
599	23	24	52	24	53	This sentence ("has not been restored from its previous collapse") is now out of date as there has been a significant increase in cod numbers in recent years, perhaps as a result of several cold winters. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
600	23	25	3	25	3	Also see Engelhard et al. 2011 [ICES J. Mar. Sci. (2011) 68 (3): 580-591.] that has demonstrated patterns in boreal vs. Lusitanian species in the North Sea. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
601	23	25	8	0	8	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
602	23	25	8	25	9	ditto: These individual examples could be backed by referring to the general principles discussed in chapter 6 (Menzel, Lena, Alfred Wegener Institute for Polar and Marine Research)
603	23	25	11	25	16	see the sections on HABs and spreading pathogens in chapter 6 (Menzel, Lena, Alfred Wegener Institute for Polar and Marine Research)
604	23	25	25	25	26	This does not match the Executive summary (Menzel, Lena, Alfred Wegener Institute for Polar and Marine Research)
605	23	25	30	25	33	We recommend to revise SWD (2013) 133 - Climate change adaptation, coastal and marine issues (http://ec.europa.eu/clima/policies/adaptation/what/docs/swd_2013_133_en.pdf) for dealing with fisheries management and planning in EU under climate change (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
606	23	25	30	25	33	See the Cheung et al paper [Aquatic Conservation 22(3): 368-388, 2012] that includes useful narrative on changes in the effectiveness of European fishery MPAs that might be included here. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
607	23	25	35	0	35	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
608	23	25	35	25	41	A better description of the mackerel dispute and similar European territorial disagreements is included in the Cheung et al paper [Aquatic Conservation 22(3): 368-388, 2012] (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
609	23	25	44	0	0	Most specifically, this is referring to human health, in particular PUBLIC HEALTH, being the preferred term. (UNITED STATES OF AMERICA)
610	23	25	48	25	48	Casual usage of "likely" should be avoided, as it is a reserved likelihood term. (Mach, Katharine, IPCC WGII TSU)
611	23	25	48	26	6	Here the results from PHEWE on heat effects can be mentioned. An important issue not taken up in the section, which should be added is the fact that temperature effects on mortality and morbidity depend on the usual climate in an area, i.e. populations adapt to the usual climatic conditions. This is shown in Baccini et al 2008. (Klea Katsouyanni, Hygiene, Epidemiology and Medical Statistics, University of Athens Medical School. Greece) (GREECE)

#	Ch	From Page	From Line	To Page	To Line	Comment
612	23	25	48	27	19	In Europe two large multi-centre projects addressing the issues of health effects from meteorological factors and heat waves have been implemented and resulted in significant publications. They are 1. the PHEWE project (funded by DG Research) with key papers: Michelozzi P, Accetta G, De Sario M, et al. High temperature and hospitalizations for cardiovascular and respiratory causes in 12 European cities. Am J Respir Crit Care Med 2009; 179: 383-389 ; Baccini M, Biggeri A, Accetta G et al. Heat effects on Mortality in 15 European cities. Epidemiology 2008; 19:711-719; Analitis A, Katsouyanni K, Biggeri A, Baccini M et al. Effects of Cold Weather on Mortality: Results from 15 European Cities within the PHEWE Project. Am J Epidemiol 2008; 168:1397-408. and 2. the EuroHEAT project (funded by DG SANCO) with key papers D'Ippoliti D, Michelozzi P, Marino C et al. The impact of heat waves on mortality in 9 European cities: results from the EuroHEAT project. Environ Health. 2010; 9: pp.37; Analitis A, Michelozzi P, D' Ippoliti D et al. Effects of Heat Waves on Mortality. Effect Modification and Confounding by Air Pollutants. Epidemiology. 2013; in press. These two projects should be quoted and reference made to their significant results (Klea Katsouyanni, Hygiene, Epidemiology and Medical Statistics, University of Athens Medical School, Greece)\n (GREECE)
613	23	25	48	27	19	There are important health effects of forest fires both through PM increase and others. Relevant publication for Europe: Analitis A, Georgiadis I, Katsouyanni K. Forest fires are associated with elevated mortality in a dense urban setting. Occup Environ Med. 2012; 69(3):158-62. (Klea Katsouyanni, Hygiene, Epidemiology and Medical Statistics, University of Athens Medical School, Greece) (GREECE)
614	23	25	52	0	0	1) the paper of Corobov et al was published in 2012 (remove in press); 2) to add a second relevant paper of these authors: Corobov R., S. Sheridan, K. Ebi, N. Opopol, 2013: Warm season temperature-mortality relationships in Chisinau (Moldova), International Journal of Atmospheric Sciences, http://dx.doi.org/10.1155/2013/346024 . (Trombitsky, Ilya, Eco-TIRAS International Environmental Association of River Keepers)
615	23	25	52	0	0	The reference Corobov 2011 should be corrected since it has been published; need to also complete the title and is also missing one coauthor. (Costas Balaras, Institute for Environmental Research and Sustainable Development, National Observatory of Athens, Greece) (GREECE)
616	23	25	52	0	0	Corobov et al. 2011 refers to Moldova, not southern Europe: move the citation to the end of the previous sentence. (Parker, David, Met Office Hadley Centre)
617	23	25	53	25	53	it is not only a matter of heat. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
618	23	25	53	26	1	It is stated: "However, elderly populations in central... and northern Europe... are also vulnerable to heat wave events." Although the elderly are indeed more vulnerable to heat waves, there is evidence of increased daily mortality risk for all age groups at high temperatures in UK regions (Reference: Vardoulakis and Heaviside, 2012). (Vardoulakis, Sotiris, Health Protection Agency)
619	23	26	1	26	2	suggest to include also (a selection of) the references: Matthies F, Bickler G, Cardenosa Marin N, Hales S (eds.). 2008. Heat-health action plans: guidance. World Health Organization Regional Office for Europe. Copenhagen, Denmark (available at http://www.euro.who.int/__data/assets/pdf_file/0006/95919/E91347.pdf ; WHO (2009). EuroHEAT: Improving public health responses to extreme weather events /heat-waves; Technical summary.WHO Regional Office for Europe, Copenhagen. (available at: http://www.euro.who.int/__data/assets/pdf_file/0010/95914/E92474.pdf .; Hajat, S., O'Connor, M., Kosatsky, T. (2010) Health effects of hot weather: from awareness of risk factors to effective health protection, The Lancet, 375: 856-63; Lowe D, Ebi KL, Forsberg B. Heatwave early warning systems and adaptation advice to reduce human health consequences of heatwaves. Int J Environ Res Public Health. 2011;8(12):4623-4648; They identify and describe core elements of heat plans and public health measures; (Matthies, Eva Freericks-Consultant)
620	23	26	4	0	0	The use of the term "cool rooms" is not technically correct. Could it be that it refers to cool roofs ? (Costas Balaras, Institute for Environmental Research and Sustainable Development, National Observatory of Athens, Greece) (GREECE)

#	Ch	From Page	From Line	To Page	To Line	Comment
621	23	26	8	0	0	Discussion on the thermal environment (including thermal stress and thermal comfort) in European cities or regions should be provided taken that it influences energy consumption, air quality and human health and also reflects a valuable parameter in adaption/mitigation plans. (Constantinos Cartalis, Environmental Physics, University of Athens, Greece) (GREECE)
622	23	26	8	26	17	Here the results from the EuroHEAT project should be mentioned on the effects of heat waves on mortality and admissions. An important issue taken up in Analitis et al is the evidence for interaction among heat and air pollution on health effects. (Klea Katsouyanni, Hygiene, Epidemiology and Medical Statistics, University of Athens Medical School, Greece) (GREECE)
623	23	26	8	26	17	The issue of the synergistic effects between air pollution and heat, taken up by Analitis et al 2013 should be mentioned. (Klea Katsouyanni, Hygiene, Epidemiology and Medical Statistics, University of Athens Medical School, Greece) (GREECE)
624	23	26	9	26	9	typo: morbidity --> morbidity (Cassardo, Claudio, University of Torino)
625	23	26	20	26	24	"During the last decade, in the European Region, 1000 persons are reported to have been killed by floods and more than 3.4 million affected. A review of European data for the years 2000–2011 shows that the number of deaths from flooding was highest in central Europe and the former Soviet Republics. " Reference: Menne B, Murray V (eds). 2013. Floods in the WHO European region: health effects and their prevention. WHO Regional Office for Europe, Copenhagen, Denmark " (Kendrovski, Vladimir, World Health Organization Regional Office for Europe)
626	23	26	22	26	23	The UK Health Protection Authority published a report in Dec 2011 " The Effects of Flooding on Mental Health". This suggest that there are issues associated with flooding and mental health. This should be reviewed. (Viner, David, Private)
627	23	26	25	0	0	Please add a paragraph at this point referring to recent increases of pollen levels in the air and impacts on human health like the following: Analysing a continental-scale pollen data set, Ziello et al. (2012) showed an increasing trend in the yearly amount of airborne pollen for many plant taxa in Europe, which they attributed to the anthropogenic rise of atmospheric CO2 levels. Experimental enhancements of CO2 have demonstrated increases in the pollen amount (Ziska and Caulfield 2000) and in allergenicity (Singer et al. 2005), as for common ragweed. A greater exposure of humans to pollen allergens may have serious consequences for public health as it may affect the incidence and prevalence of allergic diseases, such as allergic rhinitis (common hay fever) and asthma. Citations for the above are the following: Ziska L.H. and F.A. Caulfield, 2000: Rising CO2 and pollen production of common ragweed (<i>Ambrosia artemisiifolia</i>), a known allergy-inducing species: Implications for public health. Australian Journal of Plant Physiology, 27, 893-898. / Singer B.D., L.H. Ziska, D.A. Frenz, D.E. Gebhard and J.G Straka, 2005: Increasing Amb a 1 content in common ragweed (<i>Ambrosia artemisiifolia</i>) pollen as a function of rising atmospheric CO2 concentration. Functional Plant Biology, 32, 667-670 / Ziello C., T.H. Sparks, N. Estrella, J. Belmonte, K.C. Bergmann, E. Bucher, M.A. Brighetti, A. Damialis, M. Detandt, C. Galán, R. Gehrig, P. Grewling, A.M. Gutiérrez Bustillo, M. Hallsdóttir, M.-C. Kockhans-Bieda, C. De Linares, D. Myszkowska, A. Páldy, A. Sánchez, M. Smith, M. Thibaudon, A. Travaglini, A. Uruska, R.M. Valencia-Barrera, D. Vokou, R. Wachter, L.A. de Weger, and A. Menzel, 2012: Changes to airborne pollen counts across Europe. PLOS One 7, e34076. (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)

#	Ch	From Page	From Line	To Page	To Line	Comment
628	23	26	25	26	36	Usually, in Europe <i>Aedes albopictus</i> (present in wide parts of Europe) is considered a "competent" vector. (not important, because so far there have been only few cases (Madeira) of transmission). WHO is assessing the situation and the risk of dengue in Europe differently. Also ECDC stated in the conclusions of the report "the climatic suitability for dengue transmission in continental Europe" that we need research exploring what would happen "if additional instances of dengue transmitted by <i>Aedes albopictus</i> occurred in Europe". I cite here from an information sheet under development which reviewed recent literature and consulted experts: " <i>Aedes albopictus</i> is reported as widely established and spreading in the western Mediterranean basin, from Spain to Greece, but was only recently found in more eastern countries and around the Black Sea coast (Turkey, Bulgaria, southern Russia). Incursions have been reported in more northern countries, but no establishment has been confirmed to date. <i>Aedes aegypti</i> used to be widespread in southern Europe in the past, seemingly disappeared, but re-introductions are occurring currently. This can be due to many reasons but also supported by a changing climate. <i>Aedes albopictus</i> and <i>Aedes aegypti</i> mosquitoes are effective vectors of the potentially severe diseases such as dengue and chikungunya fever. Travellers (migrant workers, tourists) returning from disease-endemic countries are increasingly introducing dengue, chikungunya viruses and in rare cases yellow fever virus into the European Region. In areas where these invasive mosquitoes have been established or re-established, there is a genuine risk of local transmission of these diseases. The threat of dengue fever in Europe has increased in recent years. The recent locally-transmitted dengue cases have shown that dengue transmission is possible in different areas of continental Europe where <i>Aedes albopictus</i> or <i>Aedes aegypti</i> are present. The outbreak in Madeira has led to reports of the spread of cases into 14 other European countries. The complex pathways and interactions between climate, ecosystem, vector, virus and humans and socio-environmental changes are only partially understood and difficult to model. However, the re-emergence of <i>Aedes aegypti</i> as dengue transmitting mosquito and the wide presence of <i>Aedes albopictus</i> as potential vector in parts of the European Region and the lack of vaccine or treatment make preventive measures highly recommendable regardless of the role of climate change." (Wolf, Tanja, WHO Regional Office for Europe)
629	23	26	29	26	30	the same sources detect improved climatic conditions over northeastern European countries and the Balkans (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
630	23	26	32	26	32	" Section: (dengue vector that is not present in Europe) to be deleted Comment: <i>Ae. aegypti</i> was found once in Italy (1972) as well as in the Netherlands (2010) and sporadically reported from Turkey. The species has been introduced and has established in Madeira, and it has returned to the northern Black Sea coast (Russia, Abkhazia); Reference: Brown JE, Scholte E-J, Dik M, Den Hartog W, Beeuwkes J, Powell JR. <i>Aedes aegypti</i> mosquitoes imported into the Netherlands, 2010. <i>Emerg Infect Dis.</i> 2011; 17(12): 2335-7. Callot J, Delécolle J-C. Notes d'entomologie. - VI) Localisation septentrionale d' <i>Aedes aegypti</i> . <i>Ann Par Hum Comp.</i> 1972: 665. Schaffner F, Van Bortel W. Current status of invasive mosquitoes in Europe. <i>VBORNET Newsletter.</i> 2010; (2): 6-8. Almeida APG, Goncalves YM, Novo MT, Sousa CA, Melim M, Gracio AJ. Vector monitoring of <i>Aedes aegypti</i> in the Autonomous Region of Madeira, Portugal. <i>Euro Surveill.</i> 2007; 12(11): E071115. Yunicheva YU, Ryabova TE, Markovich NY, Bezzhonova OV, Ganushkina LA, Semenov VB, et al. [First data on the presence of breeding populations of the <i>Aedes aegypti</i> L. mosquito in Greater Sochi and various cities of Abkhazia.] <i>Meditinskaja Parazitologija i Parazitarnye Bolezni.</i> 2008; (3): 40-3." (Kendrovski, Vladimir, World Health Organization Regional Office for Europe)
631	23	26	32	26	35	<i>A. aegypti</i> ! (Pecheux, Martin, Institut des Foraminifères Symbiotiques)
632	23	26	34	0	36	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
633	23	26	35	26	35	delete upon the" due to duplication " (Kendrovski, Vladimir, World Health Organization Regional Office for Europe)

#	Ch	From Page	From Line	To Page	To Line	Comment
634	23	26	38	26	47	Leishmaniasis: weird intepretation of Ready. No need to flag ouot the low risk of introduction of exotic species but rather highlight the risk from <i>L. infantum</i> and <i>L. tropica</i> ! (Ready 2010: http://www.eurosurveillance.org/ViewArticle.aspx?Articleid=19505). add a paragraph break before starting on Malaria (Wolf, Tanja, WHO Regional Office for Europe)
635	23	26	39	26	39	Casual usage of "unlikely" should be avoided, as it is a reserved likelihood term. (Mach, Katharine, IPCC WGII TSU)
636	23	26	42	26	42	do not capitalize Aegypti (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
637	23	26	42	26	42	do not capitalize Aegypti (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
638	23	26	42	26	42	Leishmania should be in italics (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
639	23	26	43	26	47	What do the assessments on Malaria conclude?? Only that re-emergence would depend on a series of factors? Last sentence lacks reference. Actually, it might be a good idea to list the factors (add: vectorial competence, importation or dispersal of vectors and reservoir hosts, travel, and climatic/environmental change) in the beginning of the evidence about infectious diseases. here also a link to other chapters (health, other regional chapters?) would fit as the transmission principles are similar in other regions and in some regions data is better than in Europe by now. (Wolf, Tanja, WHO Regional Office for Europe)
640	23	26	53	0	54	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
641	23	26	53	26	53	effects (not "affects"); please check the working here. The note in the bracket on reduction in consumption of animal products is misleading; not the reduction in consumption but the reduction in production of such food would reduce methane emissions. This would better fit in 23.8. as it is about mitigation measures not food safety. If you want to say that consuming less animal products to mitigate climate change helps to improve food safety- then say so (and find a reference). With regard to mycotoxins, the case in Germany in winter 2013 increased awareness. See also http://www.efsa.europa.eu/en/supporting/pub/223e.htm (Wolf, Tanja, WHO Regional Office for Europe)
642	23	26	53	26	53	update the reference with new one: European Food Safety Authority (EFSA) and European Centre for Disease Prevention and Control (ECDC). 2013. The European Union Summary Report on Trends and Sources of Zoonoses, Zoonotic Agents and Food-borne Outbreaks in 2011. EFSA Journal, 11(4):3129." (Kendrovski, Vladimir, World Health Organization Regional Office for Europe)
643	23	27	1	0	3	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
644	23	27	2	0	2	patulin should not be in italics (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
645	23	27	6	0	7	Harmful algal blooms exist both in the sea and in freshwaters and therefore there are both marine and freshwater biotoxins. Hence, they exist in seafood and in that from freshwater. (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
646	23	27	8	27	9	There is little evidence Does this mean that researchers have looked for but found little evidence, or that there is little evidence because the question has not been adequately researched. There is a big distinction between these two possibilities. (UNITED STATES OF AMERICA)
647	23	27	10	0	12	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)

#	Ch	From Page	From Line	To Page	To Line	Comment
648	23	27	14	27	19	Heat-Health watch warning systems are mentioned. But the fact is that these systems have not been evaluated for efficiency compared to the simpler heat warnings and protection plans that have been adopted in other countries. This should be mentioned. It should not be taken for granted that these particular warning systems are by definition an improvement for the prevention of heat wave effects. (Klea Katsouyanni, Hygiene, Epidemiology and Medical Statistics, University of Athens Medical School, Greece) (GREECE)
649	23	27	14	27	19	Well, perhaps you could adjust this statement: the adaptation in the health sector that has been published in relevant journals gives the impression that health adaptation is limited to heat health warning systems. However, at international level the WHO The European Commitment to Act on Environment and Health and The European Regional Framework for Action as well as the amendment of the international health regulation could be considered health adaptation. This includes to 1) integrate health issues in all climate change mitigation and adaptation measures, policies and strategies at all levels and in all sectors. We will assess, prevent and address any adverse health effects of such policies by, for example, strengthening health promotion in environmental policies;\n2) strengthen health, social welfare and environmental systems and services to improve their response to the impacts of climate change in a timely manner, for example to extreme weather events and heat waves. In particular, we will protect the supply of water and the provision of sanitation and safe food through adequate preventive, preparedness and adaptive measures;\n3) develop and strengthen early warning surveillance and preparedness systems for extreme weather events and disease outbreaks, for example vector-borne diseases, at the animal-human-ecosystem interface, where appropriate;\n4) develop and implement educational and public awareness programmes on climate change and health, to encourage healthy, energy-efficient behaviours in all settings and provide information on opportunities for mitigation and adaptation interventions, with a particular focus on vulnerable groups and subregions;\n5) collaborate to increase the health sector's contribution to reducing greenhouse gas emissions and strengthen its leadership on energy- and resource-efficient management and stimulate other sectors, such as the food sector, to do the same;\n6) encourage research and development, for example with tools for forecasting climate impacts on health, identifying health vulnerability and developing appropriate mitigation and adaptation measures.”\n\nThe Regional Framework is based on five strategic objectives, namely: \n1) to ensure that all current and future mitigation and adaptation climate change measures, policies and strategies integrate health issues at all levels; \n2) to strengthen health, social and environmental systems and services to improve their capacity to prevent, prepare for, and cope with climate change; \n3) to raise awareness to encourage healthy mitigation and adaptation policies in all sectors; \n4) to increase the health and environment sectors' contribution to reducing greenhouse gas emissions; \n5) to share best practices, research, data, information, technology and tools at all levels on climate change, environment and health.\n\nAs well WHO guidance on heat and flood protection could be considered health adaptation, as well as national health adaptation plans. http://www.euro.who.int/__data/assets/pdf_file/0006/95919/E91347.pdf and http://reliefweb.int/report/world/floods-who-european-region-health-effects-and-their-prevention (Wolf, Tanja, WHO Regional Office for Europe)
650	23	27	14	27	19	Perhaps existing institutions ALREADY have the needed capabilities, so adaptation is not needed. For example, health departments routinely measure and report on communicable diseases. If these increase due to climate change, the health departments will already be there quantifying them. (UNITED STATES OF AMERICA)
651	23	27	27	0	29	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
652	23	27	29	27	30	provide relevant reference(s) (Costas Balaras, Institute for Environmental Research and Sustainable Development, National Observatory of Athens, Greece) (GREECE)

#	Ch	From Page	From Line	To Page	To Line	Comment
653	23	27	30	27	31	It seems insignificant to me to say about the closure of a road and an airport. The problem of critical infrastructure is not that they close during one event. This section should be focused in my view on passing the message that critical infrastructure should not be located by the coastline. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
654	23	27	35	27	39	It should be additionally mentioned that during heat waves the hospital system is overwhelmed with emergency cases, mainly from heatstroke. Other infrastructure can also be overwhelmed: for example in Athens in the 1987 heat wave (to which only in Athens 2000 extra deaths have been attributed) there was no way to hold the funerals on time. An additional problem has been (both in Athens-1987 and Paris-2003) that physicians were completely unprepared and uneducated to treat heat-strokes, leading to unnecessary losses. (Klea Katsouyanni, Hygiene, Epidemiology and Medical Statistics, University of Athens Medical School, Greece) (GREECE)
655	23	27	35	27	39	Within the EuroHEAT project there has been a review of plans for the prevention of heat wave effects in Europe which may be mentioned. (Klea Katsouyanni, Hygiene, Epidemiology and Medical Statistics, University of Athens Medical School, Greece) (GREECE)
656	23	27	42	0	0	Section 23.5.3 should mention social impacts of CC-driven migrations from areas outside Europe (e.g., Warner, K.; Ehrhart, C.; Sherbinin, A. de; Adamo, S.; Chai-Onn, T. I. (2009). In Search of Shelter. Mapping the Effects of Climate Change on Human Migration and Displacement. UN University, CARE International, Columbia University, the UN Refugee Agency (UNHCR) and World Bank (CORTINA, JORDI. UNIVERSITY OF ALICANTE)
657	23	27	44	27	47	As in a previous place on the same page, there is a statement to the effect that there is "little evidence that." Is this because the topic has been researched and the findings are negative or that the research done has not adequately addressed this. (UNITED STATES OF AMERICA)
658	23	27	45	27	45	Casual usage of "likely" should be avoided, as it is a reserved likelihood term. (Mach, Katharine, IPCC WGII TSU)
659	23	27	49	27	54	Reference should be made to the IPCC report on extremes, (later referred to as "SREX"). Is is not accurate to state that little research has been carried out on the impact of extreme weather events, as each event is often studied and analysed in the aftermath. WMO's Annual State of the Climate is one refence that ties together the various global reports on extreme events' analysis. (UNITED STATES OF AMERICA)
660	23	27	49	28	4	One important point that should be made here is that population density is so high in Europe that in many cases there is development in areas that are particularly flood prone because the "best spots" have already been taken. This amplifies risk. Also, human modification of the landscape in Europe leaves it more vulnerable to extreme events, such as storm related erosion. George Perkins Marsh made this point in his seminal book, "Of Man and Nature" over 150 years ago. (UNITED STATES OF AMERICA)
661	23	27	50	0	0	The use of the term "while their homes are repaired" is not technically correct. Rephrase to "while their homes are refurbished" or "while their homes are renovated" . (Costas Balaras, Institute for Environmental Research and Sustainable Development, National Observatory of Athens, Greece) (GREECE)
662	23	27	50	0	52	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
663	23	27	53	28	1	The social implications of these measures needs to be spelt out e.g. just saying managed retreat is an adaptation option does not contribute to the section. (Berry, Pam, Oxford)
664	23	28	3	28	3	Casual usage of "likely" should be avoided, as it is a reserved likelihood term. (Mach, Katharine, IPCC WGII TSU)
665	23	28	6	0	7	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)

#	Ch	From Page	From Line	To Page	To Line	Comment
666	23	28	12	28	12	Casual usage of "likely" should be avoided, as it is a reserved likelihood term. (Mach, Katharine, IPCC WGII TSU)
667	23	28	18	29	35	The wine issue as well as the cultural heritage issues would fit under tourism and economic impacts (Wolf, Tanja, WHO Regional Office for Europe)
668	23	28	26	28	28	The relevant climate scenario for these projections should be specified. (Mach, Katharine, IPCC WGII TSU)
669	23	28	27	28	28	The difference between Spain and Southern Europe may not be clear (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
670	23	28	35	28	36	Venice now has ... as well as the MOSE system: at present, the MOSE system is not yet active: they are ultimating the works (Cassardo, Claudio, University of Torino)
671	23	28	36	28	37	Apparent disagreement with statement in P. 12, L. 37 (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
672	23	28	39	28	51	You can also include the "polder" landscape of the Netherlands in this short assessment of threatened culturally significant landscapes. [Michel A. Lascaris, Climate Change and the Cultural Heritage of Dikes, V?stis :Journal of the Latvian Academy of Sciences, (2012) 66.3 pgs. 70-77.] There is also an additional level of cultural heritage that doesn't seem to fit into the "built environment" category, urban or rural. Maritime heritage in the form of shipwrecks or other submerged archeological evidence are at risk due to climate change. Climate change is linked to the spread of Teredo navalis (the shipworm) a boring mollusc, in the Rhine/Meuse estuary [Peter Paalvast and Gerard van der Velde "New threats of an old enemy: The distribution of the shipworm Teredo navalis L. (Bivalvia: Teredinidae) related to climate change in the Port of Rotterdam area, the Netherlands," Marine Pollution Bulletin 62.8 (2006) pgs. 1822-1829], and there is already evidence of increased risk to shipwrecks in the Baltic. [Björdal, Charlotte et al. "Strategies for Protection of Wooden Underwater Cultural Heritage in the Baltic Sea Against Marine Borers. The EU Project 'WreckProtect'. Conservation and Management of Archaeological Sites 14.1 (2012): 201-214.]\nThe EU Project 'WreckProtect'" (2012) (Sundberg, Adam, University of Kansas)
673	23	29	5	29	35	This section whilst of interest, needs to be economically quantified, is it actually an important sector or one that covers a particular niche. What is the economic importance of this industry to justify this section and its inclusion. (Viner, David, Private)
674	23	29	22	29	22	"terroir" mixing French with English is a good way to make the text unreadable. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
675	23	29	33	29	33	AOC is more frequently used for French wines than AC (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
676	23	29	40	29	50	Ecosystems and their services are important and there should be some discussion of the table and the references should be included, perhaps as an additional column (Berry, Pam, Oxford)
677	23	30	4	0	16	Please add somewhere in this first paragraph the following: Increased levels of allergenic pollen in the air (Ziello et al., 2012) may also become a serious concern. [The citation is given above, comment for p. 26, l. 25. (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
678	23	30	4	30	27	In the section on air quality it should be clarified that issues related to ways that climate change affects air quality are taken up. The section is poor with reference to additional health effects. There is evidence of synergistic effects of ozone and heat (see EuroHeat papers mentioned above) in Europe. (Klea Katsouyanni, Hygiene, Epidemiology and Medical Statistics, University of Athens Medical School, Greece) (GREECE)
679	23	30	9	30	9	The abbreviation "CTM" is not clear. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
680	23	30	9	30	9	The phrase "climate change per se" should be clarified. (Mach, Katharine, IPCC WGII TSU)
681	23	30	10	30	10	If "likely" is being used as calibrated uncertainty language, reflecting a probabilistic basis for its assignment, it should be italicized. Casual usage of the reserved likelihood term should be avoided. (Mach, Katharine, IPCC WGII TSU)

#	Ch	From Page	From Line	To Page	To Line	Comment
682	23	30	13	0	14	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
683	23	30	13	30	14	Owing to compensating effects of rising temperature and CO2 levels, emissions of some VOCs (isoprene) may not change very much during the 21st century. See paper by Pacifico et al. J. Geophys. Res., 117, D22302, doi:10.1029/2012JD018276\n (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
684	23	30	28	30	29	There is a considerable number of recent relevant studies not mentioned at all for Europe. It should be clearly pointed that recently an increasing number of studies on climate change impacts on air quality has appeared in the literature based on regional models focusing on Europe [e.g., Langner et al., 2005; Szopa et al., 2006; Giorgi and Meleux, 2007; Hedegaard et al., 2008; Krüger et al., 2008; Katragkou et al., 2010; Andersson and Engardt, 2010; Zanis et al., 2011; Katragkou et al., 2011; Huszar et al., 2011; Juda-Rezler et al., 2012].\n\nAndersson, C., and M. Engardt (2010), European ozone in a future climate: Important changes in dry deposition and isoprene emissions, J. Geophys. Res., 115, D02303, doi:10.1029/2008JD011690.\n\nGiorgi, F., and F. Meleux (2007), Modeling the regional effects of climate change on air quality, C. R. Geosci., 339, 721–733, doi:10.1016/j.crte.2007.08.006.\n\nHedegaard, G. B., J. Brandt, J. H. Christensen, L. M. Frohn, C. Geels, K. M. Hansen, and M. Stendel (2008), Impacts of climate change on air pollution levels in the Northern Hemisphere with special focus on Europe and the Arctic, Atmos. Chem. Phys., 8, 3337–3367, doi:10.5194/acp-8-3337-2008.\n\nHuszar P., K. Juda-Rezler, T. Halenka, H. Chervenkov, D. Syrakov, B. C. Krueger, P. Zanis, D. Melas, E. Katragkou, M. Reizer, W. Trapp and M. Belda, Potential climate change impacts on ozone and PM levels over Central and Eastern Europe from high resolution simulations, Climate Research, 50, 51–68, doi: 10.3354/cr01036, 2011.\n\nJuda-Rezler K., M. Reizer, P. Huszar, B.C. Krüger, P. Zanis, D. Syrakov, E. Katragkou, W. Trapp, D. Melas, H. Chervenkov, I. Tegoulis, T. Halenka, On the effect of climate change on regional air quality over central-eastern Europe: concept, evaluation and future projections, Climate Research, 53, 179–203, doi: 10.3354/cr01072, 2012.\n\nKatragkou E., P. Zanis, I. Tegoulis, D. Melas, I. Kioutsioukis, B.C. Krüger, P. Huszar, T. Halenka, S. Rauscher, Decadal regional air quality simulations over Europe in present climate: near surface ozone sensitivity to external meteorological forcing, Atmospheric Chemistry and Physics, 10, 11805–11821, doi:10.5194/acp-10-11805-2010, 2010.\n\nKatragkou E., P. Zanis, I. Kioutsioukis, I. Tegoulis, D. Melas, B.C. Krüger, E. Coppola, Future climate change impacts on surface ozone from regional climate-air quality simulations over Europe, Journal of Geophysical Research, 116, D22307, doi:10.1029/2011JD015899, 2011.\n\nKrüger, B. C., E. Katragkou, I. Tegoulis, P. Zanis, D. Melas, E. Coppola, S. Rauscher, P. Huszar, T. Halenka (2008), Regional photochemical model calculations for Europe concerning ozone levels in a changing climate, Q. J. Hungarian Meteorol. Serv., 112(3–4), 285–300.\n\nLangner, J., R. Bergstrom, and V. Foltescu (2005), Impact of climate change on surface ozone and deposition of sulphur and nitrogen in Europe, Atmos. Environ., 39, 1129–1141, doi:10.1016/j.atmosenv.2004.09.082.\n\nSzopa, S., D. A. Hauglustaine, R. Vautard, and L. Menut (2006), Future global tropospheric ozone changes and impact on European air quality, Geophys. Res. Lett., 33, L14805, doi:10.1029/2006GL025860.\n\nZanis P., E. Katragkou, I. Tegoulis, A. Poupkou, D. Melas, P. Huszar, F. Giorgi, Evaluation of near surface ozone in air quality simulations forced by a regional climate model over Europe for the period 1991-2000, Atmospheric Environment, 45, 6489-6500, doi:10.1016/j.atmosenv.2011.09, 2011. \n(Prodromos Zanis, Department of Meteorology and Climatology, School of Geology, Aristotle University of Thessaloniki, Greece) (GREECE)
685	23	30	30	0	0	Desertification is not dealt with in the whole chapter (except as non-climatic trends). Desertificatoin and soil degradation, linked to fires, salinization, water stress, etc. could significantly change in Europe, affecting economy and ecosystem goods and services. This should be captured in the chapter. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)

#	Ch	From Page	From Line	To Page	To Line	Comment
686	23	30	39	30	41	It is not clear the area where this statement applies. (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
687	23	30	41	0	43	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
688	23	30	46	0	48	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
689	23	30	48	30	51	The relevant climate scenario for this projection should be specified. (Mach, Katharine, IPCC WGII TSU)
690	23	30	53	31	3	The relevant climate scenario for this projection should be specified. (Mach, Katharine, IPCC WGII TSU)
691	23	31	3	0	3	Nobody is expected to remember which counties made EU25. So, please give the names of the EU countries that did not make part of EU25. (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
692	23	31	5	0	5	Delete J from Smith J. et (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
693	23	31	12	31	15	Conservation agriculture can also contribute to climate mitigation through reductions in energy usage. Khaledian et al. (2010) calculated that direct seeding into mulch for corn and sorghum crops in France reduced energy inputs significantly (as much as 18%) whilst conserving farm output (Berry, Pam, Oxford)
694	23	31	19	0	22	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
695	23	31	29	31	31	The heat capacity of water is the same whether the water body is shallow or deep, thus it is irrelevant here. Shallow water is more vulnerable to heating because the volume of water is less, and the solar insolation or surficial heat transfer per square meter is more per unit volume than in deep water. Also, make the comparison to deep water explicit. (UNITED STATES OF AMERICA)
696	23	31	34	0	0	I propose to add after (Boxall et al. 2009): An analysis of water quality changes caused by extreme weather events in the European Region was made in Sinisi and Aertgeerts (2010): Sinisi, L. and R. Aertgeerts (eds.), 2010, Guidance on Water Supply and Sanitation in Extreme Weather Events, WHO Regional Office for Europe, Copenhagen, 106 p. (Trombitsky, Ilya, Eco-TIRAS International Environmental Association of River Keepers)
697	23	31	34	31	25	What evidence is there to support this statement about contaminants? (UNITED STATES OF AMERICA)
698	23	31	35	31	37	One can imagine scenarios where it would be good to not have nutrients transported downstream. So? (UNITED STATES OF AMERICA)
699	23	31	36	31	36	Please define "P-retention" and "P-load" (UNITED STATES OF AMERICA)
700	23	31	40	31	43	The sentence implies that nutrient loads will go up even when river flow (Q) is going down. Q and nutrient loading tend to be positively correlated, not negatively correlated. Something would need to be affecting nutrient inputs at the source end, but the connection is not clearly made here. That whole paragraph needs to be rethought and rewritten. (UNITED STATES OF AMERICA)
701	23	31	45	31	47	Sentence is grammatically incorrect and not clear. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
702	23	31	45	31	47	This sentence does not make sense - it seems to confuse changes in nutrient loadings in northern and southern Europe (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)

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703	23	32	0	0	0	Disagreement to sentence "Farmers across Europe are currently adapting to climate change". On the contrary, farming is following unsustainable practices in the majority of European countries, a fact which has lead to the depletion of water resources as well as to considerable amounts of soil pollution due to the excessive use of fertilizers. Changes in the reformed Common Agricultural Policy to the direction of climate/environment protection needs to be referred. (Constantinos Cartalis, Environmental Physics, University of Athens, Greece) (GREECE)
704	23	32	5	32	7	Habitat shrinkage should not be occurring everywhere as something must be replacing what is lost and there is projected expansion of some e.g. boreal forests at higher latitudes. These two sentence therefore need putting in context/qualified. (Berry, Pam, Oxford)
705	23	32	5	32	37	This section does not explicitly discuss habitat quality. Habitats may move with climate change but the quality of new areas may be low, as plants/animals need time to adapt, (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
706	23	32	9	32	10	Instead of using "up to" to specify the ranges, it would be preferable to specify the lower and upper bounds of the full range more clearly. (Mach, Katharine, IPCC WGII TSU)
707	23	32	11	32	13	The last part of the sentence is not clear. How can plants inhabit areas that are "climatically unsuitable"? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
708	23	32	15	0	17	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
709	23	32	15	32	17	not 'mean altitude of the uplands is projected to increase' but 'mean altitude of the upland communities is projected to increase' (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
710	23	32	19	32	19	In respect to --> "With respect to" (Cassardo, Claudio, University of Torino)
711	23	32	31	0	34	I suggest the following phrase to be added. "These estimates are drawn from studies which consider changes in the conditions of sites and hence their ability to conserve species under future scenarios, but which ignore the connectivity-related spatial properties of the network that could facilitate flow of individuals and colonization between neighboring sites. In a recent study, Mazaris et al. (2013) demonstrated that the spatial distribution of the Natura 2000 network could facilitate connectivity between sites for four birds of prey providing rather robust sub-networks that could ensure species conservation". [Citation for this is the following: Mazaris, A.D., A.D. Papanikolaou, M. Barbet-Massin, A.S. Kallimanis, F.Jiguet, D.S. Schmeller, and J.D. Pantis, 2013: Evaluating the connectivity of a protected areas' network under the prism of global change: the efficiency of the European Natura 2000 network for four birds of prey. PLoS ONE 8, e59640. This phrase could be inserted in line 35, before the sentence starting with 'It has been highlighted ...']. (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)

#	Ch	From Page	From Line	To Page	To Line	Comment
712	23	32	31	32	34	Citation: "Protected areas play a key role for conservation of biodiversity under climate change compared to unprotected areas, although by 2080, 58+/- 2.6% of the species would lose suitable climate in protected areas. Natura 2000 areas will be not effective or more impacted than unprotected areas, under A1FI, A2, B1, B2 scenarios (Araujo et al., 2011). Similar concerns about effectiveness of protected areas are found for butterflies in Germany (Filz et al., 2012)." Comment: 1) in the given sentence it is not clear that in the original paper of Araujo the analysis differentiates between three categories: protected areas, unprotected areas and Natura 2000. This may lead to confusion. 2) One key finding is based on data of plants ("in fact, the Natura 2000 is less effective in retaining suitable climate for plant species than sets of randomly selected unprotected areas") but data of birds show different results ("For half of the remaining combinations of taxonomic groups and scenarios, the Natura 2000 provides no better buffer against climate change than areas outside the network, with the exception of birds"). 3) In Araujo's paper some explanations are given for differences in changes of climate suitability between protected areas and Natura 2000: "Differences in changes of climate suitability between protected areas and Natura 2000 are partly related with topography. Most protected areas are in mountains or rugged environments. The Natura 2000 also prioritizes farmlands and these are located in lower and flatter lands. Because proportional range losses arising from climate change are usually more pronounced in flatlands than in rugged terrains, the Natura 2000 is more vulnerable to climate change." Suggestion: Due to the reduction of findings and explanations of the original paper the given sentences may lead to misinterpretations. Therefore, we propose to either delete the statement about Natura 2000 here and add some explanations about protected areas, so the sentence would read: "Protected areas play a key role for conservation of biodiversity under climate change compared to unprotected areas, although by 2080, 58+/- 2.6% of the species would lose suitable climate in protected areas under A1FI, A2, B1, B2 scenarios, since the protected areas analysed are mainly located in mountainous areas" or to give an explanation about protected areas and make an additional statement about Natura 2000, so the sentence would read: "Protected areas play a key role for conservation of biodiversity under climate change compared to unprotected areas, although by 2080, 58+/- 2.6% of the species would lose suitable climate in protected areas, since the protected areas analysed are mainly located in mountainous areas. Natura 2000 areas will be more impacted than unprotected areas, under A1FI, A2, B1, B2 scenarios (Araujo et al., 2011). Similar concerns about effectiveness of protected areas are found for butterflies in Germany (Filz et al., 2012). However, Natura 2000 areas have a higher potential to serve as stepping stones and to receive new species than unprotected areas (Ellwanger et al., 2012)." Literature cited: Ellwanger, G., Ssymank, A. Paulsch, C. (Eds.) (2012): Natura 2000 and Climate Change – a Challenge. – Naturschutz und Biologische Vielfalt 118. – Münster (Landwirtschaftsverlag), 212 pp. (GERMANY)
713	23	32	32	32	32	58 +/- 2.6% --> "58 +/-3" (Cassardo, Claudio, University of Torino)
714	23	32	32	32	32	It would be helpful to clarify if the projected outcome here is across all 4 scenarios listed on line 34. (Mach, Katharine, IPCC WGII TSU)
715	23	32	33	32	33	Please define Natura 2000 areas (UNITED STATES OF AMERICA)
716	23	32	33	32	34	This sentence is not clear. 58% of which species? All species? A sample of species? Also, the statement on Natura 2000, out of context, is misleading. See comment related about page 5 (23-25). (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
717	23	32	38	32	0	A totality of shifts in ecosystem composition and local losses of habitats and species, noted in section 23.6.4, mean that consequences will be more deteriorative in heavily transformed landscapes with strong fragmentation and deficit of natural and subnatural habitats; e.g. that was noted for Moldova (Andreev, 2011) (Andreev, A.V., 2011: Factors of probable future changes of (sub)natural ecosystems, linked with climate change. [Trombitsky, I. and Corobov R. (ed.)]. Transboundary cooperation in climate change adaptation of the Dniester River basin. Collection of scientific articles. Kishinev: ECO-Tiras. P. 8-20. [In Russian.]) (Andreev, Alexei, BIOTICA Ecological Society)

#	Ch	From Page	From Line	To Page	To Line	Comment
718	23	32	40	33	8	There is disagreement between physiological modelling results and modelling using climatic (or other) envelopes. The range wherein e.g. trees can grow often by far exceeds the range of conditions represented by any envelope. Please have a look into this and make sure the literature you use here reflects both aspects. (Rock, Joachim, Johann Heinrich von Thuenen-Institute, Federal Research Institute for Rural Areas, Forestry and Fisheries)
719	23	32	40	33	38	In southern Europe, loss of biodiversity will be more extreme because southern Europe is cut off northern Africa by the intervention of the Mediterranean Sea. The Mediterranean is an important barrier for many species that cannot cross it, for example ground living arthropods or snails. (Anastasios Legakis, Department of Biology, University of Athens, Greece) (GREECE)
720	23	32	43	0	0	PEÑUELAS J., OGAYA R., BOADA M., JUMP A. 2007. Migration, invasion and decline: changes in recruitment and forest structure in a warming-linked shift of European beech forest in Catalonia. <i>Ecography</i> 30: 829-838. (Penuelas, Josep, CREAL-CSIC)
721	23	32	44	32	44	+3.9 and -1.4: which is the baseline? (Cassardo, Claudio, University of Torino)
722	23	32	46	32	48	Feehan et al is only a review and thus the original paper(s) should be cited. (Berry, Pam, Oxford)
723	23	32	47	32	47	10 days earlier than 50 years ago: 10/50 gives 2, while in the text 2.5 is referenced... (Cassardo, Claudio, University of Torino)
724	23	33	2	33	5	Trees are also slower to respond because of their longer time to reach reproduction and their longevity (Berry, Pam, Oxford)
725	23	33	5	33	7	The projections being communicated in this statement could be clarified--both parts of the sentence pertain to southern Europe?? How are 2020, 2050, and 2080 to be interpreted; are the patterns of change similar or different for these time periods? (Mach, Katharine, IPCC WGII TSU)
726	23	33	13	33	14	Feehan et al is only a review and thus the original paper(s) should be cited (Berry, Pam, Oxford)
727	23	33	13	33	14	Nevertheless, foreseen worsening of water quality means that extra generations are possible only for a limited number of damselfly species that are resistant to eutrophication and oxygen deficit while droughts suppress butterfly populations. (Andreev, Alexei, BIOTICA Ecological Society)
728	23	33	16	33	16	Casual usage of "likely" should be avoided, as it is a reserved likelihood term. (Mach, Katharine, IPCC WGII TSU)
729	23	33	18	33	35	These sentences imply the changes will occur or have occurred, yet the seem to refer to projections based on model results. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
730	23	33	22	33	22	typo: "2005)Jiguet" --> "2005) Jiguet" (Cassardo, Claudio, University of Torino)
731	23	33	26	0	0	Comparison of recent and retrospective data about populations of wild bees show that strengthening droughts may drastically influence upon pollinators of spontaneous flora and crops in southern part of the IPCC Continental subregion (Andreev et al., in press). (Andreev, A. Stratan, V., Gargalic., S. [In press.] Apoidea of Moldova in the contexts of climate change and landscape degradation. <i>Journal of Academy Sciences of Moldova. Life Sciences.</i>) (Andreev, Alexei, BIOTICA Ecological Society)
732	23	33	27	0	29	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
733	23	33	27	33	27	For the described "5-9%" is this the expected outcome without climate change?? This point could be clarified. Also, it would be preferable to provide the full range instead of the "up to" formulation. (Mach, Katharine, IPCC WGII TSU)
734	23	33	29	33	29	It would be helpful to clarify what is meant here by "climate cooling." As a hypothetical, as observed over deep-time historically, etc.? (Mach, Katharine, IPCC WGII TSU)

#	Ch	From Page	From Line	To Page	To Line	Comment
735	23	33	41	0	0	The section on invasives in Chapter 4 is excellent, as it covers the mechanisms of invasions and points out some gains AND losses. I don't know how many of the papers could be used here (Berry, Pam, Oxford)
736	23	33	45	0	0	Section Invasive. This section should also mention that species used for biofuel may become invasive (European Environment Agency (2012). The impacts of invasive alien species in Europe. doi:10.2800/65864) (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
737	23	34	5	35	3	23.6.5.: this section to be balanced with the North Atlantic and other sections in chapters 5, 6 and 30 (Menzel, Lena, Alfred Wegener Institute for Polar and Marine Research)
738	23	34	5	35	3	Generally this section doesn't do justice to the large amount of information on climate change and European seas, it is very superficial and could have taken much more from the OSPAR 2010 QSR or the UK MCCIP supporting documents (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
739	23	34	23	34	23	It should read "cod larvae" as adults do not eat zooplankton. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
740	23	34	23	34	28	this section contrasts the statement in the executive summary (Menzel, Lena, Alfred Wegener Institute for Polar and Marine Research)
741	23	34	24	34	25	This sentence gives the impression that cod have declined in all northern sea. It should say that there has been a decline in mid latitude areas such as the Irish Sea and North Sea but a massive increase further north (in the Barents Sea). (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
742	23	34	30	34	30	It should read "are also linked to the establishment and spreading of invasive species". (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
743	23	34	30	34	37	One could argue, cogently, that climate change has resulted in the redistribution and extension of range of organisms in the past, and that such changes in distribution are both natural and expected. The case for species colonizing an area that they have not been in before being called invasive (a pejorative term implying anthropogenic factors) under such conditions is obviously not strong. The point being made here, should be that the rate of climate change is unprecedented and anthropogenic. Therefore, species are thus invasive by that criterion. If so, this section might be made more clear. Otherwise, this section doesn't hold up very well to scrutiny. (UNITED STATES OF AMERICA)
744	23	34	32	34	32	Coordination with the ocean chapters could be considered for this statement. In general, it seems many semi-enclosed seas are not fully representative of other coastal and ocean ecosystems. (Mach, Katharine, IPCC WGII TSU)
745	23	34	34	34	34	has been associated with doesn't make sense in this context - check the grammar. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
746	23	34	42	34	45	It is not clear whether the freshwater input statement is part of the HELCOM reference. (UNITED STATES OF AMERICA)
747	23	34	43	34	43	Freshening of the salinity - phrase doesn't make sense. Seawaters can 'freshen' but salinity is a measure of freshening. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
748	23	34	47	34	47	It should read "wetter winters and summers in catchments surrounding the Arctic and North Sea". (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
749	23	34	49	34	51	It would be preferable to specify the relevant climate/socioeconomic scenario for this protected outcome. (Mach, Katharine, IPCC WGII TSU)
750	23	34	50	34	50	It should read "could inhibit growth and development of shell forming species". (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)

#	Ch	From Page	From Line	To Page	To Line	Comment
751	23	34	54	34	54	The authors could consider citing also the work of Kontogianni et al. (2011). (Citation: Kontogianni, A., Tourkolias, C., Skourtos, M., Papanikolaou, M. (2011). Linking Sea Level Rise Damage and Vulnerability Assessment: The Case of Greece, International Perspectives on Global Environmental Change, Young, S. (Ed.), pp. 375 – 398, InTech, Available at: http://www.intechopen.com/books/international-perspectives-on-global-environmental-change/linking-sea-level-rise-damage-and-vulnerability-assessment-the-case-of-greece). (Dimitris Damigos, Mining and Metallurgical Engineering, NTUA, Greece) (GREECE)
752	23	35	1	35	1	It should read "infrastructure development". (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
753	23	35	6	38	17	In 23.7 there is only one very short mention of adaptation strategies that concern terrestrial and freshwater biodiversity. At least, something should be added in Rural Development and also a short text on economic goods and services provided by biodiversity in Economic Assessments of Adaptations. (Anastasios Legakis, Department of Biology, University of Athens, Greece) (GREECE)
754	23	35	9	42	49	Especially Section 23-7 – 23-9: Well written as a discussion of various possibilities. Specifics, time lines and trajectories will, defacto, be impossible to predict. Nevertheless, the discussions of these important topical areas are likely to be critical to provide a framework for future policy making decisions. (UNITED STATES OF AMERICA)
755	23	35	12	0	13	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
756	23	35	12	35	12	“considerable progress” is perhaps too much reassuring. Good quality data is missing. EU legislation is missing if I am not mistaking. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
757	23	35	12	35	34	Line 12 says considerable progress has been made, yet line 33 says few measures have been implemented. Which is it? (UNITED STATES OF AMERICA)
758	23	35	14	35	17	Revise according to actual adoption of the Strategy (April 2013) and its contents (Communication + accompanying documents). The accompanying documents provide guidance to EU actors, and insights on EU mainstreaming adaptation into EU policies; the Communication focuses on ensuring informed adaptation action and support across the EU territory. The Climate Adaptation Platform could be renamed (Climate-ADAPT), defined (A Web-based platform aiming to support Europe in adapting to climate change) and the link added (http://climate-adapt.eea.europa.eu/) (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
759	23	35	17	35	17	to be published in March 2013: since we are now in May, it has been already published (Cassardo, Claudio, University of Torino)
760	23	35	27	0	30	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
761	23	35	29	35	29	seven: why do not indicate them? (Cassardo, Claudio, University of Torino)
762	23	35	37	0	0	Madrid does not have an adaptation plan or strategy. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
763	23	35	40	0	41	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
764	23	35	47	36	9	Section 23.7.1: Consider adaptation review in coastal zones. Brown S, Hanson S, Nicholls RJ: Implications of sea-level rise and extreme events around Europe: A review of coastal urban environments and adaptation. Submitted to Climatic Change (Brown, Sally, University of Southampton)

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765	23	35	51	35	52	The wording of this statement should be adjusted to avoid potential interpretations of policy prescription. (Mach, Katharine, IPCC WGII TSU)
766	23	36	12	0	0	This section deserves further development and linkage of water management with impacts and vulnerability to climate change (not only water for agriculture; a linkage with demands and consumption patterns in Industry, Urban and direct human consumption, energy...can be done. There are some studies addressing this.). Effects on management and planning and competing for water resources should be further developed. Transboundary issues should also be highlighted here. There are good examples of long-term planning in Europe that mainstream adaptation to climate change. The EU Water Policy should be quoted here. The Spanish Water regulation is another example of integration of climate projections into medium term water planning. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
767	23	36	12	36	12	I think that the Water Framework Directive (WFD), which operationally started in 2010, should be mentioned in this section (in the draft, the WFD is only mentioned with reference to the 'Water quality' issue). \nP36 L16: Discussions are on-going at the EU level on how Member States should incorporate climate change considerations into the implementation of EU water policy. This issue is all the more a highlight with the development of the first river basin management planning under the Water Framework Directive (WFD), which operationally started in 2010" (Quevauviller, 2011). Quevauviller, Ph, 2011: Adapting to climatic change: reducing water-related risks in Europe – EU policy and research considerations, Environ. Sci. Pol., 14(7), 722. (Borga, Marco, University of Padova)
768	23	36	23	36	24	The reference (UNECE, 2009) on the Guidance is absent in the list of references. I suppose this publication is: UNECE, 2009, Guidance on water adaptation to climate change. United Nations, New York and Geneva, 128 p. (Trombitsky, Ilya, Eco-TIRAS International Environmental Association of River Keepers)
769	23	36	24	0	0	To add after (EC, 2009b) the following reference: UNECE, 2009, Transboundary Flood Risk Management: Experience from the UNECE Region. United Nations, New York and Geneva, 79 pp. (Trombitsky, Ilya, Eco-TIRAS International Environmental Association of River Keepers)
770	23	36	26	0	0	I propose to add: Territorial cohesion in water management is discussed in (EEA, 2012). (EEA, 2012: Territorial cohesion and water management in Europe: the spatial perspective. EEA Technical report No. 4/2012, EEA, Copenhagen, 78 pp. doi:10.2800/49764 (Trombitsky, Ilya, Eco-TIRAS International Environmental Association of River Keepers)
771	23	36	29	36	50	This paragraph focuses very much on risks on the Rhine and the Rhine-Delta. You may consider adding results from the Alpine Region; e.g. the project Adaptalp (http://www.adaptalp.org/).\nA possible reference may be:\nAdaptAlp (2011): Meeting the risk of climate change and natural hazards in the Alps. Common Strategic Paper. http://www.adaptalp.org/index.php?option=com_docman&task=doc_download&gid=348&Itemid=79 \nSuggestion: add in line 39\nIn the Alpine area, an international network of governmental institutions has agreed on a list of 10 actions on how to include the current knowledge about climate impacts in natural hazard management. The climate impacts were assessed based on an ensemble of 14 regional climate projections. (GERMANY)
772	23	36	34	0	0	I propose to add after '... mapping of flood risks': ...and risk-based management of river basins (Brils and Harris, 2009) (Brils, J. and B. Harris (Eds.). 2009. Towards Risk-Based Management of European River Basins: Key findings and recommendations of the RISKBASE project. Utrecht, the Netherlands, 47pp. (Trombitsky, Ilya, Eco-TIRAS International Environmental Association of River Keepers)

#	Ch	From Page	From Line	To Page	To Line	Comment
773	23	36	42	36	42	Options to reduce the consequences of flooding to exposed communities include social capacity building for natural hazards. Specific strategies of social capacity building include assessment and quantification of social vulnerability, as well as risk communication and risk education (Kuhlicke et al., 2011).\n\nKuhlicke, C., Steinführer, A., Begg, C., Bianchizza, C., Bründl, M., Buchecker, M., De Marchi, B., Di Masso Tarditti, M., Höppner, C., Komac, B., Lemkow, L., Luther, J., Mccarthy, S., Pellizzoni, L., Renn, O., Scolobig, A., Supramaniam, M., Tapsell, S., Wachinger, G., Walker, G., Whittle, R., Zorn, M., Faulkner, H., 2011: Perspectives on social capacity building for natural hazards: Outlining an emerging field of research and practice in Europe. Environmental Science and Policy, 14 (7), pp. 804-814. (Borga, Marco, University of Padova)
774	23	36	51	26	51	in case you want to give an example on risk management with regard to urban heat, please see/wait for (submitted and under review): Wolf, T and GR McGregor: The Development of a Heat Wave Vulnerability Index for London, United Kingdom. Weather and Climate Extremes. WACE-D-13-00001 and Wolf, T, McGregor GR and A Analitis: \nPerformance Assessment of a Heat Wave Vulnerability Index for Greater London, United Kingdom\nWeather, Climate and Society. WCAS-D-13-00014 (Wolf, Tanja, WHO Regional Office for Europe)
775	23	37	0	0	0	Section 23.7.4 this section is missing the links of land use planning to forest/agriculture/coastal areas etc. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
776	23	37	1	0	0	Section 23.7.4: The EEA Report -No 2/2012 "Urban adaptation to climate change in Europe" is not cited at all in this chapter. This section may be an appropriate one to do so. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
777	23	37	1	37	37	This section covers one of the largest issues for Europe: how to couple climate change resilience and adaptation, to economic growth and conservation. This section has spectacularly failed to address this. Natural England have published a series of reports on this issue. This reflects a purely academic based review on one that does not take account of real world examples, practical applications and solutions. (Viner, David, Private)
778	23	37	3	37	37	Lines 3, 16, and 32 seem to be self contradictory (UNITED STATES OF AMERICA)
779	23	37	5	37	5	"lacks concrete instruments" is a wrong message and also a contradiction since in other parts of the chapter concrete instruments are motioned with respect to spatial planning. "Managed retreat" is mentioned in page 28 line 1 for example. This can be a no-cost instrument adopted in spatial planning. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
780	23	37	6	0	9	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
781	23	37	6	37	6	The author team could consider presenting calibrated uncertainty language to characterize the evidence described here, following the uncertainties guidance for authors. (Mach, Katharine, IPCC WGII TSU)
782	23	37	9	37	11	In many counties' could be replaced by 'In some countries' (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
783	23	37	24	37	27	Please add short explanation of "green infrastructure" as in EU COM (2013): "Green Infrastructure is addressing the spatial structure of natural and semi-natural areas but also other environmental features which enables citizens to benefit from its multiple services. The underlying principle of Green Infrastructure is that the same area of land can frequently offer multiple benefits if ecosystems its ecosystems are in a healthy state." (Source: European Commission 2013 Green Infrastructure (GI) - Enhancing Europe's Natural Capital. Brussels COM (2013) 249 final, 6.5.2013) (GERMANY)
784	23	37	25	37	25	a number of planners would argue that "increasing property values" can be a benefit for an owner but not for an urban area (gentrification etc) (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)

#	Ch	From Page	From Line	To Page	To Line	Comment
785	23	37	28	37	28	I have the impression that the text tends to focus to what is costly and perhaps minor in terms of mitigation impact and miss the important no-cost mitigation through planning (e.g. managed retreat). (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
786	23	37	30	0	0	You could also cite Hamin, Elisabeth M., et Nicole Gurran. 2009. « Urban form and climate change: Balancing adaptation and mitigation in the U.S. and Australia ». <i>Habitat International</i> 33 (3) (july): 238-245. (Viguié, Vincent, CIRED)
787	23	37	32	37	32	European policies might look to spatial planning for these reasons but they do not care to provide reliable data to spatial planning. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
788	23	37	49	0	50	Please explain better what this finding means. (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
789	23	38	2	0	0	Section 23.7.6 & Table 23-3: The Bank of Greece (2011) financed a study of climate change impacts on Greece (http://www.bankofgreece.gr/Pages/en/klima/default.aspx). Chapter 3 of the report provides an assessment of the cost of climate change for Greece, including cost of adaptation measures (e.g. cost of implementing adaptation measures for protecting the coastal system for 2100: from €381.6 million to €3,345.6 million). Bank of Greece, 2011: The environmental, economic and social impacts of climate change in Greece, Climate Change Impacts Study Committee, 494p. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
790	23	38	9	38	9	another paper in which one of the conclusions is that "The comparison between the climatological indices over the 30 years reference period 1971–2000 and the decade 2000–2009 outlined a general decrease in the amount of snow precipitation, and a shift in the seasonal distribution of the snow precipitation in the most recent period." is by Terzago S., Cassardo C., Cremonini R. and Fratianni S. (2010): "Snow Precipitation and Snow Cover Climatic Variability for the Period 1971–2009 in the Southwestern Italian Alps: The 2008–2009 Snow Season Case Study", <i>Water</i> , 2, 773-787; doi:10.3390/w2040773 (Cassardo, Claudio, University of Torino)
791	23	38	13	38	13	in Europe and the Netherlands: the Netherlands is Europe, so please change in "the whole Europe and the Netherland alone", or something similar (Cassardo, Claudio, University of Torino)
792	23	38	23	0	0	Air Quality deserves a separate section under the Co-Benefits ... chapter. After all, the effects of bad air quality of health in Europe are among the most important public health problems today and as air quality interacts with climate change, mutual co-benefits of mitigation measures are important. (Klea Katsouyanni, Hygiene, Epidemiology and Medical Statistics, University of Athens Medical School, Greece) (GREECE)
793	23	38	23	38	33	A review of climate change adaptation and mitigation strategies for agriculture, forests, energy, urban, rivers and coasts, health, tourism and conservation, and their effect on biodiversity is provided in Berry, P.M. (ed.) (2009) <i>Biodiversity in the Balance – Mitigation and Adaptation Conflicts and Synergies</i> . Pensoft Publishers, Sofia, Bulgaria. Also in Paterson, J.S., Araújo, M.B., Berry, P.M., Piper, J.M., and Rounsevell, M.D.A.R. (2008) Mitigation, adaptation and the threat to biodiversity. <i>Conservation Biology</i> , 22, 1352-1355. Also for energy - Berry, P.M. and Paterson, J.S. (2009) Energy mitigation, adaptation and biodiversity: synergies and antagonisms. <i>Beyond Kyoto: Addressing the Challenges of Climate Change</i> . IOP Conference Series: Earth and Environmental Science 8, 012023. doi:10.1088/1755-1315/8/1/012023. (Berry, Pam, Oxford)
794	23	38	25	0	0	This paragraph's discussion should cross reference the chapter that deals with adaptation and mitigation synergies. The current discussion is not specific to the region of the chapter. (Yao, Xiangjun, Food and Agriculture Organization of the United Nations (FAO))

#	Ch	From Page	From Line	To Page	To Line	Comment
795	23	38	36	0	0	In section 23.8.1, you may also cite two other examples of trade-offs between mitigation and adaptation: the "density conundrum" (cf. section 8.5.2) and the trade-off between density and natural hazard exposure (cf. Viguié, Vincent, and Hallegatte, Stéphane . 2012. « Trade-offs and Synergies in Urban Climate Policies ». Nature Climate Change 2 (5) (mars 4): 334?337. doi:10.1038/nclimate1434. Burby, R. J, A. C Nelson, D. Parker, et J. Handmer. 2001. « Urban Containment Policy and Exposure to Natural Hazards: Is There a Connection? » Journal of Environmental Planning and Management 44 (4): 475–490.\nBurby, R.J., E. L Birch, et S. M Wachter. 2006. « The problems of containment and the promise of planning. » In Rebuilding urban places after disaster: lessons from Hurricane Katrina. University of Pennsylvania Press.)\n\n (Viguié, Vincent, CIRED)
796	23	38	38	38	38	Casual usage of "likely" should be avoided, as it is a reserved likelihood term. (Mach, Katharine, IPCC WGII TSU)
797	23	38	38	38	43	Why is this discussion about dwellings here and not in settlements section? (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
798	23	38	41	38	42	...some acting to reduce temperatures and others acting to increase temperatures is not clear; need to rephrase. (Costas Balaras, Institute for Environmental Research and Sustainable Development, National Observatory of Athens, Greece) (GREECE)
799	23	38	46	38	46	Instead of "up to 27%" it would be much preferable to provide the full projected range, including both lower and upper bounds. (Mach, Katharine, IPCC WGII TSU)
800	23	39	1	39	1	It would be preferable to specify further and with more detail what is meant by "potential. (Mach, Katharine, IPCC WGII TSU)
801	23	39	4	39	20	these parts also look out of place. E.g. tourism is not production and to discuss ski resorts in terms of infrastructure is very limited. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
802	23	39	8	39	10	if they use renewable energy (like solar), they will not emit (or emit very few) GG (Cassardo, Claudio, University of Torino)
803	23	39	25	39	54	23.8.2 This section needs to account for the interactions of heatwaves on the carbon flux. For example the increase in CO2 flux from the terrestrial sink to the atmosphere in 2003 and 2010. (Viner, David, Private)
804	23	39	30	39	32	The way the text is worded right now is an over-simplification and could lead to misinterpretations, unfortunately. Please check whether this statement relates to the SINK really and not to the POOLS. "Sink" refers to the uptake of C from the atmosphere and is - to a certain extent - not depending on the size of the underlying pools. Changes in the C stocks in the pool lead to a calculatory weakening of the sink, although the absolute removal from the atmosphere may even be increased. Thus, the fate of the C taken from the pools has to be considered in such a case, too. (Rock, Joachim, Johann Heinrich von Thuenen-Institute, Federal Research Institute for Rural Areas, Forestry and Fisheries)
805	23	39	31	0	31	'25-40' what? (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
806	23	39	31	39	31	25-40% (Pechoux, Martin, Institut des Foraminifères Symbiotiques)
807	23	39	31	39	31	Add "%" after "25-40". (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
808	23	39	35	39	37	I would not call ecological restoration of abandoned land an agricultural practice. In this respect, the EU Biodiversity Strategy to 2020 (http://ec.europa.eu/environment/nature/biodiversity/comm2006/2020.htm) should be mentioned in this chapter. The strategy includes measures with profound implications on CC adaption and mitigation. (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
809	23	39	35	39	44	This paragraph is weak because it contains multiple topics and rewriting is suggested. A better statement would be "substitution of manufactured N fertilizer with biological N fixation." (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
810	23	39	46	40	9	Are these discussions specific to the region of the chapter? If not, take it out from the chapter and move it to chapter 7. (Yao, Xiangjun, Food and Agriculture Organization of the United Nations (FAO))
811	23	40	0	0	0	Figure 23.8 is attributed to the wrong Paterson. The original reference is Paterson, J.S., Araújo, M.B., Berry, P.M., Piper, J.M., and Rounsevell, M.D.A.R. (2008) Mitigation, adaptation and the threat to biodiversity. Conservation Biology, 22, 1352-1355. (Berry, Pam, Oxford)
812	23	40	5	40	15	What about loss of land for growing crops if it is used for bioenergy instead? Might this drive deforestation or other ecosystem degradation in other countries? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
813	23	40	10	40	14	Where "could" is used on line 10 and 14, it would be preferable to specify more precisely on what factors the outcomes are conditional. (Mach, Katharine, IPCC WGII TSU)
814	23	40	20	0	20	Please replace 'significant' with another word; keep it only for statistical significance. (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
815	23	40	21	0	23	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
816	23	40	22	40	22	to coherent should be "to develop coherent" (UNITED STATES OF AMERICA)
817	23	40	26	40	28	What are the results of the research into housing? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
818	23	40	31	41	5	In 23.8 there is no mention of adaptation strategies that concern terrestrial and freshwater biodiversity, apart from one figure (fig. 23.8). (Anastasios Legakis, Department of Biology, University of Athens, Greece) (GREECE)
819	23	40	36	40	36	Use the "should" could be considered prescriptive, and it may be preferable to adjust wording here. (Mach, Katharine, IPCC WGII TSU)
820	23	40	39	40	39	Casual usage of "likely" should be avoided, as it is a reserved likelihood term. (Mach, Katharine, IPCC WGII TSU)
821	23	40	48	0	0	Given above comment need to change reference to Paterson et al., 2008 (Berry, Pam, Oxford)
822	23	41	2	0	0	Given above comment need to change reference to Paterson et al., 2008 (Berry, Pam, Oxford)
823	23	41	5	41	5	Why will there be a need for urbanization on nature conservation? (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
824	23	41	8	41	16	Citing the studies about Nordic countries having a higher adaptive capacity than Southern European countries is important, but for a document such as this report, leaving out the primary reasons for that finding is problematic. I'd suggest bolstering this subsection to explain why the Nordic countries are more advanced on adaptation (e.g. is it cultural? is it because of an easier set of environmental challenges?) (UNITED STATES OF AMERICA)
825	23	41	11	41	11	Casual usage of "likely" should be avoided, as it is a reserved likelihood term. (Mach, Katharine, IPCC WGII TSU)
826	23	41	13	41	13	Greiving et al. had no corresponding entry in the bibliography, same with ESPON, for that matter. (UNITED STATES OF AMERICA)
827	23	41	13	41	13	The references Greiving et al. and ESPON lack date of publication. (UNITED STATES OF AMERICA)
828	23	41	21	0	21	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
829	23	41	31	41	32	The relevant climate/socioeconomic scenarios and other assumptions for this projection should be specified. (Mach, Katharine, IPCC WGII TSU)

#	Ch	From Page	From Line	To Page	To Line	Comment
830	23	41	32	41	32	Are these four items agriculture, river floods, coastal areas, and tourism - "market impacts" or topic areas? (UNITED STATES OF AMERICA)
831	23	42	1	42	49	The importance of the interactions of tourism with climate change, society and the environment have been overlooked in this section. This should relate back to 23.3.6 (Viner, David, Private)
832	23	42	3	42	3	Casual usage of "likely" should be avoided, as it is a reserved likelihood term. (Mach, Katharine, IPCC WGII TSU)
833	23	42	4	42	4	Europe region. Further, the region is --> "European region. Further, Europe is" (Cassardo, Claudio, University of Torino)
834	23	42	9	0	0	Box 23-3 "Climate Change Impacts in the Mediterranean" is interesting, yet incomplete. Further (quantitative) information needs to be provided in terms of changes on sea surface temperature distribution, coastal erosion, depletion of fishing stocks, desertification.(Constantinos Cartalis, Environmental Physics, University of Athens, Greece) (GREECE)
835	23	42	9	42	27	In Box 23.3 it is not clear whether the text refers to the terrestrial or the marine part of Mediterranean countries. (Anastasios Legakis, Department of Biology, University of Athens, Greece) (GREECE)
836	23	42	9	42	28	Now it should be possible to refer to the Regional Assessment of Climate Change in the Mediterranean. For the health impacts see: Tanja Wolf et al. Health. In: Regional Assessment of Climate Change in the Mediterranean: Part V: People. Springer, Springer. http://www.springer.com/earth+sciences+and+geography/earth+system+sciences/book/978-94-007-5768-4 (Wolf, Tanja, WHO Regional Office for Europe)
837	23	42	22	42	22	Casual usage of "likely" should be avoided, as it is a reserved likelihood term. (Mach, Katharine, IPCC WGII TSU)
838	23	42	37	42	37	The sentence says "Another inter-regional implication concerns the changes in the location of commercial fish stocks shared with non member states". The whole chapter 23 is titled "Europe" but not "European Union" and therefore it is not correct to talk about member states here without explicitly defining the term. Without doing so member states could equally well refer to UN or NATO member states, which is hardly the intention here. The text should therefore say "shared between different states within the European region". (ICELAND)
839	23	43	1	43	1	I wonder if the author team have checked out the ESPON report on vulnerability to climate change in Europe, though it remains to be seen if this adds any new insights to what you already have in the chapter (full reference is given here, so I've done the hard transcription work for you!): Greiving S, Flex F, Lindner C, Lückenötter J, Schmidt-Thomé P, Klein J, Tarvainen T, Jarva J, Backman B, Luoma S, Langeland O, Langset B, Medby P, Davoudi S, Tranos E, Holsten A, Kropp J, Walter C, Lissner T, Roithmeier O, M. K, Juhola S, P. N, Peltonen L, Vehmas J, Sauri D, Serra A, Olcina J, March H, Martín-Vide J, Vera F, Padilla E, Serra-Llobet A, Csete M, Pálvölgyi T, Göncz A, Király D, Schneller K, Staub F, Peleanu I, Petrisor A-I, Dzurdzenik J, Tesliar J, Visy E, Bouwman A, Knoop J, Ligtoet W, van Minnen J, Kruse S, Pütz M, Stiffler M, Baumgartner D (2011) ESPON Climate: Climate Change and Territorial Effects on Regions and Local Economies. Scientific Report., ESPON & IRPUD, TU Dortmund University, Germany, p. 291. (Carter, Timothy, Finnish Environment Institute)
840	23	43	3	0	0	Section 23.10.1. Given the emphasis of chapter 19 and the report as a whole, it would be preferable here to present key risks instead of key vulnerabilities. Additionally, it would be helpful to indicate, wherever possible, the degree to which key risks increase with increasing level of climate change and the degree to which they can be reduced through adaptation. And, for all material in this section, clear line-of-sight references should be provided to supporting chapter sections. (Mach, Katharine, IPCC WGII TSU)
841	23	43	3	0	0	Section 23.10.1: This information is very useful, but also overlaps with the executive summary. Please consider how these presentations interact, and ensure that the key messages are presented clearly in the executive summary. For material retained here, please ensure clear line of sight to other chapter sections where this material is discussed, and also consider what information is appropriate to present here without calibrated uncertainty language. Conclusions of the chapter should not be presented here without such language. (Mastrandrea, Michael, IPCC WGII TSU)

#	Ch	From Page	From Line	To Page	To Line	Comment
842	23	43	10	43	12	This statement need some qualification based on the time-scale considered. For species, for example, climate change is reckoned to become more important by the middle of the 21st century (Berry, Pam, Oxford)
843	23	43	19	43	19	It could be helpful to clarify what is meant by "confirmed"--for example, it could be possible to interpret this description as indicating that the vulnerabilities have been observed to play out to date in observed impacts. Presumably, the author team means that these are still future-oriented key vulnerabilities for which further research has confirmed already understood patterns of vulnerability and risk. (Mach, Katharine, IPCC WGII TSU)
844	23	43	19	44	41	The key findings (which are most likely to be read by decision makers) still should provide uncertainty guidance following the "calibrated language". (GERMANY)
845	23	43	24	43	25	This statement should be revised. As explained elsewhere, recent studies show a different pattern: non-significant trend in the number of fires since 1986 in Mediterranean Europe, and significant decrease in the last decade. Also a significant decrease in area burnt over the whole period. Jesús San-Miguel-Ayanz , Marcos Rodrigues , Sandra Santos de Oliveira, Claudia Kemper Pacheco , Francisco Moreira , Beatriz Duguy and Andrea Camia (2012). Land Cover Change and Fire Regime in the European Mediterranean Region. Chapter 2 in F. Moreira et al. (eds.), Post-Fire Management and Restoration of Southern European 21 Forests, Managing Forest Ecosystems 24, Elsevier. DOI 10.1007/978-94-007-2208-8_2 (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
846	23	43	31	40	31	This statement is too general - not all European settlements are at risk from flooding. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
847	23	43	33	0	0	Add to emerging vulnerabilities: "Increase of share of citizens living in cities by 2020 and respective trends in urban sprawl".(Constantinos Cartalis, Environmental Physics, University of Athens, Greece) (GREECE)
848	23	43	33	44	14	In 23.10.1, Emerging vulnerabilities, mention should be made to the fact that many non-migrating species of southern Europe will move northwards but they will not be replaced by other species since the Mediterranean Sea will act as a barrier. (Anastasios Legakis, Department of Biology, University of Athens, Greece) (GREECE)
849	23	43	37	0	37	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
850	23	43	39	43	39	Casual usage of "likely" should be avoided, as it is a reserved likelihood term. (Mach, Katharine, IPCC WGII TSU)
851	23	43	42	43	42	I am not sure that this is correct for areas connected to the energy grid where energy can be sold in other countries. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
852	23	43	46	43	46	Casual usage of "unlikely" should be avoided, as it is a reserved likelihood term. (Mach, Katharine, IPCC WGII TSU)
853	23	43	53	43	53	This is particularly important in semi-arid areas, as the pool of species adapted to drier and warmer conditions is missing in Europe (i.e., there are no European species to replace current ones in these areas, as climate will become drier and warmer) (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
854	23	43	54	44	1	The phrase 'There are legal barriers to introduce new species' is misleading because it suggests that the problem would be faced by changing laws and public opinion. The references on which this statement is based reflect only one sector of scientific opinion, namely those who believe that the current precautionary regime is too strong. The real problem is that the introduction of alien species have unforeseeable consequences and for this reason legal systems usually apply the precautionary principle. Before suggesting introduction of new species, other realistic options should be considered. For these reasons I suggest removal of the phrase. (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)

#	Ch	From Page	From Line	To Page	To Line	Comment
855	23	44	4	0	6	This phrase sounds like something from a pro-pesticides and antibiotics campaign. The author should better describe the potential danger, and also the need for our society to be on the alert so as to take appropriate measures and amend, if needed, public policies. There are major health and environmental implications and, therefore, this issue should not be dealt with and presented in simplistic ways. (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
856	23	44	8	44	8	Past events indicate the vulnerability of transport, energy agriculture, water resources and health systems. should be: "Past events indicate the vulnerability of transport, energy, agriculture, water resources and health systems."\\n\\n (NETHERLANDS)
857	23	44	20	44	21	Section 23.10.2 needs to go much earlier in Section 23.2 (Berry, Pam, Oxford)
858	23	44	22	0	0	There are two Tables 23-6, of which you are referring to the 2nd here. The first one, on limits to adaptation, is important but appears not to be referenced in the text. (Parker, David, Met Office Hadley Centre)
859	23	44	22	44	29	Table 23-6 does not do what the text says, "summarises the evidence. Perhaps the writer is refereing to table on page 89 instead of 88? What "further and better quality evidence since 2007"? Alcamo et al., is 2007, so, what came more recently? (UNITED STATES OF AMERICA)
860	23	44	28	44	36	All calibrated uncertainty language on these lines should be italicized, including summary terms for evidence and agreement, levels of confidence, and likelihood terms. (Mach, Katharine, IPCC WGII TSU)
861	23	44	31	44	38	Is there "high Confidence" that the increase is dure to increased exposures or is there high confidence that it is unclear about the contribution by climate change? Or both? (UNITED STATES OF AMERICA)
862	23	44	33	0	36	Please improve the phrase (unfinished sentences, and/or disagreement between subject and verb, and/or rather poor english) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
863	23	44	40	44	41	Reference to Table 23-6. there are two Tables 23-6 (page 88, and page 89-90). This references to page 89-90 (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
864	23	44	41	44	41	There are 2 Tables named 23-6 (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
865	23	44	44	24	33	Due to the academic bias of the authors there are few referecnes to practical commercial implememntation of climate change adapation/resilience. This should be addressed in the AR6, or even better a Special Report on Infrastructure and Resilience. (Viner, David, Private)
866	23	44	44	45	33	Section 23-10-3 (Key Knowledge Gaps and Research Needed): Well written and encapsulates many well known gaps. Assuredly, there are likely to be more gaps than mentioned. Perhaps this section should be expanded to include other gaps as noted throughout the chapters preceding. Suggest deleting references to specific examples in the bulleted itemized list, such as: air conditioning, tourism, air transport. (UNITED STATES OF AMERICA)
867	23	44	46	45	33	As section 23.10.3 is a very important section, much attention should be paid to it. (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
868	23	44	49	0	0	Additional specific research needs are: "Impact of climate change to cultural heritage", "Research on the resilience/vulnerability of populations to thermal stress", "Capacity of local and national government to respond to urban sprawl and promote sustainable spatial planning", "Research towards a commonly accepted set of climate change indicators", "Research on new materials for buildings/constructions for climate change mitigation".(Constantinos Cartalis, Environmental Physics, University of Athens, Greece) (GREECE)
869	23	44	50	0	51	Could be better (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)

#	Ch	From Page	From Line	To Page	To Line	Comment
870	23	44	52	0	53	What is the meaning of 'including the use of this information in decision making' in the context of (developing) tools for costing and valuation of specific adaptation options? (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
871	23	45	0	45	0	Who asked the Frequently asked questions? Why these three? (Viner, David, Private)
872	23	45	5	0	5	Could be much better (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
873	23	45	6	0	6	Could be much better (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
874	23	45	11	0	11	to inform policy? (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
875	23	45	15	0	16	Could be much better (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
876	23	45	21	45	21	What is purpose of phrase "[needs to be more specific]"? (UNITED STATES OF AMERICA)
877	23	45	23	45	24	I'd extend this point to cover not only extreme events but also gradual trends in temperature and precipitation. Estimations of species turnover in response to CC are still rudimentary. This should include studies on spontaneous colonization of non-European species on bioclimatic border areas. (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
878	23	45	28	45	33	The text is unclear. Is this trying to say governments sometimes impose policies that limit access to data? Is that what inappropriate confidentiality means? (UNITED STATES OF AMERICA)
879	23	45	29	0	30	Reasons should be better defined or explained (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
880	23	45	29	45	30	This sentence is particularly awkward - "reasons include: government agencies require commercialisation, inappropriate confidentiality." The structure is odd and a little more detail would be useful. (CANADA)
881	23	45	30	0	33	Could be much better (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
882	23	45	36	46	17	Please specify the source of these FAQ's. A survey of the public? Of scientists? One could think of many other FAQ's, such as "what are the most important mitigation actions needed and where?" and "what are the most important adaptation actions needed and where?" are two in particular that would be most welcomed for this chapter. (UNITED STATES OF AMERICA)
883	23	45	36	46	17	The chapter could benefit from additional FAQs. Some that we have identified as being valuable include: (1) What have been successful examples of adaptation planning in the region; (2) Can lessons learned/best practices be transferred? (UNITED STATES OF AMERICA)
884	23	45	36	46	17	The frequently asked questions section is a great idea, though we're puzzled that the collective group of authors only thought of three questions worth asking. Here are a few more to consider: What are the economic implications of the various climate implications for Europe cited in this chapter? What business sectors are likely to be most impacted? What regions, countries or provinces in Europe are most susceptible to climate change impacts? What are the primary sectors or geographic regions for which Europe must prioritize developing adaptation plans? As it is written now, it appears as though this was either rushed or done without substantial thought. We would suggest reviewing the entire chapter and putting a short but more useful series of FAQs together. (UNITED STATES OF AMERICA)
885	23	45	40	45	40	For the described increase in risk after the middle of the century, should it also be mentioned that the risk would increase differently depending on the relevant climate/socioeconomic scenario and emissions trajectory? (Mach, Katharine, IPCC WGII TSU)

#	Ch	From Page	From Line	To Page	To Line	Comment
886	23	45	49	45	50	The Mediterranean should be' included in the area where costal squeeze will take place. Many areas, like the coast of southern France and the northern Adriatic are already heavily protected by coastal defenses (Ciavola, Paolo, University of Ferrara)
887	23	45	52	46	2	While the text clearly states that climate impacts changes in vectors and hosts, it omits impacts on pathogens. All these, pathogens, vectors and host, can be impacted by climate change. This section should also specify that it is considering human public health aspects, not necessarily livestock, plant ecology health, etc. (UNITED STATES OF AMERICA)
888	23	46	6	46	6	Casual usage of "likely" should be avoided. (Mach, Katharine, IPCC WGII TSU)
889	23	46	10	46	17	This is a weak answer. Can't we do better than "may be compensated". Is compensation probable or merely possible? (Flint, David, Cass Business School)
890	23	49	14	0	0	Biodiversity and climate change: Reports and guidance developed under the Bern Convention – Volume II, 2012: Nature and Environment No. 160. ISBN 978-92-871-7059-0. 429 p. (Andreev, Alexei, BIOTICA Ecological Society)
891	23	50	51	50	52	The title of this reference should be: Suitability of European climate for the Asian tiger mosquito <i>Aedes albopictus</i> : recent trends and future scenarios (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
892	23	52	28	52	29	Incorrect wording of the reference. Must be: Corobov, R., S. Sheridan, N. Opopol and K. Ebi, 2012: Heat-related mortality in Moldova: the summer of 2007. International Journal of Climatology. doi: 10.1002/joc.3610. (Trombitsky, Ilya, Eco-TIRAS International Environmental Association of River Keepers)
893	23	55	14	55	18	The references "EEA, 2008" and "EEA-JRC-WHO, 2008" refer to the same publication; the correct reference is "EEA-JRC-WHO, 2008" (see comment above). (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
894	23	56	51	56	52	Reference is incorrect here. Should be: Fronzek, S., Luoto, M. and Carter, T.R. 2006. Potential effect of climate change on the distribution of palustrine mires in subarctic Fennoscandia. Climate Research 32: 1-12. (Carter, Timothy, Finnish Environment Institute)
895	23	57	55	57	56	The updated reference is:\n- Giuntoli, I., Renard, B., Vidal, J.-P., and Bard, A. (2013) Low flows in France and their relationship to large-scale climate indices. Journal of Hydrology, 482, 105-118. doi: 10.1016/j.jhydrol.2012.12.038 (Vidal, Jean-Philippe, Irstea)
896	23	65	32	0	0	Journal name should be Ecohealth. (Parker, David, Met Office Hadley Centre)
897	23	68	20	68	20	The reference information insufficient to locate document (UNITED STATES OF AMERICA)
898	23	69	34	69	36	Some typos in the author names, title and publication year. The complete reference is:\n- Paiva, R., Collischonn, W., Schnetterling, E. B., Vidal, J.-P., Hendrickx, F., and Lopez, A. (2010) The Case Studies. Chapter 6 in Modelling the impact of climate change on water resources [Fung, F.; Lopez, A. & New, M. (ed.)], Wiley-Blackwell, Chichester, UK. pp. 203 (Vidal, Jean-Philippe, Irstea)
899	23	78	35	78	36	First name initials are incomplete. The complete reference is:\n- Vidal, J.-P. and Wade, S. D. (2009) A multimodel assessment of future climatological droughts in the United Kingdom. International Journal of Climatology, 29(14), 2056-2071. doi: 10.1002/joc.1843 (Vidal, Jean-Philippe, Irstea)
900	23	80	14	80	14	first name is given instead of surname in the reference. The reference should be: Wong, W.K., Beldring, S., Engen-Skaugen, T., Haddeland, I. and Hisdal, H. (2011) Climate Change effects on spatiotemporal patterns of hydroclimatological summer droughts in Norway. J. Hydrometeor., 12, 1205-1220, doi: 10.1175/2011JHM1357.1 (Hisdal, Hege, Norwegian Water Resources and Energy Directorate)
901	23	81	0	0	0	Tabl23-1: In the legend, the symbol is *, whereas in the Table itself, it is x (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)

#	Ch	From Page	From Line	To Page	To Line	Comment
902	23	81	0	0	0	Table 23-1: Please provide information what the figure in parenthesis behind the climate parameters in column 2 refer to. (Ferrone, Andrew, Public Research Centre - Gabriel Lippmann)
903	23	81	0	0	0	Table 23-1: Please define the numbers in parenthesis in the column "Climate Parameters". Note that symbols used (x) in the table differ from the ones in the caption (*) and in the narrative. How is the growing season length defined? It is surprising to see the growing season length decrease in the Southern region of Europe in future projections. Is it the case that the temperatures are outside of the range acceptable for growth? If so, being that range dependent on the specie itself, how is that generalized in this table? Please clarify. (UNITED STATES OF AMERICA)
904	23	81	0	0	0	in rows 3 ("frost days") and 8 ("cold spell duration index") maximum values are lower than minimum ones. In column Atlantic, second row by bottom, I suppose "-11" is a typo for "11". Finally, I think that indices cannot be simply referenced as in the note, but should be summarized. (Cassardo, Claudio, University of Torino)
905	23	81	0	0	0	Table 23-1. Within the caption, it would be helpful also to clarify what the min and max within the "measure" column represent--the minimum and maximum projection within the ensemble? Additionally, all usages of "likely" should be italicized. Also, within the "climate parameters" entries, it would be helpful to clarify what the parenthetical numbers represent. Finally, for the index definition, is it possible to specify relevant publications as well in which the index is used or defined? (Mach, Katharine, IPCC WGII TSU)
906	23	81	0	85	0	Tables 23-1 A/B; 23-2; 23-4: Order of columns should be the same for all tables. (GERMANY)
907	23	82	0	0	0	Table 32-1. Short explanation of the variables listed in this Table may be needed. Otherwise, terms as 'summer days' and 'tropical nights' may be confusing, and may denote subjective perceptions (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
908	23	82	0	0	0	same as in previos page: maximum values are lower than minimum ones. (Cassardo, Claudio, University of Torino)
909	23	82	1	0	0	RCP2.6 is very important for 2 C target, so results from this scenario should also be presented here. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
910	23	83	0	0	0	Tabl23-2: Empty cells should be described what they correspond to: No change? No forecast? (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
911	23	83	0	0	0	Table 23-2. Pests rather than pest control are expected to decrease in the Southern sub-region and increase in the Continental, Northern and Alpine regions (Table 23-4). The alpine skiing season will stay the same or decrease (Table 23-4). (Parker, David, Met Office Hadley Centre)
912	23	83	0	0	0	Table 23.2 caption or content contains no bibliographical reference (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
913	23	83	0	0	0	Table 23-2: The table appears to try to convey the same sort of trend information that is in Table23-4. Both tables should use the same indicators, either words or arrows. Put both tables in the same column order. (UNITED STATES OF AMERICA)
914	23	83	0	0	0	Table 23-2: What is certainly of assessment entries? (UNITED STATES OF AMERICA)
915	23	83	0	0	0	an empty cell means statistically not significant, or no change? (Cassardo, Claudio, University of Torino)
916	23	83	0	0	0	Table 23-2. The timeframe for these impacts should be specified--are the trends for now through the end of the century? Also, wherever "increasing to decreasing" is described or "to" it would be helpful to clarify if a range of possible outcomes across models/scenarios is being indicated or if the direction of change is anticipated to change over time. (Mach, Katharine, IPCC WGII TSU)
917	23	83	1	0	0	1) It would be useful to have explanation on sources (and also confidence, uncertainty...)for building this table. 2) Why biodiversity is a cultural service? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
918	23	84	0	0	0	Table 23.3, column "Cost estimate", rows 5, 6 and 8: Are these costs per year? (GERMANY)

#	Ch	From Page	From Line	To Page	To Line	Comment
919	23	84	0	0	0	Table 23 - 3: Please replace "population" with "region". (Rock, Joachim, Johann Heinrich von Thuenen-Institute, Federal Research Institute for Rural Areas, Forestry and Fisheries)
920	23	84	0	0	0	Table 23-3. For these estimates, it would be preferable to specify as appropriate the relevant climate/socio-economic scenarios in addition to the relevant time frame. For the final example, it would be helpful to specify further what is meant by "future climatic conditions similar to those of 2003"--in terms of the observed heat wave that year? (Mach, Katharine, IPCC WGII TSU)
921	23	85	0	0	0	Tabl23-4: The last column should have a description on top; add Section (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
922	23	85	0	0	0	Table 23-4: The downward pointing arrow in the cell "Wind energy production / Southern" should be "red" rather than "green". (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
923	23	85	0	0	0	Table 23-4: Load factor of inland ships up to 2050. Different results are mentioned e.g. in the reference given in comment on chapter 23; page 14; line 43-46 or in: Holtmann B., Scholten, A., Baumhauer, R., Rothstein, B., Gründer, D., Renner, V., Nilson, E. (2012): Analyses of the Impact of Climate Change on Inland Waterway Transport and Industry on the Rhine. Weißensee Verlag. Bonn. 60-65. Available online: http://www.bmvbs.de/cae/servlet/contentblob/100384/publicationFile/69428/kliwas-second-status-conference.pdf (GERMANY)
924	23	85	0	0	0	Table 23-4: The decision to use color coding will mean that any reader seeing this in black and white print will not be able to discern whether it is a green or red or black arrow. (UNITED STATES OF AMERICA)
925	23	85	0	0	0	Table 23-4: The significance of the color on the arrows appears to be unclear. How can you have both positive and negative trends in arable production in the alpine zone? Perhaps this table should be removed, if no further clarifying information is available. (UNITED STATES OF AMERICA)
926	23	85	0	0	0	Table 23-4. Following from my overall comments on "characterization of future risks" the chapter team may wish to consider characterizing the degree to which risks can be reduced through proactive adaptation. Additionally, in the caption on page 86, it could be clarified what is meant when more than one arrow is given within a box--for such cases, are a range of projected outcomes found across models, is there variability in the outcome dependent on aspects of context, does the direction of change shift over time, etc.? (Mach, Katharine, IPCC WGII TSU)
927	23	85	0	0	0	Table 23-4: Can anything more be said that just direction of change in some cases (e.g., relative magnitudes)? Is there a way to integrate information on the extent to which adaptation can reduce these impacts into this table? (Mastrandrea, Michael, IPCC WGII TSU)
928	23	85	0	86	0	the format of the first column is wrong and part of words are superimposed!!! What is the use of the arrows in the middle of the page at page 86? (Cassardo, Claudio, University of Torino)
929	23	85	1	0	0	It is unclear that Table 23-4 provides a good synthesis of climate change impacts in Europe. Within Health and Social issues, Are the damage on cultural buildings or th loss of cultural landscapes the main concerns? What about poverty, inequalities, vulnerable groups and regions? Concerning environmental quality, what about the panoply of ecosystems goods and services, water availability, etc? Impacts to key economic sectors and infrastructure and assets are also missing (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
930	23	86	0	0	0	Table 23-4. Overprinting of table. (Athanasios Loukas, Civil Engineering Department, University of Thessaly, Greece) (GREECE)

#	Ch	From Page	From Line	To Page	To Line	Comment
931	23	87	0	0	0	Table 23.5: I propose to include in the row 2007/2008: In 2007 the hottest summer has been recorded since 1887 in Moldova that resulted in about 200 excess deaths in capital city Chisinau (Corobov et al, 2010; Corobov et al, 2012). (Trombitsky, Ilya, Eco-TIRAS International Environmental Association of River Keepers)
932	23	87	0	0	0	Tabl23-5: For 2003, there are no references for information of Production Systems etc. For 2007/2008, in the same column, among others it is written 'turned ... floods into a national catastrophe'. Since these years concern the regions of England and Wales and Southern Europe, we cannot know what national means here. In the third column for 2010, it is written since 150 (?), whereas in the fifth column it is written Crop yields (what happened to them?). Also, the Table and the cell content should be better formatted (for instance, there are periods in some cells, but not in others). (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
933	23	87	0	0	0	Table 23-5: The impact of the 2003 heat wave (hot summer) in Europe is stated with approx 35,000 deaths. In Table TS.2, in the TS, page 88 in comparison there are stated 70,000 excess deaths for the same 2003 summer. These statements have to be coherent. (GERMANY)
934	23	87	0	0	0	Table 23-5: What is "social distress" under agriculture? Is this supposed to be under the column "health and social welfare"? (UNITED STATES OF AMERICA)
935	23	87	0	0	0	Table 23-5. For the impacts described, is it possible to provide any information on the types of coping/adaptive responses observed and their effectiveness? (Mach, Katharine, IPCC WGII TSU)
936	23	87	1	0	0	Could also add March 2013 - coldest in UK for 50 years, has caused loss of many crops and livestock plus social distress in parts of the UK (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
937	23	88	0	0	0	Table 23.6: Is there really no adaptation approach for forests other than introducing new species? (see 2nd and 3rd columns for forests) (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
938	23	88	0	0	0	Table 23-6: Barredo et al., 2012 is cited by does not appear in the reference list (Ciavola, Paolo, University of Ferrara)
939	23	88	0	0	0	Table 23 - 6: Please check - if the solution is to use smaller vessels existing barges below the optimal size are no problem. (Rock, Joachim, Johann Heinrich von Thuenen-Institute, Federal Research Institute for Rural Areas, Forestry and Fisheries)
940	23	88	0	0	0	Table 23-6. This table is not introduced in the text of the chapter, and thus its interpretation should be clarified. Also, while the caption asserts that limits to adaptation are characterized here, it seems that barrier/constraints are very much emphasized. The scope of the table should be clarified. (Mach, Katharine, IPCC WGII TSU)
941	23	88	1	89	0	There are two tables with the same caption number. There is no reference in Chapter 23 in the table with the caption "Limits to adaptation measures in Europe". (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
942	23	89	0	0	0	Tabl23-6: 2nd column, for Atopic disease: Please remove s from pollens; it should be pollen. Also, the citation Ariano et al. 2010 does not exist in References (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
943	23	89	0	0	0	Table 23-6: How about farmer responses in sowing of spring crops? See: Kaukoranta T, Hakala K (2008) Impact of spring warming on sowing times of cereal, potato and sugar beet in Finland. Agricultural and Food Science 17:165-176. (Carter, Timothy, Finnish Environment Institute)

#	Ch	From Page	From Line	To Page	To Line	Comment
944	23	89	0	0	0	Tree spices should be: "Tree species"\n\n (NETHERLANDS)
945	23	89	0	0	0	Table should be 23 - 7 and "tree spices" are meant to be "tree species", I suppose. (Rock, Joachim, Johann Heinrich von Thuenen-Institute, Federal Research Institute for Rural Areas, Forestry and Fisheries)
946	23	89	0	0	0	Table 23-6. All calibrated uncertainty language within the table should be italicized. (Mach, Katharine, IPCC WGII TSU)
947	23	90	0	0	0	Table 23.6. No level of confidence in detection is given. (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
948	23	91	0	0	0	Figure 23-1 the coastline should be visible for all countries within the frame of the map for orientation purposes The projection of the map is probably wrong distorting northern countries. Lambert projection is typically used for Europe (23.6 is probably Lambert) (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
949	23	91	0	0	0	Figure 23-1: Please add political boundaries to the map, so as to better distinguish the different regions. (Ferrone, Andrew, Public Research Centre - Gabriel Lippmann)
950	23	91	0	0	0	Fig 23.1: is it really useful to use that a fine separation of regions? Alpine regions can be found in the north, east and so one? Are trends in those regions really comparable? (Kreienkamp, Frank, Climate & Environment Consulting Potsdam GmbH)
951	23	91	0	0	0	Figure 23-1: It is not very easy to differentiate the patterns in the legend. Readability of the image could be improved by adopting more contrast between the patterns used. (UNITED STATES OF AMERICA)
952	23	91	0	0	0	Figure 23-1. It could be very helpful to also show country borders on this map. (Mach, Katharine, IPCC WGII TSU)
953	23	92	0	0	0	Figure 23.2. Marginally readable. Areas seem distorted. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
954	23	92	0	0	0	Figure 23-2: This comment applies to this figure, but also Fig 23-3, 23-4. The hatched areas between robustness and significance are difficult to discern. I suggest to not include white colour in the colour scheme, and put colours only there where changes are robust between models. The regions where statistical significance is reached can then be hatched. (Ferrone, Andrew, Public Research Centre - Gabriel Lippmann)
955	23	92	0	0	0	Figure 23-2: The two panels A and B present multi-model ensemble projections for two similar emission scenarios. One would assume that these two projections are rather similar, but this is not the case. Please double-check the correctness of panel B. If that panel was indeed correct, a clear explanation is needed why the projections from the EURO-CORDEX experiment no longer project an increase in heat waves. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
956	23	92	0	0	0	Fig. 23-2. Do not use the term 'unfortunately' in the caption, as it denotes subjectivity (CORTINA, JORDI, UNIVERSITY OF ALICANTE)

#	Ch	From Page	From Line	To Page	To Line	Comment
957	23	92	0	100	0	Figures: The hashing makes the maps look fuzzy and hard to understand the details of the map. Use lighter hashing or increase the contrast between hashing color and background color. (Estrada, Yuka, IPCC WGII TSU)
958	23	92	30	93	30	Where is the information on the number of cold waves. They are far more significant (Gray, Vincent, Climate Consultant)
959	23	93	0	0	0	Figure 23.3. Marginally readable. Areas seem distorted. Bad maps. (Dimitris Stathakis, Urban and Regional Planning, University of Thessaly, Greece) (GREECE)
960	23	93	0	0	0	Figure 23-2B: This figure is very faint and difficult to follow details. (UNITED STATES OF AMERICA)
961	23	94	0	0	0	Fig23-3: There should be written somewhere that DJF corresponds to December, January, February, MAM to... (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
962	23	94	0	0	0	Fig. 23-2. Do not use the term 'unfortunately' in the caption, as it denotes subjectivity (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
963	23	94	0	0	0	Figure 23-3: Both A and B (page 95) are too faint to read with clarity. The robustness and significance hatching doesn't have enough contrast against the dark green background. A lighter color background and more emphasis on the hatching might ameliorate this. (UNITED STATES OF AMERICA)
964	23	94	0	0	0	Figure 23-3. It is hard to see the color underneath the hatching. Alternative visualizations should be considered to enhance clarity. (Mach, Katharine, IPCC WGII TSU)
965	23	94	0	95	0	Figure 23 - 3: Please reconsider the choice of colours for the class "30 - 40" and the hatchings (and width of hatching). This is hardly distinguishable. (Rock, Joachim, Johann Heinrich von Thuenen-Institute, Federal Research Institute for Rural Areas, Forestry and Fisheries)
966	23	94	1	95	0	Hatched areas are very difficult to see, and distinguishing areas which have either robust changes or significant changes only is impossible. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
967	23	96	0	0	0	Fig. 23-2. Do not use the term 'unfortunately' in the caption, as it denotes subjectivity (CORTINA, JORDI, UNIVERSITY OF ALICANTE)
968	23	96	0	97	0	Fig23-4: In the legend, it is written that 'For the eastern part of Turkey, unfortunately no regional climate model projections are available. Although this is seen in Fig (A), it is not in (B), where projections cover all Turkey [please check also the dot in eastern Turkey, in Fig. 23-2 (B)] (Despoina Vokou, Department of Ecology, School of Biology, Aristotle University of Thessaloniki, Greece) (GREECE)
969	23	98	0	0	0	Do the acronyms A2/B2 refer to SRES scenarios? Also give more information on the scenarios considered. (Ferrone, Andrew, Public Research Centre - Gabriel Lippmann)
970	23	98	0	0	0	Figure 23-5: The y-axis labels is written over the tick-marks for the y-axis such that both are illegible. (UNITED STATES OF AMERICA)
971	23	98	0	0	0	Figure 23-5: User a graduated color bar for the 5 climate scenarios, from light emissions to heavier so that the eye can attend to the detail. (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
972	23	98	0	0	0	Figure 23 - 5: If climate and economy are from the same scenario, please unify the names. (Rock, Joachim, Johann Heinrich von Thuenen-Institute, Federal Research Institute for Rural Areas, Forestry and Fisheries)
973	23	98	0	0	0	Figure 23-5. The identity of the gray bars should be specified. (Mach, Katharine, IPCC WGII TSU)
974	23	100	0	0	0	Figure 23-7: Please present the change in forest fire risk between the baseline and the scenario 2011-2040, as presented for the 2041-2070. The patterns (legend) for very high and very low are indistinguishable in gray scale. (UNITED STATES OF AMERICA)
975	23	101	0	0	0	Figure 23-8: Put the slide bars in a visually-comprehensive order so that the eye can attend to the information presented, i.e. on top win-lose-win the order would be forest conservation, afforestation, biofuels, low-tillcultivation, etc and on the win-win-win Green rooftops, ex situ conservation, urban tree planting, species translocatino, etc. (UNITED STATES OF AMERICA)
976	23	101	0	0	0	Figure 23-8: The caption needs to provide more information about the interpretation of Win-Lose-Win, etc. (UNITED STATES OF AMERICA)
977	23	101	0	0	0	this figure is not at all clear to me... what is the variable on the y axis? (Cassardo, Claudio, University of Torino)
978	23	101	0	0	0	Figure 23 - 8: Please explain IN THE HEADING what is the order of "win - ... - ...". This must be given with the figure (not in the text) and it is not intuitive. (Rock, Joachim, Johann Heinrich von Thuenen-Institute, Federal Research Institute for Rural Areas, Forestry and Fisheries)
979	23	101	0	0	0	Figure 23-8: The author team should further develop the caption of this figure to provide a guide for the reader in interpreting the concepts illustrated. In particular, please explain how the concepts win-lose-lose etc are organized, and the purpose of the lines emanating from each of the boxes. (Estrada, Yuka, IPCC WGII TSU)
980	23	101	0	0	0	Figure 23-8. Within the caption for this figure, the "win/lose-win/lose-win/lose" ordering should be clarified as representing "mitigation-adaptation-biodiversity." (Mach, Katharine, IPCC WGII TSU)
981	23	101	0	0	0	Figure 23-8: Please specify the ordering of the win/lose dimensions, as this can be confusing. (Mastrandrea, Michael, IPCC WGII TSU)
982	23	101	1	0	0	Figure caption should state what order the results on adaptation, mitigation and biodiversity are. Does win-lose-win mean you win on adaptation and biodiveristy but lose out on mitigation? Why is there no lose-lose-lose space on this figure? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)