

An Analysis of the Review of the IPCC 4AR WG I Report

by

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Abstract

The Intergovernmental Panel on Climate Change (IPCC) gives the impression that its Fourth Assessment Report (4AR) was thoroughly and diligently reviewed and the statements contained in the report were endorsed by a very high percentage of reviewers.

This analysis of the reviewers' comments for Working Group I (WG I) shows that the reality is rather different and that there is surprisingly little explicit support for the key notion, that humans are very likely (90% to 95%) responsible for climate change.

Part 1 – Introduction

The Fourth Assessment Report by the Intergovernmental Panel on Climate Change (IPCC 4AR) was released with much fanfare in the early months of 2007. The release began in February with the Summary for Policy Makers (SPM) from the report by Working Group 1 (WG I), titled "Climate Change 2007 - The Physical Science Basis". Over the subsequent months reports by other working groups were released.

As with all parts of the 4AR, individuals and government representatives reviewed the WG I report and the SPM. This process was undertaken for the First Order Revision (FOR) and Second Order Revision (SOR) with the review of the SOR determining the text that was released.

In a first for the IPCC, but perhaps only due to the US Freedom of Information legislation and the efforts of "hockey-stick" co-debunker Steve McIntyre, the reviewers' comments and editors' responses for the FOR and SOR of the WG I report have been made available to the public.¹ Bob Koss has counted the comments by each reviewer of the SOR and very helpfully presented those figures to McIntyre's website.

It is disturbing that the public has not been permitted to examine the comments for previous IPCC reports, or the reports by other working groups of the 4AR, when it appears likely that the global population will bear the cost of action which is based on the contents of the report.

¹ <http://ipcc-wg1.ucar.edu/wg1/Comments/wg1-commentFrameset.html>

Surely all people should be able to examine the involvement and thinking of their governments and the reviewers from their own countries because it is the people who will most likely bear the cost of any resultant actions.

Perhaps the IPCC is afraid that the review process will be exposed to independent scrutiny and that questions will be asked about the veracity of the process and the claims of significant consensus by a large number of reviewers.

As will be seen, different numbers of reviewers commented on each chapter, and this is very likely due to the different subject matter. Chapters and their titles are therefore listed in table 1

No.	Name
1	Historical Overview of Climate Change Science
2	Changes in Atmospheric Constituents in Radiative Forcing
3	Observations: Surface and Atmospheric Climate Change
4	Observations: Changes in Snow, Ice and Frozen Ground
5	Observations: Ocean Climate Change and Sea Level
6	Paleoclimate
7	Couplings between Changes in the Climate System and Biogeochemistry
8	Climate Models and their evaluation
9	Understanding and Attributing Climate Change
10	Global Climate Projections
11	Regional Climate Projections
SPM	Summary for Policy Makers
TSR	Technical Summary Report

Table 1 - Chapter numbers and titles for IPCC 4AR WG I report

Part 2 - Number of Reviewers and Comments

A total of 308 reviewers² commented on chapters of Second Order Revision (SOR), i.e. the penultimate draft, but only 32 reviewers commented on more than 3 chapters and just 5 on all 11 chapters (table 2 and figure 1).

At the other end of the scale, 143 reviewers (46%) commented on just one chapter and a further 71 (23%) on two. This would be fine if they were experts and provided numerous detailed comments but 53 of these 214 reviewers (25%) made fewer than 5 comments and 28 of them made fewer than 3. This raises the question of why they bothered to review any chapters and the question of whether they examined other chapters but had nothing to say.

chapters	1	2	3	4	5	6	7	8	9	10	11
reviewers	143	71	47	16	4	7	5	4	4	3	5

Table 2 - Number of chapters commented on by reviewers

² Koss counted 309 unique reviewers but one was duplicated under a slightly different spelling

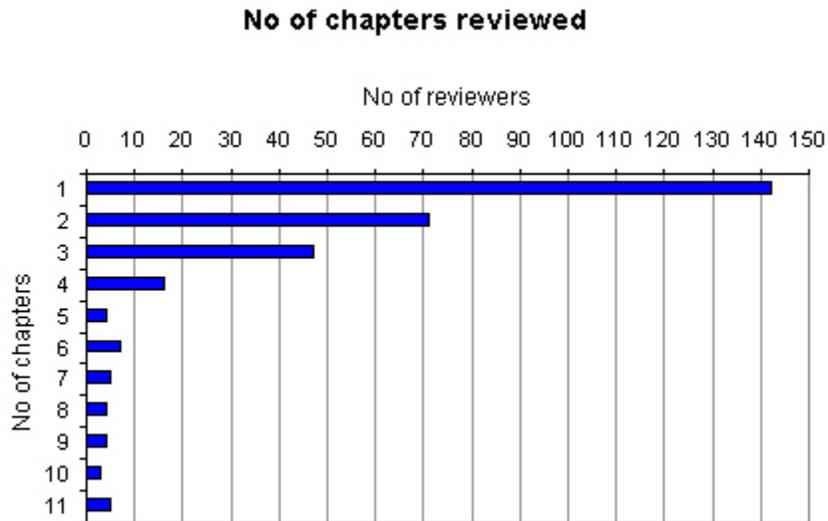


Figure 1 - Graphical representation of table 2

As noted above, the chapters of the Second Order Revision were subjected to attention by different numbers of reviewers. One hundred reviewers examined chapter 2, which dealt with changes to the atmosphere, but just 34 examined chapter 4, which discussed changes to snow, ice and frozen ground.(table 3)

Chapter	1	2	3	4	5	6	7	8	9	10	11
No. of reviewers	53	100	87	34	64	75	70	58	62	87	49

Table 3 - No. of reviewers who commented on each chapter of the Second Order Revisions

Reviewers commented on the chapter as a whole and then on each paragraph of the draft in question. Most reviewers' comments fall into one of the following categories

- praise
- correction of typographic errors (spelling and punctuation)
- correction of grammatical errors
- suggested improvements (words or phrases)
- requests for clarifications, for more precise wording or for definitions
- corrections of references or suggestions of additional references,
- other corrections or clarifications (e.g. "Not all volcanic eruptions are climate-relevant.")

Appendix 1 to this document contains some sample comments both with responses and without.

Those responses come from the editorial team for each chapter and naturally reflect the acceptance or rejection of comments as well as a host of other possible situation (eg. "text has been rewritten").

One response noted in passing was "*Rejected. McKittrick and Michaels (2004) is full of errors. There are many more papers in support of the statement than against it.*" This indicates that a consensus of papers is a major determinant of the content of the report.

In some cases comments attributed to an individual also appear under the name of a national government but the extraction of these duplicated comments would call for subjective judgment and has not been attempted here.

Not surprisingly the number of comments by each reviewer varies greatly between chapters (figure 2).

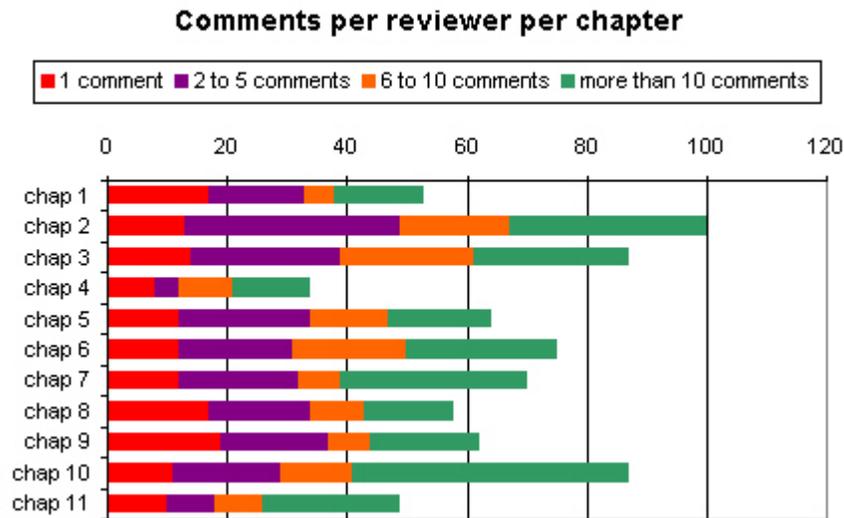


Figure 2 - No of reviewers making various numbers of comments

The number of reviewers who made just 1 comment on a chapter varied between 12.6% and 32% (i.e. almost one-third) of the reviewers that commented on that chapter. For 4 chapters fewer than 6 comments were made by more than 50% of the reviewers that did comment and for another 4 chapters the figure was between 40% and 50% (figure 3).

The number of comments per reviewer per chapter varies greatly but by simple addition we can see how many comments each reviewer made and we can gain an indication of the probable distribution of the effort put into the task of reviewing these chapters (Figure 4).

Forget any illusion of hundreds of experts diligently poring over all chapters of the report and providing extensive feedback to the editing teams. The true picture is closer to 65 reviewers for any one chapter, with about half of those not commenting on any other chapter and one quarter commenting on just one other. On top of that, about half of those reviewing this chapter made very few comments.

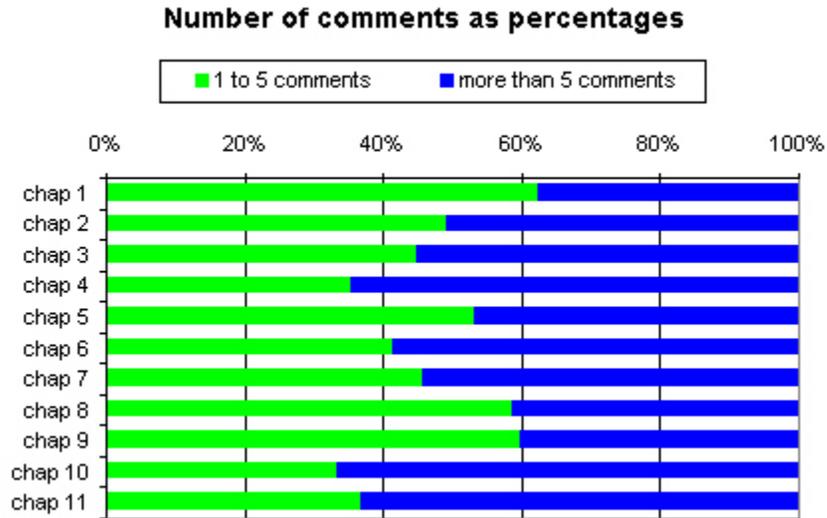


Figure 3 - Percentages of reviewers making few (<6) comments and many comments

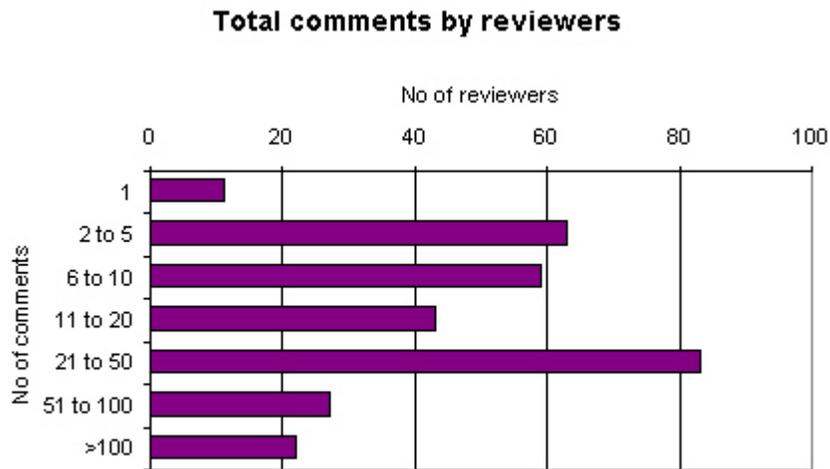


Figure 4 - Total number of comments made by reviewers

Part 3 - The contribution of government reviewers

Almost all governments see climate change as a major political issue but comments assigned to government reviewers (and denoted as "Govt. of (name)") suggest otherwise.

The review of the 11 chapters of the SOR of WG I show the names of only 22 national governments, plus the "European Commission" which was somehow granted the status of a

government. Surely the governments of the remaining 140+ countries are not as disinterested in climate change as these figures suggest.

It is possible that some individually named reviewers were working on behalf of governments but it is impossible to determine them from the information given. Conversely there are clear instances of identical comments being attributed both to an individual and to a national government, which indicates that certain processes were not diligently carried out.

From the names of the reviewers it appears that there was no review of the WG I report by a large proportion of the globe. Of the 22 named governments 11 are western and northern European countries. The Czech Republic and Hungary were the only east European countries reported. No review was undertaken by Russia and its former states, nor from any country in Africa or the Middle-east. From South America only the governments of Brazil and Chile reviewed to the report and from Asia China, India, Japan, Korea and Thailand. The three countries not mentioned thus far were Australia, Canada and the United States of America.

Countries that claim that they will suffer most from rising sea level, namely Maldives, Tuvalu and Bangladesh, had no government reviewers comment on any chapters of the report. Denmark administers Greenland, which is supposedly suffering from a retraction of glaciers, but no review appears to have been undertaken on behalf of the Danish government. Switzerland is seeing the retraction of glaciers and a rising snow line - and incidentally is the home of the IPCC - but likewise made no comments under government auspices.

As with the individual reviewers, the extent of the review by government representatives varies enormously. The number of governments whose representatives reviewed each chapter ranges from 8 to 17 (Table 4).

Chapter	1	2	3	4	5	6	7	8	9	10	11	SPM
No. reviewing Govs	8	17	11	8	10	10	11	10	8	13	10	17

Table 4 - Summary of government contribution of the review of each chapter of the WG I SOR

The government representatives of 5 countries commented on just one chapter and 13 countries (more than half) commented on less than half of the chapters. In contrast the government representatives of USA and Australia, both non-signatories to the Kyoto Agreement, commented on all 11 chapters.

Not surprisingly the USA and Australia were well represented when it came to the total number of comments, being 2nd and 3rd highest respectively, and eclipsed only by an individual reviewer. The reviewers for governments in countries in western and northern Europe made a total of 749 comments but those for the USA alone made 689 comments. Eleven countries each made a total of fewer than 15 comments for the entire WG I report. (Table 5)

Government	Ch 1	Ch 2	Ch 3	Ch 4	Ch 5	Ch 6	Ch 7	Ch 8	Ch 9	Ch 10	Ch 11	Total	No. Ch
European Commission	0	18	0	0	0	0	0	0	0	47	0	65	2
Govt. of Australia	24	36	83	2	40	37	1	23	11	72	33	362	11
Govt. of Austria	1	1	0	0	0	0	2	1	3	4	0	12	6
Govt. of Belgium	0	14	0	0	0	0	0	0	0	0	0	14	1
Govt. of Brazil	0	0	7	0	0	0	21	0	0	0	1	29	3
Govt. of Canada	0	0	0	6	0	0	2	29	0	14	0	51	4
Govt. of Chile	0	0	0	0	7	0	0	0	0	0	0	7	1
Govt. of China	2	8	7	6	3	4	3	10	0	4	5	52	10
Govt. of Czech Republic	0	0	0	0	0	0	0	0	0	0	7	7	1
Govt. of Finland	1	39	7	1	1	0	0	50	9	36	23	167	9
Govt. of France	20	2	22	0	1	6	0	3	12	16	13	95	9
Govt. of Germany	0	25	6	7	1	18	24	1	2	95	0	179	9
Govt. of Hungary	0	2	0	0	2	0	1	0	0	0	0	5	3
Govt. of Ireland	0	3	0	0	0	0	0	0	1	0	1	5	3
Govt. of Japan	0	5	2	1	0	1	0	0	0	1	0	10	5
Govt. of Netherlands	0	0	0	0	0	0	0	4	1	5	4	14	4
Govt. of Norway	0	7	0	0	0	0	0	0	0	0	0	7	1
Govt. of Korea	0	3	3	0	17	0	22	0	0	0	0	45	4
Govt. of Spain	10	4	30	0	0	53	6	1	0	0	28	132	7
Govt. of Sweden	0	0	0	1	0	6	1	0	0	2	0	10	4
Govt. of Thailand	0	0	0	0	0	4	0	0	0	0	0	4	1
Govt. of United Kingdom	4	1	14	0	8	1	0	0	0	21	0	49	6
Govt. of USA	46	85	129	50	43	99	45	43	113	18	18	689	11
TOTALS	108	253	310	74	123	229	128	165	152	335	133	2010	--

Table 5 - Number of comments by government reviewers for each chapter

Part 4 - Authors or Reviewers?

The figures shown earlier in part 2 apply to the number of reviewers as whole. These include the reviewers operating under government auspices (discussed in part 3) but also numerous reviewers who were among the team of authors for the chapters in question.

There may be legitimate reasons for a contributing author of a subsection to review other sections of the same chapter but the impression one gets is these author-reviewers were unable to raise their points within the internal communication of the IPCC authoring teams. How else does one explain that a Lead Author of chapter 2 made review comments about that same chapter or that one author made 282 comments about his only chapter or that 3 authors of chapter 11 made a total of 350 review comments on that chapter?

In total 30 author-reviewers made all of their comments about chapters that they authored

Table 6 shows the number of authors and reviewers for each chapter. The number of authors exceeds the number of reviewers for six chapters but this number increases to 8 when author-reviewers are excluded. This situation implies that most of the global experts on particular matters were part of the authoring team and that few highly qualified persons were in a position to review those chapters.

Six chapters were reviewed by fewer than 50 individuals who were not authors of that chapter, but in each case that number of reviewers might include authors of other chapters.

Chapter	Authors	Reviewers			
		Gov. Revs	Author-Revs	Other revs	Total Revs
1	36	8	4	41	53
2	54	15	6	79	100
3	81	11	12	64	87
4	57	8	2	24	34
5	68	10	12	42	64
6	51	10	6	59	75
7	78	11	8	51	70
8	88	10	9	40	58
9	56	8	7	47	62
10	94	12	11	64	87
11	59	10	6	33	49

Table 6- Number of authors and reviewers for each chapter

The total number of individual authors and reviewers of the WG I report is misleading because several individuals were authors of more than one chapter and several authors were also reviewers.

Authors who reviewed:	95	
Authors who did not review:	517	
Reviewers who were not authors:	214	(includes 23 governments)

In total 823 individuals and 22 governments contributed to the WG I report but 612 individuals were authors (or author-reviewers) and just 190 were reviewers.

Part 5 - Number of Comments and Rejections

Commenting is only part of the picture because editors could, and often did, ignore those comments.

Determining the number of rejected comments is difficult because the expressions of rejection come in many forms, the rejection may only be partial or the comments may be made irrelevant by sections of text being rewritten, deleted or restructured.

A simple analysis based on the occurrence of three key words - "rejected", "reject" and "disagree" - provides a likely minimum number of rejected comments because other words may be used. This somewhat crude analysis reveals that the minimum number of rejected comments averages 25% of all comments on the SOR of a chapter and ranges from 9.5% to 58.1% (Table 6, Figures 5 & 6).

	FIRST REVISION			SECOND REVISION		
	Total	Reject	Rej%	Total	Reject	Rej%
Chapter 1	899	154	17.1%	554	155	28.0%
Chapter 2	2732	270	9.9%	1313	254	19.4%
Chapter 3	2231	307	13.8%	1256	368	29.3%
Chapter 4	1137	64	5.6%	516	109	21.1%
Chapter 5	1204	57	4.7%	635	119	18.7%
Chapter 6	1789	252	14.1%	1112	362	32.6%
Chapter 7	1751	105	6.0%	974	113	11.6%
Chapter 8	963	179	18.6%	794	159	20.0%
Chapter 9	1436	246	17.1%	1157	672	58.1%
Chapter 10	1331	73	5.5%	1331	354	26.6%
Chapter 11	1458	99	6.8%	1647	156	9.47%
SPM	no rev	no rev	no rev	1455	372	25.6%
TSR	no rev	no rev	no rev	1333	330	24.8%

Table 7 - Summary of total comments and the likely minimum number of rejected comments. ("No rev" indicates that no review took place).

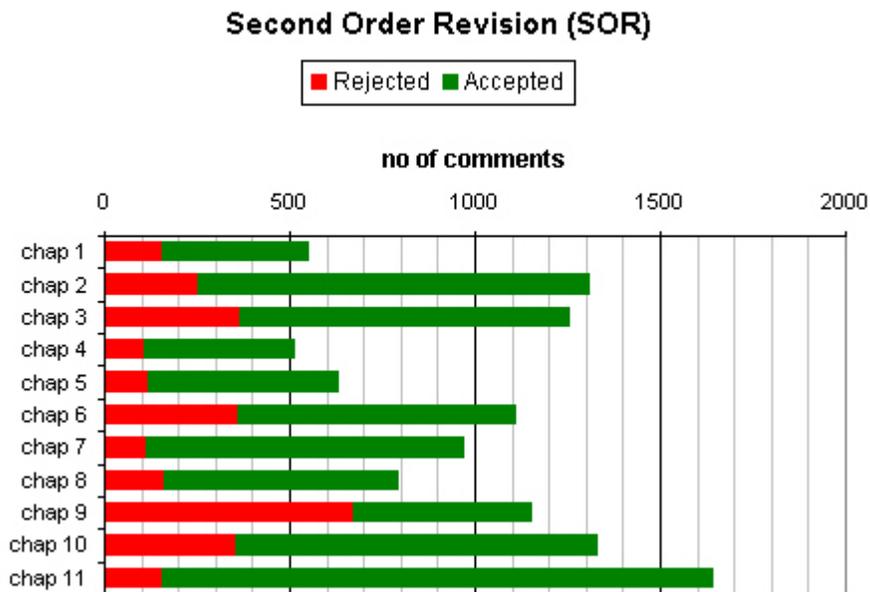


Figure 5 - Accepted and rejected comments for the SOR(based on minimum rejected)

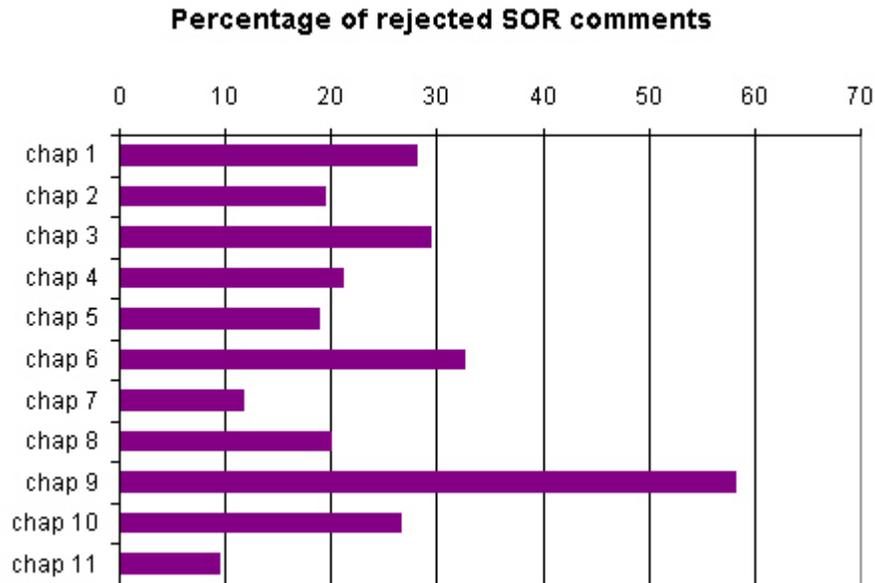


Figure 6 - percentage of rejected comments (based on minimum rejected)

The striking feature of many rejections is their dubious nature. Some responses were banal and others showed inconsistencies with other comments. Reviewers had to justify their requested change but the responding editors appear to have been under no such obligation.

One reviewer said that "best estimate" should more correctly be "most recent estimate" but the editors changed the text to "current best estimate". Reviewers were sometimes flatly told they were wrong but no reasons or incontrovertible references were provided.

Another said that one heat wave did not make a trend but the editors rejected this by claiming they used that heat wave as an example. Too bad if the passage was taken out of context and that heat wave being interpreted as due to climate change when contradictory evidence and expert statements at that time said otherwise.

In other cases reviewers tried to dilute the certainty being expressed and they often provided supporting evidence, but their comments were often flatly rejected.

Some comments were rejected on the basis of a lack of space and it seems incredible that space should have been a constraining factor on such an important document.

Reviewers would cite references but be told that a greater number of references supported an alternative argument. Reviewers would make a brief statement of correction but be told of just one paper that contradicted that claim. In at least one response the editors made referred only to a document that has not been subjected to peer-review.

The attitude of the editors seems very much to be that simple corrections will be accepted, requests for improved clarity be tolerated but the assertions and interpretations that appear in the text were to be defended against any challenge.

Part 6 - On the Attribution of Climate Change

Chapter 9 is the single most important chapter of the entire report because it is where the IPCC states, "it is very highly likely that greenhouse gas forcing has been the dominant cause of the observed global warming over the last 50 years".

The IPCC leads us to believe that this statement is supported by a large number of reviewers. We often hear reference to 2,500 scientists supporting the IPCC's findings but that number supposedly includes about 1,500 acting as chapter editors. Earlier it was shown that a total of 308 reviewers, individuals or government appointees, reviewed parts of the WG I report but even that figure is far higher than the number of reviewers for chapter 9.

In fact only 62 reviewers commented on this chapter. Nineteen reviewers made just 1 comment and 18 made between 2 and 5 comments, and that total of 37 reviewers is 60% of the total. Just 10 reviewers made more than 20 comments for this, the most important chapter of the entire report, and yet some of these were typographical errors that were missed by many reviewers.

The total of 62 reviewers is comprised of 8 government reviewers (designated as "Govt of ..."), 37 reviewers with potential vested interests and 17 reviewers who appear to be independent.

Those 8 government reviewers cannot be considered to be impartial. All but 2 of the 8 governments signed the Kyoto Accord several years ago and even those two signed the Kyoto Agreement and therefore all of the 8 governments accepted the claim that anthropogenic emissions of carbon dioxide have caused warming. It is difficult to imagine any reviewers acting under the auspices of those governments would be highly critical of a claim that their governments already accept.

As a point of interest, among those 8 governments only the two non-signatories to Kyoto, the USA and Australia, were outside Europe. Despite its well-publicised beliefs about climate change the government of the United Kingdom was not among those eight, nor were the governments of any countries that claim to be at risk from rising seas.

The 37 reviewers with vested interests are comprised of 7 who were authors of this same chapter and incidentally were all authors or co-authors of cited papers, 19 others whose papers were also cited, 5 more who were authors of other chapters and 4 who were otherwise involved in the IPCC's process by being overall editors, SPM authors, authors of additional material or working as technical support staff.

Research into the 17 reviewers who appear to be independent revealed that several were far from impartial. Seven work at, or recently moved from, government and semi-government organisations that very likely receive research funding in accordance with the beliefs of those governments. These included reviewers who worked at GISS (USA), KNMI (The Netherlands), CSIRO and Bureau of Meteorology (Australia), British Antarctic Survey and Hadley Centre (Britain), and Meteo France.

According to a posting on the Internet by another reviewer, he was acting on behalf of a government but recorded as an individual rather than a government reviewer. Of the remaining 9 one appears to have a commercial or other vested interest in the claim of a significant man-made influence on climate and another was an author of chapters in one or more previous IPCC reports.

Subtract these 10 reviewers with potential vested interests from the initial 17 and that leaves just 7 who may have been independent and impartial

The full list of chapter 9 reviewers and how they fit the above groups is shown in Appendix 2.

A total of 1158 comments were made but almost 60% came from just two sources. One individual reviewer made 572 comments (49.4% of the total) and the government of the United States of America made 113 comments (9.8%), but many comments by the US government duplicated the 32 comments made by an individual reviewer.

The majority of those 572 comments from one reviewer appear to strike at four contentious issues. First there is the corruption of the generic meaning of "climate change" into "man-made climate change"; second the matter of whether urban heat islands, which the reviewer often refers to as the proximity of measuring equipment to human induced heat, are distorting the temperature record; third the discrepancy between tropospheric temperature changes and surface; and fourth the impact of El Nino events on any trend.

The IPCC editing team rejects the above points claiming firstly no distortion in the meaning of "climate change", contradicted of course by the IPCC's name including the words "climate change" and yet being focused on a human influence on climate. Secondly it argues that there is no evidence that human induced outputs of heat have corrupted the data and on the third point it refers to papers that dispute the tropospheric temperature record but on both matters ignores the absence of any verification of the accuracy of near-surface temperature records. The IPCC consistently claims that El Nino events are internal to the climate system but seem to forget that their occurrence in the tropics makes them come under the influence of solar radiation and that subsea volcanic activity may be contributing.

On many occasions the IPCC claimed a numerical superiority of papers that supported its line of argument and referred to comments in the Third Assessment Report (TAR) of 2001. The clear implications were that a consensus of papers is one determining factor and that whatever was said in the TAR must be correct, although one suspects that the TAR was likewise disputed by reviewers.

The most risible of the IPCC's responses is "*Rejected. The ability of models to simulate the temperature variations indicates that any missing natural forcings have little impact.*" Apparently the IPCC believes that if the output of the models is approximately correct then the internal workings of the model must likewise be correct. Perhaps the IPC is unaware that if a model based on a factor that is driven by temperature rather than drives it, that model will be false but will probably produce output that matches historical data.

It is clear that the 572 comments by this one reviewer were not frivolous but addressed some very significant core issues, so one wonders why other reviewers did not make similar comments.

Of the remaining comments, and discounting the duplication under the name of the United States government, 99 of 554 comments were rejected, which is still more than 1 in 6.

Reverting to the 7 reviewers who appear to be independent and impartial, it is disappointing to see that 5 made just one comment on the entire chapter and for two of those it was their only comment for the entire 11-chapter the report.

Chapter 9 of the WG I report contained the fundamental contention of a significant human influence on climate. This claim forms the basis of chapters 10 and 11, which deal with global and regional climate projections respectively, and the subsequent WG II and WG III reports, but if that claim is wrong then those subsequent have no validity.

Forget those other chapters and reports, the entire IPCC thesis stands or falls on the contents of chapter 9.

The IPCC gives the impression of a very substantial number of reviewers agreeing with chapter 9's claim of a significant human influence on climate. That is a false impression because just 5 reviewers gave explicit support to the notion.

The reviewers in question are as follows:

- (a) a researcher with no obvious affiliations but who made just this one comment for the entire 11 chapters of the report (which suggests that the so-called evidence may not have been examined in detail).
- (b) a reviewer who was also an author of a scientific paper cited by this chapter
- (c) a reviewer whose has a background in the contentious field of climate modelling and has strong links to a research department of a government meteorological authority that has likely been funded for projects which assume a human influence on climate,
- (d) a government that has signed the Kyoto Protocol and that made just one comment when reviewing this chapter,
- (e) a reviewer who was also an author of an earlier chapter of the WG I report

(Evaluating the tone of comments is inevitably subjective so the comments that I deemed to be supportive of the entire chapter or parts thereof are listed in Appendix 3.)

With the credibility and impartiality of each of the above reviewers being under question the combined endorsement for the claim of a significant human influence on climate is basically negligible.

The IPCC leads us to believe that over 600 impartial reviewers diligently examined chapter 9 and a very high proportion agreed with its findings. It is difficult to see how this impression could be much further from the truth - 7 reviewers who were probably impartial, only 2 of whom made more than one comment; just 5 reviewers endorsed the chapter but most of those had potential vested interests.

Part 7 - A Final Word

The IPCC states clearly that it undertakes no research of its own but merely relies on published papers for its information. A team of editors assesses those papers and writes the drafts of the various report chapters. While minor corrections are welcomed the overall assessment is strongly defended against challenges.

On the surface this looks not unreasonable but scratch a little deeper and the self-sustaining nature of the claim of a human influence on warming becomes visible.

Unlike other high-profile scientific fields, these reports by the IPCC are almost entirely responsible for determining the direction of climatology and how the research funding will be spent.

The IPCC's Third Assessment Report (TAR) of 2001 showed that 9 of 11 climate factors were poorly understood but despite this it claimed that humans were responsible for rising temperatures.

As a consequence of the TAR the majority of funding for climatology research went to projects that assumed a human influence on climate.

Not surprisingly this caused the papers taking this position to significantly out-number the papers that rejected this hypothesis. But as the responses to reviewers' comments show, the number of papers supporting a certain argument is a critical factor in determining the content of the IPCC reports.

It is not merely the weight of numbers that tilts the balance but also the leanings of the editors. The content of the reports rests with the teams of editors but if those editors are actively engaged in research then it is likely to be on projects which assume a human influence on climate and this will make those editors susceptible to being predisposed to view climate in that light.

There is not the evidence to claim deliberate bias but logically the "anthropogenic warming" argument will be very familiar to many editors and the tendency will be that papers following that line will receive less intense scrutiny than papers that don't only challenge that argument but also challenge the editors' own beliefs. If an editor took the position that the human influence on climate is negligible or non-existent on anything but a small and localised scale then that person's research opportunities are likely to be few.

The same potential conflict of interest arises with the reviewers, many of whom are authors of papers related to climatology and are quite possibly still involved in research projects. The reviewers have the added problem that the IPCC practice is to make all reviewers' comments available to other reviewers. Reviewers cannot hide behind some kind of editorial team "group think" but are exposed to individual scrutiny and that can put reputations and research opportunities at even greater risk.

The problems continue into the authorship of these reports. According to IPCC documents, scientists are nominated by governments or explicitly invited by scientists who were already

associated with the IPCC. What a wonderful way to position scientists who support a government agenda on climate and then fill out the IPCC with like-minded individuals.

The bigger picture is that research funding indirectly determines the content of the IPCC assessment reports, and those assessment reports play a very significant role in determining the direction and funding of the research.

Who would be a reviewer when many chapter authors will be likely to defend the beliefs and reputations they have established via research projects funded by government money on the supposition that anthropogenic global warming is a fact? Few researchers who are funded by the anthropogenic warming gravy-train are likely to review IPCC chapters with the intent of identifying flaws only those sceptical of the claims, and have little to lose in the way of reputation or funding, will make the effort. Several recognised sceptics of man-made warming failed to take part in the review but who can blame them when the exercise is so evidently futile.

In the long term this perpetual and increasing marginalising of contrary viewpoints is extremely detrimental to the science because it will produce a supposed scientific "truth" based on little more than the emphasis of the funding and the domination of certain opinions.

Bio

John McLean is climate data analyst with an extensive background in the IT industry. He became interested in the question of climate change when told of evidence that directly refuted the frequent claim that recent temperatures were unprecedented. He lives in Melbourne, Australia, and is a member of both the "Climate Sceptics" and "New Zealand Climate Science Coalition" Internet discussion groups.

Key Points

The review of the Working Group 1 report was far less intense than the IPCC has implied.

- 308 reviewers examined the chapters of the Second Order Revision (i.e. penultimate draft) of the Working Group 1 report, with the average number of reviewers per chapter being 67 (minimum 34, maximum 100).
- 214 reviewers (69%) commented on two chapters or less and 60 reviewers averaged fewer than 3 comments for all chapters they examined
- Only 5 reviewers, specifically 3 individual reviewers and 2 government reviewers, commented on all chapters and just 49 reviewers (16%) made more than 50 comments in total

Only 22 governments had designated reviewers but 5 of these commented on only one chapter and 5 averaged less than 3 comments per chapter. The United States of America and Australia, both non-signatories to the Kyoto Agreement, commented on all 5 chapters and made the greatest number of comments.

On average the editors rejected at least 25% of those reviewers' comments for any chapter but many of those rejections are contentious.

The critical chapter, that which attributed recent warming to human activity, was reviewed by 54 individual and 8 government representatives but almost 1/3rd of reviewers made just one comment.

- 37 of the 54 had a vested interest in the report, as editors or having papers cited
- 26 authored or co-authored papers cited in the final draft
- 10 reviewers explicitly mentioned their own papers in their review

Just 7 reviewers of that chapter appear to be independent and impartial but 5 of those made just one comment for the entire chapter.

Just 5 reviewers explicitly endorsed the chapter in which it was claimed that humans have a significant influence on climate but not one of those 5 has impeccable credibility.

There is scant evidence of any support for the IPCC's contention that anthropogenic emissions of carbon dioxide have caused warming.

The IPCC reports appear to be largely based on a consensus of scientific papers, but those papers are the product of research for which the funding is strongly influenced by previous IPCC reports. This makes the claim of a human influence self-perpetuating and a corruption of the normal scientific process.

Appendix 1

Sample review comments and responses

This appendix contains just some of the less banal comments (i.e. minor corrections or praise to a chapter), which arbitrarily come from chapters 1, 2, 3, 9 and 10, in order to provide some impression of the types of comments and responses..

Comments are shown here as they appeared (i.e. without spelling or grammar corrections). They are shown in full unless otherwise noted. Where reviewers' comments are shown without a response the reference number is provided but where responses are included no number is shown. Where I have appended comments for this document those comments are indicated in **bold** and within [and].

Part (a) - Sample Reviewers' Comments (without responses)

- 1.01 "Solar radiation is the driving force of the climate system." This could be taken out of context. Consider changing "the driving force" to "a driving force. (1-435)
- 1.02 Understanding will necessarily have "evolved" since the TAR, but more to the point has it markedly improved? (2-424)
- 1.03 "better understood" - I would say that the trend in methane is not better understood - and indeed is a bit of a mystery. (2-244)
- 1.04 I would encourage IPCC to consider having only one solar physicist on the lead author team of such an important chapter. In particular since the conclusion of this section about solar forcing hangs on one single paper in which J. Lean is a co-author. I find that this paper, which certainly can be correct, is given too much weight. [*part only*] (2-901) [**J Lean was a Lead Author of the relevant chapter**]
- 1.05 DELETE THE ENTIRE MATERIAL BEGINNING WITH "IN ADDITION" as all of this is highly contentious has all sorts of implicit ethical and moral judgments which you have not even begun to address, and goes way beyond the core science, which is the only thing the WG1 should deal with. (2-1026)
- 1.06 As written it implies 100% attribution, which is misleading, since the idea that all climate change is attributable to GHG forcing is an extreme position held by few if any experts. Insert "partially" after the word "been" and before "attributed". This suggestion was made in the FOD review and ignored. It is hereby repeated, for the same reason: the present wording is deliberately misleading. (3-223)
- 1.07 This conclusion comes out of nowhere! After reading the past two-to-three pages about differing precipitation, soil moisture, and stream flow trends all over the place, I was quite surprised to read "The global increase in both sever drought and large floods suggest that

hydrologic conditions have become more extreme." Apparently my definition of "global" is quite different from yours. (3-421)

- 1.08 You MUST insert here a proper Figure showing the radiosonde records, preferably those from Figure 9 of the paper of Thorne et al (2005). Figure 3.4.2 is deliberately designed to conceal the true facts about both the radiosonde and the MSU records. The pretence that these three records are virtually identical is a plain lie. *[part only]* (3-467)
- 1.09 This is pure speculation. The sondes in these studies have not been corrected for instances where spurious warming occurs as shown in for example in Christy and Norris 2004, Christy and Spencer (2005) and the other papers to appear soon. (3-543)
- 1.10 1998 is quoted here as the warmest year for the global mean, without qualification. This is at odds with page 3-3, lines 15 to 19, which point out that NCDC and GISS have 2005 warmer than 1998, in contrast to the CRU/UKMO estimate. (3-702)
- 1.11 You claim that Turner et al. (2005) found '... a cooling over much of the rest of the continent'. But that paper was only concerned with station data and there are only two stations with long records in the interior of the Antarctic. In that paper we were careful to point out that few of the annual temperature changes around East Antarctic were statistically significant. Only South Pole has a statistically significant cooling in the annual data. (3-728)
- 1.12 Seems odd to say that the figure is not shown because it is not reliable, yet then discuss it for several more sentences. Why should we conclude that the discussion is reliable? (3-877)
- 1.13 How does a study of only a half century of data distinguish interdecadal (e.g.30 year and longer timescale) variability in one phenomenon from other potentially related or unrelated trends in other phenomena. Implausible claims such as this, especially those which rest on one study of half a century of reanalysis data, should not serve as the basis for conclusions in an assessment report. (3-797)
- 1.14 I found this discussion of "selection bias" confusing. "Fingerprinting" results in a different kind of selection bias, in that only those patterns predicted by the model responses are looked for. One wouldn't have noticed the ozone hole if one followed this kind of program religiously. *[part only]* (9-193)
- 1.15 Please explain for the reader how to understand the apparently high confidence in detection in certain regions where there is very little data over the full 20th century as shown in figure 9.4.2. How is it that you can divide the globe so finely when you have only a few data points in some of these regions over the full 20th century? *[part only]* (9-591)
- 1.16 You may need to suitably denigrate our work to justify your conclusion, but you could mention that at least some people strongly disagree with your claims! (10-987)

Part(b) - Reviewers' Comments and Editors' Responses

- 2.01 REV: Delete "of the risk of" The study is to find out IF there is a risk at all. You should not assume that there IS a risk.
RES: *Rejected: we think there is no ambiguity in the statement as it is.*
- 2.02 REV: Suggest deleting the two sentences "The glass walls....of the planet" is unnecessary and potentially confusing to most non-expert readers.
RES: *Rejected . These facts explain the name of the greenhouse effect.*
- 2.03 REV: Sentence should read: "carbon dioxide or water vapor has only a small direct..."
RES: *Noted but not taken into account*
- 2.04 REV: Is the "best estimate" a good choice of words? If I read the text I would rather say "most recent estimates".
RES: *Accepted. Changed to 'current best estimate'. [but this retains the questioned use of the word "best"]*
- 2.05 REV: This paragraph is too generalised - and does not apply to large land areas in the Southern Hemisphere.
RES: *Rejected. Nor does it refer to general land areas in the southern hemisphere. It does refer to South America.*
- 2.06 REV: The title is not corresponding to the content. It has to be replaced
RES: *Noted. It doesn't have to.*
- 2.07 REV: This statement is NOT TRUE. Their plot shows a flattening of the number within the last two 5-year periods. [*part only*]
RES: *Noted. Changes made.*
- 2.08 REV: Probably overstates the certainty of their conclusions.
RES: *Noted. Text retained as we believe it is correct*
- 2.09 REV: The references to Trenberth et al. (2000) and Trenberth and Stepaniak (2003a,b) are not necessary as this basic information on the Hadley Circulation is dealt with in text books and numerous other journal publications.
RES: *Modified. This is not true: none of this is in text books anywhere!!!!*
- 2.10 REV: The text here states that GHG forcing is smaller than the indirect effect of aerosol - this therefore implies that the net anthropogenic forcing is negative, which is at odds with the statement on pg 67, ln 17, that humans have very likely exerted a net warming influence on climate.
RES: *Accepted, paragraph is modified.*
- 2.11 REV: Insert after "corrections", " But all of them show a zero temperature trend between 1978 and 1998".
RES: *Rejected - no reason given for suggested change The reviewer is taking a biased stance by deliberately selecting a minimum-trend period. [Are the editors taking a biased or unbiased stance?]*

- 2.12 REV: Replace "lead to important" by "suggest"
RES: *Agree wording is not perfect. Replacing "lead to" with "have resulted in"*
- 2.13 REV: Replace "are shown to " by "may".
RES: *Wording changed to "are projected to" [which is quite different to "may"]*
- 2.14 REV: Most of the evidence suggests the opposite—increased heating at the surface relative to the troposphere. There is some suggestion that the trends in the troposphere may be underestimated (Sherwood et al.) but the corrections have not been made and thus the ultimate outcome is unknown.
RES: *Rejected. We are working with the CCSP report. [The CCSP report was not peer-reviewed]*
- 2.15 REV: If the data isn't good enough to conclude anything from 1979 to the present, how can we really conclude anything from 1958 to the present?
RES: *Rejected. Over longer periods there can be a smaller influence of error. [But is this true in this case?]*
- 2.16 REV: I find that it is "very likely that greenhouse gas forcing has been the dominant cause" difficult to reconcile with "it is highly likely that warming... cannot be explained without external forcing".
RES: *Rejected. The second statement is less specific so should have a higher confidence associated with it.*
- 2.17 REV: The example doesn't really help. Perhaps say, "Extreme events can occur in an unchanging climate."
RES: *The comment indicates that the reviewer does not really understand the statistical point that is being made here....*
- 2.18 REV: One "heat wave" does not make a "trend"
RES: *Rejected. The European heat wave is just a single example and this is clear in the current text.*
- 2.19 REV: I find the statements in the second and third (non title) rows hard to reconcile. It seems to suggest that if greenhouse gas forcing has been involved then it has to be dominant, i.e. there is no room for it to be a minor contributor.
RES: *Noted. We don't quite see the difficulty. The assessment is that greenhouse gas has been the dominant contributor.*
- 2.20 REV: Please be precise on whether the net RF is LIKELY or VERY LIKELY positive since 1750. Whereas line 17 states VERY LIKELY in terms of warming (which requires at least a net positive RF), the statement in line 21 says that "However, the net RF for all anthropogenic drivers taken together is LIKELY to be positive". Please be consistent.
RES: *Accepted, text reworded, it is very likely*

Appendix 2

Reviewers of Chapter 9

also authors of chapter 9 (all cited)

Bette Otto-Bliesner
Daithi Stone
Danny Harvey
David Sexton
Gareth S. Jones
Peter Thorne
Ronald J Stouffer

also cited authors

Adrian Simmons
Dave Rowell
David Parker
David Rind
Hermann Held
Isaac Held
J. David Neelin
James Annan
Joanna Haigh
Jürg Luterbacher
Masato Sugi
Matthew Collins
Michael Mann
Olivier Boucher
P.C.D. Milly
Peter Stone
Richard Wood
Seita Emori
Stefan Rahmstorf

also authors of other chapters of WG I report

Brian Soden	chaps 3, 8
Fons (or Alphonse) Baede	chap 1
Michael MacCracken	chap 1
Ronald Prinn	chap 2
Sandrine Bony	chap 8

also directly involved with the creation of the IPCC report

Lenny Bernstein	author SPM WG III
Martin Manning	Head, Technical Support Unit, IPCC WG I
Melinda Marquis	Technical Support Unit, IPCC WG I
Susan Solomon	co-chair IPCC Working Group I
David Wratt & David Fahey	responsible for FAQs (see * below)
WG1 TSU	Technical Support Unit, IPCC WG I

(*Wratt was also part of the board that helped select the authors and "with guiding the initial outline of the report", according to the acknowledgements in the preface to the IPCC WG I report)

Government reviewers

Govt. of Australia
Govt. of Austria
Govt. of Finland
Govt. of France
Govt. of Germany
Govt. of Ireland
Govt. of Netherlands
Govt. of United States of America

**from government and semi-government organisations
(usually researchers)**

Andrew Lacis	GISS (USA)
Bart Van den Hurk	KNMI (The Netherlands)
Kevin Walsh	CSIRO (Australia)
Michael Manton	Bureau of Meteorology (Australia)
Pascale Delecluse	Meteo France
Ruth McDonald	Hadley Centre (UK)
Steve Harangozo	British Antarctic Survey (UK)

others with questionable impartiality

Paul Baer	possible commercial interest
Haroon Kheshgi	author of previous IPCC reports
Tiziano Colombo	reviewer for Italian government

... which leaves the following who might be independent

Expédit Wilfrid Vissin
Jeff Kueter
Martin Lewitt
Ross McKittrick
Tianjun Zhou
Vincent Gray
Wilmer Anderson

Appendix 3

Review comments for chapter 9 that are supportive of the chapter authors' claims

Introduction:

Any assessment of the degree of support expressed by reviewers is inevitably subjective and so the individual comments are displayed here for the reader's interpretation. Attention is also drawn to the footnote on page 3 that shows the Internet URL for accessing all reviewers' comments for all chapters of the Working Group I report.

Several reviewers were also authors of this or other chapters of the WG I report. This can be one of three distinct roles, namely co-ordinating lead authors, lead authors and contributing authors. Contributing authors will generally have dealt with very specific sections of the chapter but we have no details of the authors for each section and there is the question of whether authors can truly be impartial when the chapter has such a strident focus on one cause of climate change.

English is not their mother tongue of some of these reviewers so lapses in spelling and grammar should be ignored.

Part (a) - Support for the entire chapter

Reviewer - Expédit Wilfrid VISSIN

Status - *This was Vissin's only comment for the entire 11-chapter report*

This chapter is interesting, because it clearly presents all the factors being able to explain the warming current and future one of the ground leading to the climatic change. From my new reading of this chapter, it comes out that my remarks its taken into account. The figures are improved of same as some results. The illisibles figures are removed. Nuances are brought to avoid easy assertions. Sight the current results, this chapter can be validated. Congratulation with the members of group I

Reviewer - Fons Baede

Status - *Author of chapter 1 of the report*

Chapter 9 SOD has improved considerably and is very readable and informative

Reviewer - Govt. of Ireland

Status - *The government of Ireland signed the Kyoto Accord several years ago and therefore accept the claim the humans have had significant influence on climate.*

This is a comprehensive description of the difficult problem of attribution of changes in climate to a range of possible causes. It is difficult to reach certain conclusions, but the report describes a careful, systematic process to arrive at estimates of the probability that various changes are due to anthropogenic influences.

We believe that the conclusions reached are the best possible at the current state of knowledge. The conclusions are stated in a moderate manner, with due attention to the inevitable uncertainties. The range of literature surveyed is encyclopedic. The writing of the report is clear and unambiguous, if also somewhat prolix.

Reviewer - Michael Manton

Status - *recently moved from an organisation receiving government funding biased towards a significant human influence on climate.*

This chapter is almost a text book; it is very informative but somewhat more than an assessment of the state of knowledge. ...

Reviewer - J. David Neelin

Status - *author of paper cited by this chapter*

This is a very nice chapter. Besides a few small technical comments, I have one overall comment regarding the coordination with Chapter 4.

Part (b) Praise for sections of the chapter

Reviewer - Fons Baede (see also above)

Status - *author of chapter 1 of the report*

A very well written introduction to the chapter!
and...

Para 9.7: this is a welcome and well written addition to Ch 9!

Reviewer - Kevin Walsh

Status - *until recently was employed by an organisation receiving government funding and biased towards a significant human influence on climate*

Section 9.5.3.6. Good section on a controversial topic.

Reviewer - David Sexton

Status - *an author of this chapter*

section # 9.6 I think reads pretty well for the bits I understand.

Reviewer - Matthew Collins

Status - *cited author*

The paragraph above is one of the clearest explanations I have seen of the role of the climate state in influencing the climate sensitivity. The last sentence that this approach "circumvents the problem of feedbacks being dependent on the climate state" is perhaps a little over-ambitious though. ...

Reviewer - Govt. of United States of America

Status - *independent ??*

The summary is excellent. Suggest that it lead the section, rather than trail the section. This is true for all the major summaries in the Chapter 9. ...