

Panel Response to CRM Comments

INTERIM Response

July 12, 2008

This document contains the Response of the CRM Review Panel to Comments on the Panel's Report. The Comments were communicated to the Panel Chair by V. Ramaswamy, through A. Busalacchi, on July 3, 2008. The Comments were then forwarded to all members of the Panel, and the Panel's Response has been drafted based on input from several Panel members.

In response to the Comments, a few minor revisions have been made to the Report. The revised Report is being sent as a separate document.

A problem with the Review in Princeton was that the presentations were overwhelmingly focused on scientific direction rather than programmatic direction, while the Panel focused mainly programmatic issues. Some of the programmatic information that has now been provided in the Comments would have been appropriate for presentation at the Review.

Starting on the next page, we provide a verbatim copy of the Comments, with our responses provided in *red italics*. We have not written detailed responses to all comments.

CRM Initial Responses to comments in the REVIEW REPORT

We thank the Panel for their time and energy spent in performing the CRM review. We appreciate very much the comments prepared by the Panel and commend them for their in-depth review. We feel they have given us a fair and balanced report which covers the scope of the CRM subjects very well.

In reading through the Comments, we find that there are points that need clarification or revision, based on the presentations made at the Review. We hope the Panel will take these into consideration and adjudicate according to the merits.

1. The current draft review misstates the relationship between the GOLD and MOM ocean model development efforts at GFDL [Executive Summary (p. 4), the description of Panel 1b (p. 15), and in the recommendations under Panel 3b, A (p. 30)]. GOLD is the successor to MOM (and the other ocean models with developers at GFDL), and will include every major capability currently available in MOM. The final version of MOM is being publicly released in the summer of 2008 (it has already been essentially frozen internally), and ocean model development efforts at GFDL henceforth will be via the GOLD code-base. As such the statement (p. 4), that “there is no Strategic Plan only an expectation that GFDL will continue with both GOLD and MOM for the foreseeable future, because neither performs well in all situations” is not correct.

Thanks for the clarification. It was not clear from the presentation that GOLD is essentially a code base framework in which to run either MOM or HIM. This is the source of confusion, not continued support for MOM. Revisions to the Executive Summary and elsewhere reflect our improved understanding of this point.

The cause of this confusion perhaps arises from the statement (made at the meeting) that GFDL will continue to support users of MOM for the time-being, even after development of MOM has ceased. There are numerous projects, both within NOAA and outside, that use the MOM code base. It would be disruptive to insist that every one of them cease immediately and pick up a new ocean modeling code base. In the same way that there are still some on-going projects using MOM2 (vintage 1995) and MOM3 (vintage 2000), it is only natural to expect there to be projects that will continue to use MOM4 (vintage 2004). Importantly, these include the highly successful CM2.1 coupled model used in AR4. The fact that there will continue to be MOM4 users, and that they will be supported, is not an indication of a “potentially wasteful” “parallel development of two ocean models at GFDL” (p. 30).

There seem to be questions about NCEP’s commitment to MOM vis-a-vis HYCOM. NCEP supports the MOM effort in its forecast model, and there are internal NCEP resources working with GFDL on MOM for the upgraded CFS. The HYCOM effort is directed (with a large community effort) at the real time ocean forecast requirements. The ocean modeling efforts at NCEP and GFDL are each important, working for the requirements and scientific issues/products that each institution is trying to address/produce, and should not be set up as one versus the other.

Agreed, they should not be setup one versus the other, but they are very likely to become so, given that the panel received no indication that GFDL was part of this “large community

effort”. Rather the Panel was told that HYCOM was chosen solely because of its companion data assimilation package, even though data assimilation is also a GFDL activity.

2. Under Panel 1.B Findings, the draft review states that “the ocean carbon modeling at GFDL suffers from a ‘not invented here’ syndrome, in which science and algorithms developed in the larger community filter into the models more slowly than they should” (p. 15). The phrase in this sentence seems to suggest a particular motivation for GFDL to be limited or not being more rapid to adopt certain ideas about ocean carbon modeling, without being specific. It is too vague to be useful, in our opinion. There may very well be instances when GFDL may have been slow to adopt innovations, but a more likely explanation, consistent with other statements in the review, is that this is due to a lack of human resources. The executive summary makes a stronger statement about ocean models in general, with the sentence “Science and algorithms developed in the larger community filter into the GFDL ocean models more slowly than they should. (p. 4)”. The only corresponding statement in the the body of the review refers specifically to “ocean carbon modeling efforts at GFDL”. With GFDL’s 35-year effort at supporting physical community ocean modeling, including numerous examples of innovations that were initially developed elsewhere being adopted within GFDL ocean models, such a broad statement is rather surprising. Was this statement in the executive summary intended to cover all ocean model development efforts at GFDL, or was it intended to be more limited in scope? Are there specific examples that could be cited somewhere in the review?

Unfortunately, the presentations rarely identified or addressed any problems or issues. The Panel’s concerns in this area come mainly from the backgrounds and experience of individual panel members.

For information, GFDL’s GCM with Ocean Biogeochemistry has participated, along with models from other centers, in at least 4 efforts over the last 4 years to intercompare and improve the models, including Marjy Friedrichs’ Ecological Testbed Intercomparison Project, Mary Elena Carr’s Primary Production Intercomparison Project, various JGOFS/OCB dialogs on the standardization of mineral ballasting and other parameterizations in ecological models, and the UK AMEMR ecological skill assessment project to standardize the quantification of error in marine biogeochemical and ecological models.

Participation in intercomparisons is healthy, but does not equate to cross-fertilization in the course of model development.

3. On p. 15, it is stated that “GFDL scientists participated in two Climate Process Teams combining theory, observation and modeling to study (a) the impact of the Mediterranean outflow on the circulation of the North Atlantic and (b) Southern Ocean carbon cycling.” The two ocean CPTs that are nearing completion examined (a) the representation of entraining dense overflows in ocean climate models and (b) eddy/mixed-layer interactions, with both CPTs exploring the impacts of these processes on climate relevant parts of the ocean’s circulation and thermal structure. There is an additional CPT on Southern Ocean carbon cycling that has started within the past year, but it is too early to expect results from that team.

It is unfortunate that this Southern Ocean Activity is also called a CPT, even though fundamental different from the original CLIVAR CPTs. Some minor edits to the report now reflect this.

4. p. 22, first bulleted Finding: “GFDL operates, primarily, as a quasi-independent entity, and presents its past successes in support of maintaining the status quo.” GFDL is no more “quasi-independent” than other leading laboratories, collaborating, for example, with CCSM and other national/international modeling efforts such as the Model Intercomparison Projects (‘MIPs’). GFDL’s activities and progress are overseen by OAR and CPO. “Status quo” appears to be at odds with the marked progress in recent years in model development, testing and applications, the significant and acclaimed contributions to the latest IPCC, WMO/UNEP and CCSP assessments, and the continued research advancements (e.g., newer model developments with increased realism for applications to IPCC AR5 issues, decadal predictability research, high-spatial resolution modeling of the atmosphere and oceans), as indeed recognized elsewhere in the Review.

“Status quo” refers to the quasi independence, not to a static model. We have reworded the text of the Report slightly to clarify. The issue is quasi-independence within NOAA, which, of course, other NOAA labs would also be expected to strive for.

5. p. 22, 3rd bulleted Finding: the statement here is significantly different from p. 28, 2nd last para., 3rd sent.

We see no inconsistency.

6. p. 22, 4th bulleted Finding: One of the slides presented articulated the vision of GFDL viz., be a world leader in climate AND ESM development (see slide attached). There is no “deliberative choice by management” to not engage in ESM activity and not strive to be a world leader.

The Panel’s statement is based on its evaluation of the sum of the information presented at the Review.

7. p. 5, 2nd para: “The CFSRR needs an External Advisory Panel.” The CFSRR does have an external CFSRR Science Advisory Board. A record of the first meeting is attached. The Advisory Board is chaired by Jeff Anderson. Half of its members are from various NOAA agencies. The other half is from universities and includes ECMWF. In addition, CPC (as a primary user of the CFSRR) is devoting major resources to monitoring and evaluating CFSRR results as they are being generated.

The text has been modified.

8. p.23, recommendations, 4th bullet: NCEP should be part of any evaluation of models used for operational prediction. Both GFDL and NCEP need to be involved in this process. NCEP recognizes that more interaction with GFDL on ocean data assimilation and forecasts will be beneficial. While HYCOM is being used at NCEP for operational real time ocean forecasting, there is interest in constructing an ensemble ocean forecast system for daily to annual prediction. Thus, NCEP is considering an ensemble system using both MOM and

HYCOM, given that each model potentially adds forecast value over a spectrum of time scales. This is a lot of work and results won't be available for several years.

The text has been modified.

9. p. 25, 5th para: The ESRL work on Finite Volume Icosahedral dynamics is well coordinated with EMC. There are bi-weekly telecons on global model dynamics improvements and ESRL attends regularly.

The Panel did not see evidence of significant coordination.

10. p. 24, 3rd bullet: suggest "mutually exclusive" instead of "mutually antagonistic."

The text has been modified.

11. pg. 42, 4th bullet. "The CCSP assessment process is almost complete, and will continue to be impacted by political agendas. NOAA should strive to make the remaining process and reports as transparent and rigorous as possible. In the future, more clear and uniform demarcation between the assessment participants and the government (e.g., NOAA) leadership should be realized. More clear articulation of the targeted "users" of the assessment is required. NOAA and other government agencies should not both facilitate and author assessments; there must be a clear independence between these two roles. Conflict-free mechanisms should be worked out so that some NOAA scientists can serve as authors in future assessments."

This is a surprising paragraph. The potential politicization of the CCSP, as far as we can recall, did not arise during the presentations or in the discussions. NOAA researchers have participated and even led the reports, but have never experienced any political agendas or conflicts to our knowledge. There may have been plenty of bureaucratic back and forth, but certainly no political agendas and/or conflict. Some reports involving NOAA scientists (e.g., 1.1, 2.1, 2.4, 3.1, 3.2, and 3.3) have been completed. A majority of them have undergone NRC and Public review processes. These processes have proven adequate to make the reports fair, balanced and free of politics. Several of the reports have been highly praised for their content and presentation.

The paragraph stands as originally drafted.

12. It may be useful to the reader to mention at the outset the fact that CRM is a young Program, crafted out of two earlier Programs in the Climate Goal. Even some of the entities in the present CRM basket (e.g., see CRM Charter) are themselves young. It would be an appropriate recognition if the text explicitly acknowledged the multiple pulls and constraints on the Program in its nascent stage at the time of review.

We have added a sentence to this effect.

13. There is a running theme in the document of insufficient coordination. We would have liked more clarity on how the Panel saw into issues that deal with coordination within Climate Research Program, within NOAA Climate Goal, within NOAA organization, and with the non-NOAA world. It would be useful to hear how the Panel feels we are doing compared to

other agencies, and what our unique roles have been in the past and should be in the future. It would be useful in addition to learn the Panel's views on the ideal roles of CRM, Climate Goal and NOAA "upper-level management".

There is a need for agency guidance regarding support and collaboration across NOAA laboratories, and between NOAA research laboratories and NCEP/CPC. There needs to be a long-term strategic plan for such R2O collaboration and support. We do not know of such a plan.

14. Some clarifications on the transitions to operations in the climate context (say, longer than seasonal timescales) could point out what should be considered to be climate-related operational products. How do we adequately resource transitions? And, how do we adjudge the success of applications? Assessments are regarded as major application products in the climate community. While the document underscores the successes of IPCC and WMO/Ozone assessments, it would be appropriate to acknowledge them as such.

CRM should have its own view of what climate-related operational products are; it is not the Panel's job to identify them. CRM should have its own plan for resourcing transitions, and it's own methods for judging the success of applications. Comment #14 above actually illustrates the planning and coordination issues that the Panel identified in its Report.

15. p. 7. bottom: "There is currently no mechanism to evaluate the readiness of research results for transition to operations." It is not clear what is meant here. There exists the NOAA Transition Board and the Research Council. Perhaps, something more is intended?

Please see the discussion under Panel 3c in the Report.

16. p. 8, bottom: "There is no NOAA-wide integrated approach to the budgetary process..." This is supposed to be the aim of NOAA's PPBES. The Climate Goal represents the NOAA-wide approach to budgeting for the agency's climate activities.

The text has been modified. The Panel did not see evidence that an integrated budget-planning process is working effectively.

17. p. 9. last sentence of 'Panel 5': "At present, NOAA's ESM and decadal prediction efforts do not appear to be linked." This is only partly correct and does not recognize the circumstances. The research at GFDL and NCEP is governed in large part by the human and computational resources available. Like other modeling institutions nationally and worldwide, NOAA centers too need to make choices on how progress in various cutting-edge topics can be made consistent with the resources. GFDL is developing an ESM in parallel with its decadal work, such that the former can be applied to the latter when enhanced computer resources are available.

The Panel believes that the lack of a long-term strategic plan and timeline has resulted in a lack of clarity and expectations among the modeling centers. This prevents them from assigning the appropriate priority to ESM efforts, or requesting computational and financial resources for these efforts relative to other efforts.

18. p. 31, top: “..there is a need for a more integrated NOAA approach to high performance computing.” There is a High Performance Computing Board, chaired by NOAA’s CIO and with GFDL representation. A new NOAA-wide HPC Strategic Plan is due to NOAA Senior Management in August, 2008.

This is encouraging; our Report effectively recommends that you do what you say above that you are doing.

19. p. 32, first bullet of Concerns: “Very few quantitative measures of success were presented.” This is at odds with the recognitions in the third paragraph of the Executive Summary and elsewhere.

The key word is “quantitative.” The Panel appreciates that CRM is doing a lot of good work, but the Review would have been improved through the presentation of more quantitative metrics of success.

20. p. 36, first bullet of Concerns: “...too many examples of lost opportunities”. While some undoubtedly exist, there are also examples of successes over the years (e.g., MOM, Hurricane model physics). “Too many”, in the absence of specifics, appears to be an overstatement.

The text has been modified.

21. Because of the CWG/CPO/CRM need to keep the review meeting duration short and the resulting tight scheduling, there were many interesting topics that could not make it into the agenda. Thus, many research and model development activities pertaining to atmospheric dynamics, physics and chemistry, and important outcomes resulting from intra-OAR collaborations could not be presented. A partial list of recent publications was sent to the Panel Chair after the review, however we recognize that this cannot replace the value of having a structured agenda explicitly featuring the topics.

The Panel recognizes that the scope of CRM could not be covered comprehensively in the time allotted for the Review. The Panel based its Report primarily on what was presented at the Review. Naturally, each of the Panel members is aware of CRM research that was not covered at the Review.