

Introduction

The Scientific Advisory Board (SAB) is unanimous in their support of the concept of the Climate Test Bed (CTB). The SAB believes this is a major step toward getting improved community involvement to accelerate the improvement and quality of NCEP's Climate Forecast System and the inherent transition from research to operations. The CTB represents a relatively new approach and way of operating within NCEP. This makes it all the more important that the CTB "hits the ground running".

This summary of the initial conference call of the SAB has several common themes. Many of our comments reflect the new and novel nature of the CTB. A number of the issues outlined below are to be expected to arise at this nascent stage of development. We are also aware that, in advance of this summary, some actions have already been taken in response to our initial teleconference. The topics we discussed, seek further clarification on, and recommend attention to include:

- Science Plan and Priorities
- Computing and Data
- Conflict of Interest
- Community Involvement and Linkages

Science Plan and Priorities

A comprehensive science plan, inclusive of the transition from research to operations, needs to be articulated, with achievable goals, well-defined priorities, plans for allocation of resources, and milestones. This science plan should guide the OGP solicitations, so that, for example, the distinction between "CTB" activities and normal model development activities is clear. The science plan should also guide the "redirection" of human resources to the CTB. More thought could usefully be given to the process by which priority activities for the CTB are identified. For example, there needs to be discussion about the extent to which the CTB should focus on model improvement rather than multi-model ensemble efforts. As another example, there needs to be discussion about how to substantively involve models from outside NCEP. It is our understanding that one of the main thrusts of CTB is to take full advantage of models from other centers so as to further enhance the Nation's overall performance in S-I prediction. The science plan should articulate the philosophy toward S-I priorities, model development, testing and exchanging physics and dynamical packages from various models, and producing forecasts using multi-model ensemble approaches. In this regard, further clarification is needed on activities/responsibilities that belong to the "home institution" vs. activities that are the responsibility of the CTB. Good choices here will have a very positive outcome.

There also needs to be an intimate link between the priorities and resources. A major concern is whether or not there are adequate resources for the CTB to have a real impact. Hence the importance to scale the work plan to resources. With a comprehensive science plan and strong leadership, it is more likely that demonstrable improvements in forecasts and services will be made.

Periodic review of the science plan and engagement with the external community are essential. There should be an annual workshop to engage the research community in

a review of the progress of the previous year toward the goals of the science plan and to openly discuss the foci for the next year.

Computing and Data Access

Computing and data storage are critical resources of the CTB that demand a sound approach. A policy needs to be developed on how computing resources are allocated for externally funded NCEP projects that are not part of the CTB, but part of “climate”. Similarly, the role of the CST in evaluating/recommending the allocation of computing resources needs to be better defined, along with the criteria and relative weights for evaluating the scientific value and the appropriateness of the computing strategy. It is recommended that the CTB consult with the Scientific Computing Division at NCAR to benefit from their experience on this matter.

With respect to data access, the CTB needs to define its near and mid-term storage plans for online access to the initial CFS hindcast data set and beyond. This needs immediate attention. As part of this plan, it is imperative that the full hindcast data set, including at least daily resolution for selected fields and monthly means for the entire set of variables and levels, be made available as soon as possible. The CTB should avail itself of all possible avenues of providing online access. There needs to be an open process for determining when and how best to share data from CTB activities, including the nature of the data sets to be shared (output frequency, variables included, etc.), the requirement and allocation of resources for quality control (QC) of research data sets, and how data sets generated outside NCEP are to be handled. For example, when a CTB collaborator creates a hindcast data set with a new model or model version for assessment as a candidate for multi-model operations, how is that data set to be QC’ed and shared with the CTB community? All these details will derive directly from a science plan that explicitly establishes the process whereby the community collaborates with NCEP. In the interest of treating weather and climate as seamless, high frequency data are crucial. In the interest of developing an understanding of how the model performs, full model resolution is likewise crucial.

The process for identifying such data sets should be an open one. In particular, the CTB Scientific Advisory Board should be tasked with developing a process to determine the baseline data set and plans for future development.

Conflict of Interest

Conflict of interest at two different levels of the CTB is a serious concern of the SAB. One is the perceived conflict of interest of the SAB itself or, for that matter, the Oversight Board. In order for the SAB to contribute to the success of the CTB, the SAB should have a vested interest in the success of the CTB, including the opportunity to submit proposals and be selected as CTB investigators in free and open competition. To do otherwise would seriously dilute the skill and expertise needed by the SAB. It is our understanding that the SAB advises the Oversight Board, Directors of the NOAA Climate Office and NCEP on issues pertaining to CTB activities. These would appear to be more in the nature of broad policy or other guidance as opposed to any specific proposal reviews, or working level or resources decisions; areas where conflicts might more naturally arise. As with any other panel activity, where there are real or perceived conflicts on any specific issues, it would seem that any SAB member would simply

recuse him or herself from discussions on that specific issue. Many of these same arguments hold for the Oversight Board.

Another conflict of interest issue pertains to the composition of the CTB Science Team (CST). Consistent with practices in NASA and other agencies, the science team should consist of civil servants selected from the host agency plus the non-civil servants (i.e. external participants) who were selected as a result of the peer-reviewed competitive proposal process. To have constituted the CST in advance of the competition seems to have been premature. Moreover, there is considerable benefit in having the chair of the science team be external to NCEP, which we highly recommend.

Community Involvement and Linkages

It is essential that the research community be involved at all levels of the CTB. The independent advisement role of the SAB and membership from outside NCEP on the CST provide good pathways for involvement. In addition, the research community should be involved in other ways through bi-directional flow of information and opportunities to influence the decision-making process. Along the way, there also needs to be a realistic assessment of how much internal human resources are needed to engage and support the external community.

In order for the CTB to be fully successful, meaningful partnerships need to be considered with the various NOAA line organizations. The CTB needs to consider what efforts it can take to initiate such partnerships. For example, the manner in which observational requirements derived by the CTB, needed to advance prediction skill and model parameterizations, will be coordinated with other parts of NOAA, is one area in which obvious opportunities for partnerships exist.

A particular concern is the role of surface hydrology in the CTB and its transition from research to operations. The CTB needs to be cognizant of and reach out to connect with the activities in the NWS/OHD, including the National Hydrologic Prediction System, which, as it evolves, will clearly have requirements of and possibilities for the CTB. Given that the water sector is one of the main areas that would benefit from better climate forecasts, some clarification is needed as to how the CTB will interact with the OHD.

Going further down this application path, it is self-evident that the output has to be of practical value. There are early signs that the new approach represented by the CTB is being well received. It is essential that the stakeholder community be engaged and permitted to develop a sense of ownership of CTB. Additionally, the international research community potentially has a lot to offer by way of partnerships and information sharing. Thus it is recommended to broaden the SAB membership to include private sector and additional international participation.

Summary

In summary, the CTB approach holds considerable potential for advancing seasonal to interannual forecast skill. In order to achieve that potential, a clear strategy is needed for the following: strengthening the science plan, identifying priorities, developing an annual work plan, developing a computer and data access plan, assessing annual progress, and engaging various communities of researchers and stakeholders. Here we have raised many issues pertaining to process, implementation, and management. We

raise them because of their impact on the science of the CTB. After this initial phase of engagement, the SAB wishes to focus most of its attention on providing advice to strategic implementation, but not on day-to-day management of details. In the future we wish to be in a position to provide overarching guidance to the approaches needed within the CTB to ensure that outputs of the program, both current and future, gain and retain international leading edge status.