Process for Establishing Chesapeake Bay Modeling Laboratory

Once sustained funding is secured for the Modeling Laboratory, there are several mechanisms that could be explored for establishing the research and development laboratory to assist in advancing research and development of management-identified modeling priorities. First, by-laws for governance, decisions, identification of management priorities, and a schedule for delivering model code from the modeling laboratory would be adopted. Procedures for activities and oversight by the governance board would be drafted, reviewed by the CBP partners, and codified to specifically define the decision processes for operations and activities of the Board and the laboratory. This would include allocations of specific amounts for research and operations not to be less than $2.0M annually.

Second, the MLAT recommends that the governance Board work with the funding organization to develop a Request for Proposals/Request for Services (RFP/RFS) that outlines tasks that would be completed in the modeling laboratory. MLAT envisions a request that would seek proposal submissions addressing two or three specific functions in a modeling laboratory. The successful request from an applicant/organization for a CBP Modeling Laboratory would include:

1) Permanent/core staff: A director, a half-time administrative assistant, and permanent, full-time staff modelers. All decisions in the laboratory would be the director's responsibilities and he/she would be the primary contact with the ML Board and Water Quality GIT. The administrative assistant would provide secretarial help and some writing assistance to the director. The full-time staff would 1) provide CBP data and model code and output to model experts and 2) transition newly developed model or model code, documentation, and calibration/verification data back to the CBP. These individuals would communicate with CBP operational modeling staff and the ML Board on all aspects of model calibration, with documented, scheduled calls, meetings, and electronic correspondence to insure two-way communication between the modeling laboratory and the CBP model operations team. However, final decisions on 'next steps' in any of the staff's activities would be in the director's purview.
2) Modeling expertise for management-specific modeling needs: Each year, the ML Board with input from the Water Quality GIT and other Bay Program GITs (see Governance Section above) would determine management-specific modeling priorities for exploration in the modeling laboratory. To address these priorities, the lead organization of the laboratory must have documented access to broad modeling expertise, allowing inclusion of modelers in many disciplines (such as, local to regional hydrology, physical processes impacted by land cover and use, biogeochemistry of soils and water, biology, and fisheries). Those proposing to serve as the CBP Modeling Laboratory must therefore identify expertise across many modeling areas, through letters of agreement from model experts in the submitted proposal accompanied by extended *curricula vita* outlining models or model code previously developed (and implemented) by each model expert.

Selection of the organization to host the Modeling Laboratory would require rigorous, non-conflicted peer review. Unbiased review would be assured through inclusion of technically skilled modelers (federal and academic), science experts, and two types of representatives of the management community, those

familiar with regional commitments to 1) load reductions and land uses and 2) use of models in jurisdiction decision-making. The format of the modeling lab would ultimately be determined through the selection process, but would probably be a combination of physical lab and virtual lab; with a core staff in one location, and other needed expertise available in other locations.

A long-term (5 year) cooperative agreement, with annual review of progress, would be the most appropriate mechanism for the award, because this funding option enables active communication and cooperation between the ML Board, GITs, and the modeling laboratory organization in delivering collaboratively-defined and executed models or model code. Multiple iterations and alterations in models, modeling laboratory activities, and responses with the CBP partners can be discussed and implemented, with flexibility across years for use of research funds for continued model refinement. A long term award would also enable repeated adjustments for calibrations in response to partner needs and requests should the modeling laboratory be assigned model calibration as part of its mission. Another mechanism could be a contract, but that would be a binding, inflexible option with specific deliverables and dates, all communication mechanisms defined and scheduled, and required data and model code archives and access stipulated. Although attractive for fixed delivery of code or model, iterative adjustments in code or a model or extended refinements in model calibrations could easily exceed allocated funds, potentially jeopardizing delivery of useful, implementable code or model to the partnership unless a specific number of modeling laboratory iterations or calibrations were defined (this is a serious concern and funding for calibration and delivery of the 'gold standard' CBP model (Recommendation #2 above) must be distinct from the sustained funding for models of new topic areas). A grant is a third funding option, but a grant is not recommended for the Chesapeake Bay Modeling Laboratory. A grant leaves all decisions to the grantee, with the initial negotiated award the only restrictions on the modeling laboratory activities. If the initial negotiated award does not cover all possible contingencies for modeling and deliverables, the partnership has limited recourse in receipt of model code or models that it the CBP modeling team or the ML Board believes are inadequate or nor responsive to the management need.

Based on input from Bay Program GITs and each year's modeling laboratory output, and if needed, technical insights from an external peer review (e.g., STAC), the governance board would recommend continued support for the modeling laboratory organization as well as identification of additional management-specific modeling needs for new model or model code development. The modeling laboratory director would seek expertise from the larger modeling laboratory to meet the management need, using relevant peer review that his/her organization implements to insure competency in model development by the new model experts. These comments would be kept on record for ML Board review on criteria used in the selection of the experts. These processes would be repeated each year through the duration of the award, if functional code and calibrated models (if selected as a laboratory responsibility) have been delivered to the CBP operational modeling team. If delivered code or calibrations are deemed inadequate, supported by additional technical review, the agreement can be voided and a new RFP/RFS issued for more responsive, functioning laboratory deliverables.