Modeling Lab Action Team Meeting Minutes

June 21, 2012 10am – 3pm
Chesapeake Bay Program Office, Joe Macknis Memorial
Conference Room (Fish Shack)
Annapolis, MD

http://www.chesapeakebay.net/calendar/event/18457/

Participants:

Mark Bennett – USGS	Lewis Linker – EPA/CBPO	Gary Shenk – EPA/CBPO	Kevin Sellner – CRC
Raleigh Hood – UMCES	Donald Weller – SERC	Lee Currey – MDE	Theodor Tesler – PA
William Keeling – VA	Kevin McIlhany – USNA	Donald Boesch – UMCES	Howard Townsend – NCBO
Heather Cisar – USACE Baltimore District	Larry Band – NC	Dominic DiToro – UDEL	Marjy Friedrichs – VIMS/STAC
Matthew Johnston – CRC/STAC	Amanda Pruzinsky – CRC		

Action Items:

- The conference call will be held on July 3rd 12:30PM – 2:00PM. The conference call will be focusing on identifying shortfalls/problems in the current modeling setup at the Bay Program and discussing the agenda for the August face-to-face meeting. The face-to-face meeting will be August 28th 10:00AM – 3:00PM (location TBA). MLAT members are encouraged to give input as to agenda items for both the conference call and August meeting.

- MLAT members should send any comments/recommendations for the Modeling Lab to Amanda Pruzinsky (apruzinsky@chesapeakebay.net).

- The MLAT will report back to the Management Board on its findings, options, and recommendations within nine months.

- The Management Board will then decide on what specific recommendations to put forward for deliberation and final decisions by the Principal's Staff Committee.

Minutes:

Welcome and introductions – Mark Bennett (USGS)

Why we're here – Mark Bennett (USGS)

Mark Bennett discussed the benefits of establishing a Chesapeake Bay modeling laboratory, Management Board recommendations on the modeling lab, the responsibilities and functions of the Action Team, and the membership of the Action Team. The Modeling Lab Action Team will report back to the Management Board on its findings, options, and recommendations within nine months. In turn, the Management Board would then decide on what specific recommendations to put forward for deliberation and final decisions by the Principal's Staff Committee.

For more information the presentation is available at
http://www.chesapeakebay.net/channel_files/18457/mark_bennett,_usgs_-_presentation.pdf

Genesis – Dominic Di Toro (University of Delaware)

Dominic Di Toro discussed the National Research Council report "Achieving Nutrient and Sediment Reduction Goals in the Chesapeake Bay: An Evaluation of Program Strategies and Implementation" including tracking and accounting, milestones, committee membership, and the recommendation of establishing a Chesapeake Bay Modeling Laboratory in order to meet goals. He also discussed possible tasks and organization of the Modeling Lab and offered examples of labs and institutes that the Action Team could research and discuss (Great Lakes Environmental Research Laboratory, National Center for Atmospheric Research, Geophysical Fluid Dynamics Lab).

For more information the presentation is available at
http://www.chesapeakebay.net/channel_files/18457/dominic_di_toro,_university_of_delaware_-_presentation.pdf

What we currently have — Gary Shenk & Lewis Linker (EPA/CBPO)

Gary Shenk and Lewis Linker discussed the current situation at the Chesapeake Bay Program. This included the size and organization of the Chesapeake Bay Program and the workgroups, teams, and partnerships involved, focus of recent stakeholder input, and the current cost and focus of the modeling team. Lewis also briefly discussed intangible funding.

For more information the presentation is available at
http://www.chesapeakebay.net/channel_files/18457/gary_shenk__lewis_linker,_epa_-_presentation.pdf

Proposal of a Bricks and Mortar Modeling Lab - Kevin McIlhany

Kevin McIlhany discussed questions that the Action Team must address when designing and organizing a Modeling Lab including location, monitoring, personnel, balancing science and regulation, funding, and development. He urged that even with a physical lab there must be collaboration. He highlighted concerns of the May 2011 NAS/NRC Report including the limited number of models and individuals at CBP.

"While a building is nice, the collaboration that takes place within it is the singular most important thing. I believe that getting scientists and people who have had program management experience in the same hallway is what is truly needed to cross-over many ideas/goals. Of course we could do this by intensifying modern collaborative techniques, but seeing your colleagues face to face on a daily basis will knit together those cultures better than any other method. In the end, the question becomes, if we decide to build a bricks and mortar lab, other than office spaces, what can/should we put inside of the building. I think that to complete the collaborative picture, the third arm needs to also be included, the hardware aspect. In this manner, modelers, former program managers and sensor/data taking people will be talking within a common framework on a regular basis. I could also recommend a CAVE which would be a tremendous scientific visualization tool, but also a unique public relations tool. Imagine holding a tour once a month (or week) for the public to come in and "see" what we are working on. As Don and others mentioned, this is a simply a wish, provided the funding became available. If a decision is made to move forward with a building, then there are many specific questions that immediately come up. The main question however is whether to foster collaboration virtually or face-to-face."

For more information the presentation is available at
http://www.chesapeakebay.net/channel_files/18457/kevin_mcilhany,_usna_-_presentation.pdf

Proposal of a Virtual Modeling Lab – Donald Boesch (UMCES)

Donald Boesch first discussed the GAO and Executive Council recommendations and analysis, the charge developed by the IE Action Team, the NRC Committee, and the NRC Report which involved tracking and reporting, two-year milestones, adaptive management, and strategies for meeting goals. He then discussed the how a Bay Modeling Laboratory would benefit the Chesapeake Bay water quality goals. He provided examples of other labs for discussion (GFDL, NCAR, Nuclear physics laboratories, GLERL, EPA labs, Everglades Interagency Modeling Center, Baltic NEST Institute). He also discussed advantages of a virtual approach, how to get to a collaborative modeling approach for the CBP, and some immediate challenges.

For more information the presentation is available at
http://www.chesapeakebay.net/channel_files/18457/donald_boesch,_university_of_maryland_-_presentation.pdf

General Questions and Discussion:

➤ Division of responsibility
  - Currently, there is one central model and a relatively small group of people working on it. The modeling lab could help in the division of responsibility and bring in other interested parties.
  - In the current model, time for research development and model application are often segregated. A larger team would enable both to operate at once.

➤ Virtual, Bricks and Mortar, or a combination?
  - Building on what we have (the Modeling Team at CBP) vs. starting from scratch?
  - Need to come up with a design that would work with our amount of funding. It may be more reasonable to build on the Modeling Team at CBP.
  - A structure that works and is permanent (relevant in the future).
  - Needs to facilitate collaboration
  - Transparent and accountable

➤ Purpose of the Modeling Lab?
  - Running a model in parallel – Decreasing uncertainty
  - Multiple model approach
  - Have a team to work on problem areas in the model, while still producing deliverables
  - Research, development, and implementation – all at once!
  - Transparency, accountability, and collaboration
  - A Modeling Lab could help find a balance between science and deliverables
  - The Modeling Lab should set realistic expectations of the model that are consistent with the regulatory component of EPA
  - Gary Shenk said that he has little input in the model "inputs" development and the States said they have little input in model decisions. Need to evaluate the decision making structure
  - Marjy Friedrichs - It is extremely important to first document the challenges/issues that the Modeling Group currently faces, and then secondly discuss what type of Modeling Laboratory could best address these challenges.
  - Raleigh Hood **-** Possibly using the existing modeling activities and adding on a formal modeling R&D capacity, not requiring bricks and mortar. This would not be optional but an integral, continuously supported component of the CBP Modeling Suite, dedicated to model development, revision, exploration for management needs

➤ Framework vs. Modeling questions
  - Many issues were brought up that may be framework and management issues and not modeling issues. These questions could not be solved by a Modeling Lab, but many of them have modeling solutions if passed through management. The Modeling Lab may also be able to help facilitate research in problem areas, in order to create a better case for concerns that are being brought to management.

➢ May be beneficial to look at other Modeling Laboratories and Best Practice Modeling reports by EPA and others

➢ Possibility of traveling to other Modeling Labs
- Kevin Sellner and Gary Shenk - May be more beneficial to speak to contacts that work in the lab or organizations that receive the products in order to get an honest opinion.

Don Weller, SERC

- The EPA already has a modeling group that has been providing the products needed for TMDL development and implementation, and they have been largely meeting the demanding deadlines. We definitely don't want do to anything to damage this existing capability. EPA should probably keep these functions under its direct control because they are needed for EPA to meet its legal responsibilities.

- Meeting the management deadlines consumes most of the energy and resources of the current modeling group, so relatively little effort goes into other areas; such as investigating model performance at intensive study sites, exploring uncertainty analysis, investigating multiple models, performing model comparisons, and other activities that could more rapidly advance knowledge of the Chesapeake Bay system and how to better model it. Improvements in knowledge are critical to successful adaptive management, so these activities merit more attention.

- We should think of a new modeling lab as a way to promote the activities that currently fall through the cracks. The lab should be independent of the EPA and the states so that it is not hindered by EPAs legal responsibilities or state politics. However, the independent lab should be designed to foster communication and interaction with the EPA modeling group.

- Creating a modeling lab will require obtaining new resources, not reprogramming existing resources, because the current resources support the existing modeling capability. A new lab would require real money to hire new people or to pay existing modelers at independent labs and universities through grants or contracts. Funds should be allocated to labs and universities through a rigorous peer review process.

- The CCMP has tried to fill some of these functions, but its success has been limited by lack of resources.

- The lab structure that would meet these needs and its source of support are TBD.

Ted Tesler, PA

- Recognition that models are estimated representations of reality
- It will be difficult to justify a major laboratory expense that does not put BMPs on the ground
- The laboratory should be scientifically objective and it's models should not be used for enforcement purposes (science not management)
- A one-size-fits-all model is difficult to maintain with increasing segmentation/complexity
- Separate regional or sub-basin models should be considered within the lab.

William Keeling, VA

- Concern was expressed as to the idea that we know everything that is needed to be done related to Bay restoration. If that is the case why is a modeling lab needed? Especially since the TMDL and implementation plans have been developed. Funds spent building and operating such a lab instead could be spent on implementing those things we know we need to implement? It should be this action team that clearly lays out the case why such a lab is needed and what else related to Bay restoration is still unknown and needing further investigation by such a facility or facilities or why additional or different modeling tools are needed.
- More academic involvement and transparency to all the modeling is needed and desired by Virginia. If that means a combination of brick and mortar buildings and virtual connections via computer nodes with all interested universities then that would be considered an improvement over the current modeling lab situation. The state is not interested in a situation that basically leaves us with the current USEPA led and funded effort that has resulted in what is considered a Maryland centric and politicized effort.
- Virginia would rather see a lab built and run in a state outside the watershed than to end up with what currently exists or something similar. The state is willing to contribute financially to an independent lab that would be the technical clearing house and have final say on science based-decisions covering all aspects of the modeling. The Commonwealth is seeking that all options be evaluated related to location or locations and associated costs estimated for establishment and annual operation for the options investigated. Virginia is interested in this becoming a place where modeling tools be developed and completely tested with Virginia's involvement before the state is required to use such tools.

Lee Currey, MDE

- All options for a modeling laboratory should be evaluated to better understand both the advantages and disadvantages. This includes the option of the current framework, a bricks and mortar building and a virtual framework, or combinations. The assessment criteria must consider improving model reliability,

model transparency, understanding, and communication to both the scientific community and general public.

- Discussion of the internal organization of a modeling laboratory should be a priority of this workgroup.
- Historically the Chesapeake Bay Program has been open to the discussion of model revisions, refinements, problems, etc. Following the establishment of the TMDL there has been less clarity on how further model improvements will be identified and prioritized. This perceived change should be discussed.
- A modeling laboratory must operate under an adaptive management framework that considers the research and development side while in parallel the application of the current model version used for decision making. It appears that the current framework, due to resources, is in series where it needs to happen in parallel. This adaptive framework should consider:
    - Transitioning to newer models. For example, when moving to a newer model version that has originated through the learning (adaptive) stage, a transition and explanation of changes must be clearing communicated to scientific and public communities. This still resides as an issue of moving from Phase 4 to Phase 5 and evaluations of 2-year milestones.
    - A decision framework for model revisions. This framework must identify how revisions to the regulatory (accountability) model will occur. Decision making for model revisions must be rooted in science and scientific integrity must be at the forefront.
    - A structure that allows for integration and discovery through application of multiple models.
- A modeling laboratory must have the resources to explore the models to improve the understanding of a complex system. The results of these must be provided in a clear format that is accessible in one location.
- A modeling laboratory should explore more than just the science models but should be capable of exploring other management aspects, such as cost.