



Modeling Workgroup- Quarterly Meeting Minutes
April 16, 2012 10am-2:30pm
Chesapeake Bay Program Office, Joe Macknis Memorial
Conference Room (Fish Shack)
Annapolis, MD

<http://www.chesapeakebay.net/calendar/event/18187/>

Participants:

Lewis Linker- EPA/CBPO	Gary Shenk- EPA/CBPO	Peter Claggett- USGS	Ward Sanford- USGS
Gopal Bhatt-PSU	Lindsay Deel-WVU	Norm Goulet- NVRC	Ping Wang- VIMS
Richard Tian-UMCES	Lee Currey- MDE	Mark Bennett- USGS	Ted Tessler- PADEP
Mark Sievers- Tetra Tech	Ross Mandel- ICPRB	Karl Berger-MWCOG	Chris Duffy- PSU
Megan Hession- CRC			

Developing Land Use Data for the Mid Point Assessment – Peter Claggett (USGS)

Peter discussed plans to refine land use data for the 2017 Mid-point Assessment. The current land use data significantly underestimates the amount of development and impervious surface in the watershed. The 2010-11 update of Landsat land cover data for the Chesapeake Bay watershed will integrate 2010 cropland data layer, the Farm Service Agency Common Land Unit polygons (shows farms that receive subsidies), and impervious surface weights.

This more detailed land use data will be helpful in crediting BMPs and may be able to help determine the role planning can play in reducing nutrient and sediment loads.

- The group agreed that as more detailed information is incorporated into the Watershed Model, CBP must manage stakeholder expectations and continue to communicate the objective of the model: to be a large scale planning and tracking tool.

A Cloud Approach for Watershed Model Data – Chris Duffy (PSU)

Chris Duffy discussed a possible cloud approach for managing watershed model input data. He provided examples of accessible, integrated, and scalable workflow solutions that support automated and efficient data management, assure reliability, and automatically capture provenance. Examples included the **Center Modeling Paradigm** in which a core group of people design the workflow to run specific models, the results of which are published to a community of users; the **Long Tail Paradigm** in which individual investigators run their own workflows and integrate their data with data from shared sources; the **Big Data Paradigm** in which large datasets with computationally intensive codes are routinely run, requiring high-end computing resources and scalable infrastructure; the **Metadata Rich Paradigm** in which a collaboration tracks metadata of all data used and produced by their analyses; and the **Whiteboard Paradigm** in which a group of investigators, decision makers in a collaboration on an

interdisciplinary investigation drafts a sketch of what looks like a workflow in order to gain an understanding of what models they are agreeing to run on their data.

Q: Can you have both course scale and fine scale with the cloud approach?

A: The cloud approach allows multiple users, multiple platforms, and multiple scales.

Chris Duffy suggested that the CBPO follow a similar approach as Penn State with a spatial server with web service to present web based land use/land cover data to the public.

Chris is looking for places in the Chesapeake Bay watershed where reasonably long term data are available to test models, and is seeking input to inform workflow.

http://www.chesapeakebay.net/channel_files/18187/a_cloud_approach_for_watershed_model_data.pdf

A Refined and Expanded CBP Precipitation Time series – Gopal Bhatt (PSU)

Gopal presented a refined and expanded CBP precipitation time series which incorporates NLDAS 2 data. He compared the quality of predictions using XYZ and NLDAS data. NLDAS allows for more recent observations to be incorporated.

- The next step will be to calibrate the CBP model with NLDAS; bring back at the July quarterly meeting for a decision of application by the CB Modeling Team.

Gopal also provided an update on the development of a large scale application of a physics-based distributed hydrologic model.

http://www.chesapeakebay.net/channel_files/18187/a_refined_and_expanded_cbp_precip_timeseries.ppt.pdf

A Delmarva Groundwater Model – Ward Sanford (USGS)

Ward Sanford presented a new groundwater model of Delmarva which provides, among other things, insights into the ages of groundwater. The results of a groundwater flow model were coupled to a nitrate-mass-balance regression model and calibrated against stream nitrate data. The calibrated model suggests that nitrogen uptake efficiencies on the Eastern Shore may be improving over time. However EPA targets for reduced loading of 3 million pounds on the Eastern Shore per year will likely not be reached for several decades even with significant cutbacks in fertilizer use. This model has utility as a tool for targeting areas in which reduced nitrogen loadings would be most beneficial.

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Developing Satellite Imagery-Based Forest Disturbance Metrics – Lindsay Deel (WVU)

Lindsay Deel provided an update on her work to develop satellite-imagery based forest disturbance metrics to improve predictions of nutrient and sediment loads to the Bay. She is using long term

datasets to investigate forest disturbance types (e.g. fire, harvest, and invasive species infestations/insect defoliation – effects on canopy cover) and how this information can be used to create discrete forest disturbance categories and how this can be incorporated into the watershed model. With disturbance comes a large nutrient pulse. MODIS (1990-current period) is being used for forest disturbance estimates.