



Bay Oxygen Research Group Meeting

Thursday, June 17, 2021
2:00 PM – 3:00 PM

Meeting Link*:

<https://umces.webex.com/umces/j.php?MTID=m31984edd591fcc4b9f545bc507197d25>

Meeting Number: 120 286 2305

Password: BORG

Conference Line: +1-408-418-9388 Access Code: 120 286 2305

Meeting Materials:

https://www.chesapeakebay.net/what/event/bay_oxygen_research_group_june_2021_meeting

*If you are joining by webinar, please open the webinar first, then dial in.

This meeting will be recorded for internal use to assure the accuracy of meeting notes.

Action Items:

- ✓ At the next meeting continue discussion on alternative interpolator methods for the 4D estimator and have Isabella present.
- ✓ Send Rebecca Murphy (rmurphy@chesapeakebay.net) or Peter Tango (ptango@chesapeakebay.net) any thoughts on development of the tool.

AGENDA

2:00 Welcome, Introductions & Announcements – Peter Tango, Coordinator (USGS@CBPO)
A Chesapeake Bay Program webpage has been created for the Bay Oxygen Research Group (BORG). The link is available here.

2:05 [Stakeholder Requirements](#) – Rebecca Murphy (UMCES)
Continue discussion from May BORG meeting on stakeholder requirements for tool development. Documenting requirements and referencing the elements of the existing interpolator that we want to retain in our new interpolator will be discussed.

Discussion:

Richard Tian commented on the suggestion for incorporating more available data streams and data types. Does this mean dataflow or ConMon data? Rebecca said they want to continue using citizen monitoring data. They are looking into the vertical profiler data that was deployed last year with the hope of having more in the future. Satellite data may also be useful. They are probably going to be using wind, flow, and tide data to build some deterministic models to aid in improving accuracy on the short-term water quality interpolation.

In terms of criteria assessment, Richard Tian said they also systematically interpolate CHLA. CHLA needs to be added to the bullet, "Initial focuses on oxygen." Rebecca asked if there was short-term criteria for CHLA. Richard Tian said there is seasonal criteria. Peter Tango said Tish Robertson is the most up to date on criteria CHLA due to the James River criteria reevaluation. Tish said they retain the seasonal mean. They do have short duration criteria that they evaluate using a frequency over time instead of an average over a season. Then they evaluate how frequently the exceedances occur. They are doing this outside of the interpolator. The assessment method they came up with doesn't rely on spatial interpolation.

Peter Tango said an item to consider is the grid resolution of the new interpolator. The old interpolator works on a 1 km² x 1m deep cell resolution. The CBP model is going to an unstructured grid, and since they are trying to coordinate efforts, do they need to consider the grid resolution and grid design in this interpolator. Richard Tian said at this point in the development make sure everything is working smoothly with the old resolution and then reconsider it.

Gary Shenk said the things they are considering are continuous in space and time, so the resolution is a piece of output software. Resolution is not a decision they need to make right now if different outputs call for different resolutions.

Elgin Perry said theoretically that space dimension can be determined at the time of producing output, but he thinks there are limits to computing power when making it finer and finer, therefore, starting more coarse to get the process working is deemed first priority and revising resolution to finer scales can occur as a next phase.

Tish Robertson said one of the new needs is improved vertical interpolation. The interpolator does a linear regression through the water column, and she thinks they could do something different with it.

Elgin Perry commented on second bullet of statistical estimates of uncertainty. Another different idea is that they also want a tool that reproduces the full variability of observed data. The interpolator always strives to find a smooth surface close to the mean of the observed data. For some of the assessments, they need to reproduce the full range of data (versus a focus on the mean for example).

Elgin Perry said the current interpolator has a lot of rules on how far it reaches in space to incorporate stations used in computing the average. The property of dealing with the anisotropy in the bay is needed in the new interpolator. Tish Robertson asked if they need to have new data regions. Elgin said part of the reason to have data regions is so that it doesn't reach across land to get points. Tish said with data regions are boxes, and for interpolation, the issue is more about how far from another segment does it borrow data to include in a data region interpolation (i.e., reaching beyond the boundaries of the box you are working in to drive areal interpolation). Peter Tango said part of a lot of work has been driven by constraining the data to one primary data source, the long-

term CBP fixed station monitoring data (and some dataflow calibration site data). If they are opening opportunities to including more citizen science monitoring data in the data sources, it could lead to more flexibility to not be as constrained. Peter said he agrees they will need to reconsider the data regions. Tish is saying she sees why the data regions are needed, but it would be nice to consider their need and boundaries in the mainstem.

Mark Trice said the tools of ArcGIS are more advanced to allow for a lot of the suggestions. We could use more details from Mark on capacities here.

Elgin Perry said when they are doing predictions in the temporal domain, he hopes the tool will use covariates.

2:25 [Data Needs for Infrastructure Development](#) – Peter Tango

We will review existing monitoring efforts and new vertical profiler deployments for consideration on how to support data needs of the water quality estimator.

Data support for the interpolator include:

- Long-term monitoring data
- Shallow water monitoring data
- Dataflow
- Vertical profilers
 - o Two new deployments are CB4.3E and CB4.3W
- Citizen science monitoring

2:45 Tentative: Alternative interpolator methods for the 4D estimator – Isabella Bertani (UMCES)

Consideration for an alternative method to explore in addition to GAMs + simulation may be touched on as a lead into our next agenda item regarding summer activities.

- This presentation has been moved to the next BORG meeting.

2:50 Schedule Summer Activities – All

Based on our team discussions to date, the summer season will be used to build out the recipe for the structure of our interpolator. Development of a requirements document will be underway over the next 3 months. Exploratory tests of methods will be conducted to inform a decision in autumn on the development path forward. Meeting frequency may change as development work is underway.

Rebecca Murphy said if the team has any thoughts about the development of the tool after the meeting to please contact her or Peter Tango. Peter Tango also said that information will be shared through the Monitoring Newsletter. **There is no July BORG meeting.**

3:00 Adjourn

Participants: Breck Sullivan, Peter Tango, Rebecca Murphy, Andrew Keppel, Angie Wei, Carl Friedrichs, Diana Domotor, Elgin Perry, Gary Shenk, Guido Yactayo, Isabella Bertani, Lee McDonnell, Lucretia Brown, Marjy Friedrichs, Mark Nardi, Richard Tian, Tish Robertson