



Tidal Monitoring and Analysis Workgroup Meeting Minutes

June 12, 2012, 10:00am-3:00pm
Potomac River Fisheries Commission
Colonial Beach, VA

Attendees:

Walter Boynton-UMCES	Liza Hernandez-UMCES	Peter Tango-USGS	Ashlee Harvey-CRC
Ken Moore-VIMS	Jackie Johnson-ICPRB	Richard Tian-UMCES	Renee Karrh-MDDNR
Jonathan Kellogg-UMCES	Cindy Johnson-VADEQ	Elgin Perry-Stats Consultant	Don Smith-VADEQ
Bill Romano-MDDNR	Mark Trice-MDDNR	Brian Smith-MDDNR	Roberto Llanso-Versar
Bruce Michael-MDDNR	David Simpson*- Natl. Center for Environmental Economics	George Waldbusser- Oregon State University	Richard Lacouture- Morgan State University

*Mr. Simpson is working with Kevin Sellner on TMDL cost benefit analysis.

Resulting Action Items:

- Summarize the discussion and identified issues related to water clarity assessment; send summary out to TMAW members to rank issues by priority and provide feedback on how to go about developing a plan to address the issues with water clarity assessment. (W. Boynton, L. Hernandez, P. Tango, & A. Harvey)
- Send papers about studies in Washington that are examining shellfish and bivalves related to carbonate chemistry to TMAW members that are interested (G. Waldbusser).
- Contact MDE and the fisheries organizations involved in oyster restoration projects about whether or not they'd like to work more on the carbonate chemistry issues that G. Waldbusser described and update TMAW on any developments (M. Trice).
- Send a summary of the Choptank synthesis workplan and related items to TMAW members for review before the next meeting. (W. Boynton)

Announcements:

- A joint meeting with the Non-tidal Water Quality Workgroup is being planned; details will follow once a date has been finalized.
- Reminder: Tidal Water Quality Data Provider conference call is June 14, 2012.
- The Umbrella Criteria report has been finalized by STAC and will be released June 18, 2012.
- In the upcoming weeks, MDDNR will be deploying a vertical profiler at Harris Creek off of the Choptank (depth is ~10-15ft).
- The Eyes on the Bay website has a new water quality alert system feature through Twitter; email alert capability is currently underway and will be available soon. Alerts may be viewed on the Eyes on the Bay website without subscribing to the service as well.

Water Clarity Assessment Presentation (K. Moore)

K. Moore provided background on water clarity assessment using a DATAFLOW system. The link between water clarity and SAV persistence led the EPA to establish water quality criteria for clarity in shallow water areas (generally less than 2 meters). Ken discussed data collection, QA procedures, spatial analysis, and the post processing used to determine attainment.

- Is the current water clarity assessment protocol reasonable for *all* segments? There are several issues related to water clarity assessment:
 - Water clarity assessment is spatially dynamic
 - Does attainment occur in historic SAV areas?
 - The 2.5 multiplier may not be appropriate for all segments
 - B. Michael agreed that this may not be appropriate for all segments, especially in instances of low goals and large water bodies.
 - Available bottom also plays a role in attainment
 - M. Trice stated that not enough available bottom can be a problem in Maryland in shallow water sites; it can be virtually impossible to reach attainment in these areas especially those with high goals
 - The size of the segment affects attainment
 - By choosing the best year out of three, the sample size is small and may not be representative of the actual condition of a segment
 - K. Moore noted that at least 3 years total should be used to determine attainment opposed to the single best year out of three. One year of water clarity attainment does not mean that the designated use will be restored.
- K. Moore suggested several adjustments for assessing water clarity:
 - Refocus on areas where SAV has historically occurred
 - Use a cumulative distribution function (CDF) approach and compare to a biological reference curve
 - Consider if the 2.5 multiplier is appropriate for all segments
 - Use COMMON data to evaluate clarity over time
- How can TMAW continue working on this issue to reach an operational conclusion?
 - P. Tango suggests utilizing the Criteria Assessment Protocols (CAP) Workgroup to address the main issues.
 - Make a concise list of the identified issues
 - Rank issues by priority (as determined by TMAW)
 - Take prioritized list through the CAP Workgroup and the Water Quality GIT
 - Action: L. Hernandez, W. Boynton, P. Tango, and A. Harvey will summarize the discussion and issues identified related to water clarity assessment. The summary will be sent out to TMAW in order to develop a plan to address the issues.

Absolute Status Presentation and Moving Forward (E. Perry & P. Tango)

E. Perry provided background about the development of an absolute status scoring function based on a parametric CDF.

- Ideally, the scoring function should try to identify a distribution on the cusp between “good” and “bad”.
- Very little information is needed to use the scoring function opposed to other scoring indices.
- This method preserves the “shades of grey” in the data.
- The advantages of the absolute status scoring function based on a parametric CDF:
 - Preservation of continuity and ranking of original data
 - Acknowledgement of overlap between “good” and “bad”
 - By scoring data on a universal 0-1 scale, averaging over different scales is possible
 - Scored data have uniform 0-1 statistical distribution under probability integral transform
 - Medians of scored data follow beta distribution
 - Easy to explain through grading on a curve analogy
 - Minimal requirements for specifying reference distribution
 - Has the potential to accommodate context sensitive criteria
- E. Perry used an example from the York River to demonstrate the scoring function.
- P.Tango used an example of previous work done related to chlorophyll and microcystin to provide a basis for why the scoring function as described by Elgin is useful.

Waldbusser et al. Findings Discussion (M. Trice and G. Waldbusser)

M. Trice explained that he had been contacted by a writer from Sea Grant in reference to an article being written for the Chesapeake Quarterly; the reporter was interested in pH data. The request prompted further research into the issue which is when M. Trice came across G. Waldbusser’s paper.

- M. Trice stated that the main concern was related to the papers’ finding of significant pH trends in the polyhaline during spring and summer; the magnitudes of the trends were still within the accuracy of the YSI probes that are used (+/- 2).
 - G. Waldbusser noted the value of pointing out the accuracy of the probes used in this and many monitoring projects; the probes used largely represent the current best available equipment. This demonstrates the need for better carbonate chemistry monitoring equipment.
- Another concern with the manuscript is that the abstract did not mention any of the caveats associated with the monitoring technology and variances in sampling times, etc. that were examined in the discussion section of the paper. Many people do not take the time to read the entire manuscript which can lead to misunderstanding information.
- The Waldbusser et al. analysis of the polyhaline was conducted on areas of the bay with a salinity of 18ppt or higher, unlike most Bay program analyses that use a less variable, segment based approach.
- The manuscript does mention that fluctuations of pH can be seen over seasons and even daily fluctuations sometimes of 1 unit or more.

- Averaging pH directly may be incorrect in terms of averaging a log scale measurement; averaged pH was compared to a method in which pH was converted to hydrogen ion concentration, averaged, and then converted back to pH.
 - M. Trice noted that the MDDNR website was using the same averaged pH method- this has been changed and now MDDNR is averaging hydrogen ion concentrations.
- G. Waldbusser noted that data was grouped by salinity rather than geographic locations because of the strong relationship between alkalinity and salinity; while the observation about a smaller sample size is valid, this method was chosen in order to properly account for chemistry.
- Additional analyses G. Waldbusser conducted on annual pH trends throughout the Chesapeake Bay were presented.
- G. Waldbusser discussed some of the work that he is doing for the state of Washington and with the USDA at the Horn Point Lab, using high precision carbonate chemistry systems for monitoring particularly concerning shellfish and bivalves.
 - Action: G. Waldbusser will send papers about studies in Washington that are examining shellfish and bivalves related to carbonate chemistry to TMAW members that are interested.
 - Action: M. Trice will contact MDE and the fisheries organizations involved in oyster restoration projects about whether or not they'd like to work more on the carbonate chemistry issues that G. Waldbusser described. M. Trice will keep TMAW up to date on any developments.

PIBI Indicators Discussion (J. Johnson)

J. Johnson provided background on the phytoplankton IBI (PIBI). The PIBI is used to determine reference communities based on water quality conditions by season and salinity. The metrics that are applicable to the reference communities are then chosen. By reviewing overall PIBI performance from 1984-2002 (base period) and then 2003-2010; it was concluded that the recent period has been doing well in correctly identifying reference phytoplankton communities and greater phytoplankton communities through most of the salinity regimes.

- With the exception of the degraded sites the index usually performs a bit better in the summer.
- The index reflects flow results well.
- The current bay health indicator index is based on percentage of sites with a PIBI of 3 or less; generally the index averages about 50% of sites passing.
- At many sites phytoplankton is not monitored and is not assessed; therefore the Bay wide number may be deceiving. Phytoplankton programs lost a lot of funding due to the MRAT process and sampling was greatly reduced at the end of 2009. Some sites base assessment off of few samples.

- In tributary stations without a lot of samples a high flow event greatly skews the results for the phytoplankton indicator resulting in elevated PIBI score. This leads to potential misrepresentation during high flow events.
- J. Johnson questioned whether the reporting window for the public PIBI should be changed; should monitoring stations with only 1 sample not get reported?
 - R. Lacouture pointed out that despite sampling frequency, samples taken during high flow events represent what is going on in the system at that point in time.
 - J. Johnson agreed but noted that explaining that to the public is challenging.
 - P. Tango stated that the fault is not necessarily with the indicator but with the communication used to relay the information to the public.
 - E. Perry suggested a comparison of the current year against a historic high flow year or a comparison of a flow adjusted index vs. a non-adjusted index.
 - R. Llanso pointed out that understanding the weather and variability in flow has management implications; the Bay has to be managed in spite of variability.

BIBI Presentation (R. Llanso)

R. Llanso's talk was based upon work done at ODU to examine long term changes in classification efficiency of a BIBI.

- The study found that certain areas experienced a loss of BIBI efficiency, particularly in high salinity waters in small embayments as well as open water areas.
- If the index remains the same but classification efficiency declines, then a change in the underlying community is indicated but the exact cause of the change is not yet known.
- Possible explanations driving the decrease in index efficiency include:
 - Variability in flow, temperature, pH, etc. may play a role in changing the assemblages
 - The community may not have enough time to recover from variable conditions, particularly frequent or intense storms in the spring
 - The types of species could be changing based upon tolerances to factors such as pollution
- These and other hypotheses need to be investigated.

Choptank Synthesis Workplan Overview (W. Boynton & P. Tango)

This agenda item will be moved to the next TMAW meeting due to lack of time.

- Action: W. Boynton will send a summary of the Choptank synthesis workplan and related items to TMAW members for review before the next meeting.