



**Mobile Bay National Estuary Program
Science Advisory Committee Meeting
Killian Room, International Trade Center
250 N. Water Street, Mobile, AL 36602
Friday, June 13, 2014
10:00 a.m. - Noon**

Telecon: 1-888-848-0190 Passcode: 6307392

Tentative Agenda

1. Approval of minutes from the May 16 SAC meeting.
2. Final five-year SAC strategy for the revised CCMP
3. Proposal for Monitoring Plan to the RESTORE Council Funding Priority List? – Bob Howard
4. Chlorophyll a – a potential indicator of Bay health – Ashley McDonald, Dauphin Island Sea Lab (Dr. Just Cebrian's lab)
5. Presentation of the development of a Biological Condition Gradient for Mobile Bay and its watersheds – Tim Thibaut, Barry A. Vittor and Associates
6. Discussion
7. Adjourn

Minutes of the Meeting of the MBNEP Science Advisory Committee (SAC)

Killian Room, International Trade Center

Friday, June 13, 2014

In attendance: Dr. Don Blancher (Restore Ecosystems), Dr. Ruth Carmichael (DISL), Renee Collini (DISL), Marlon Cook (GSA), Mike Dardeau (DISL), Dr. Dennis Devries (Auburn University), Carol Dorsey (AL Dept of Public Health), Patric Harper (US FWS), Steve Heath (ADCNR-MRD-Retired), Steve Jones (GSA), Ashley McDonald (DISL), John Porthouse (NFWF), Tim Thibault (Barry Vittor and Associates), Roberta Swann (MBNEP), and Tom Herder (MBNEP) – via Webex: Dr. Steve Ashby (Northern Gulf Institute) and Dr. Rusty Wright (Auburn University)

Tom Herder started the meeting at 10:00 a.m. and asked that participants introduce themselves. He agreed to change the minutes of the May 16 SAC meeting to reflect Steve Heath's employment status (retired) before securing approval of the minutes.

He displayed a PDF of the final five-year Estuary Status and Trends strategy to be incorporated into the 2013-1018 revised CCMP and said that he would forward a copy of that PDF with the minutes of this meeting.

Bob Howard provided a "heads up" to the SAC about a potential opportunity to develop and obtain funding for a monitoring strategy through RESTORE. He noted that a State Expenditure Plan was being developed and that the RESTORE Council will ask for proposals for the Federal Project List near the end of summer/early fall. He said that he has been working on the GOMA Water Quality Team trying to put together a WQ monitoring plan and that a template for estuarine monitoring has been developed. He feels that there is an opportunity for putting together ideas in a proposal for a 10-year Estuary Monitoring Plan if someone can be identified to take leadership for doing so. It could be marketed for the SEP to be put on the FPL. Bob recommended developing an approach with three levels – a basic level, an intermediate level, and a very comprehensive level – and have it ready for the beginning of fall. Not all of the details would be required for this submission, just development of a conceptual proposal that might be three pages or so long. He expressed the belief that a small percentage of funds could be directed to the development of a 10-year funding strategy.

Mike Dardeau asked if that was what GOMA would try to accomplish at the July meeting, and Bob responded that Steve Wolfe is leaving and that we cannot expect a lot of immediate push over the next couple of months. He feels that GCOOS and GoMERC are more interested in shelf and blue-water monitoring and does not suspect strong interest from the states in blue water. Bob feels that if we and/or others think that we could develop a proposal for monitoring estuarine waters of Alabama, now is a good time to put that proposal together.

Ruth Carmichael asked if ADCNR has a monitoring plan to put forth for the expected federal funding. Tim Thibault responded that they do not. Dr. Carmichael suggested being guided by the Portal. Jon Porthouse responded that NFWF expects monitoring to be engrained in the planning process and not stand alone.

Ashley McDonald assumed the floor with a presentation on potential uses of chlorophyll *a* and dissolved oxygen as indicators of estuarine health. Her presentation was shared with the SAC distribution list after the conclusion of the meeting. In trying to develop drivers of ecological responses and identify any data sets that might be useful, she determined that the most cost effective

and relevant responses to monitor are water quality and benthic indices, which she said are directly related. Other estuaries in other regions use chlorophyll *a* and dissolved oxygen as widely accepted proxies of water quality and coastal health. These indicators are directly correlated to one another, but seasonal fluctuations are common, so seasonal averages are necessary in order to compare annual tendencies over relatively long-terms.

After a comprehensive search of available data for the oligohaline portions of the bay (to better understand waters less influenced by the underlying salt wedge and also the Bays response to its watershed's influence) she identified five data sources from 1989 to the present that included Pennock et. al. (1989-1999), Alabama Coastal Foundation (1991-2005), EPA (2000-2003), McIntyre et. al (2005-2007), and ADEM (2011-2013), all involving either or both DO and chl *a* and light attenuation. However, inference of trends from these data sets is challenging due to problems with compatibility, incomplete sampling sets, and locations.

She recommended confirming current Chl *a* and DO tendencies by resuming monitoring in a manner compatible with Pennock and ACF data, continued monitoring, and interpolation of historic data sets with new ones.

Dr. Carmichael expressed reservations about using these patterns, proven useful in the northeastern U. S., to evaluate the health of estuarine waters along the northern Gulf of Mexico due to the tremendous freshwater discharge that we receive, the natural drivers of low DO here, the FW-driven stratification that occurs here, and top down controls. Dr. Devries expressed agreement.

Both Dr. Wright and Steve Heath agreed that dissolved oxygen is not significant on average and only gains significance when it drops below functional thresholds. Some discussion followed related to the ability of remote sensing data to "retrieve" historical Chl *a* data. Dr. Blancher felt that there is a potential framework set up using current models, given that sufficient data exists.

Tim Thibaut took over with his presentation, Development of Biological Indicators and a BCG Model Framework for the MBNEP Study Area, also shared with the SAC distribution list, towards a MBNEP goal of developing a monitoring program to assess status and trends of estuarine condition. He reviewed the SAC evaluation process of assessing which priority coastal habitats are most impacted by a suite of anthropogenic stressor in delivery of ecosystem services. He noted that the most impacted habitats are coastal wetlands and water courses. He reiterated our direct charge of determining how a stressor gradient of land use change and human disturbance relates to the biological condition of wetlands and coastal waters, with major stressors: land use change, dredging and filling, fragmentation, and sedimentation. He alluded to the relationships between these stressors and their indirect effects that included greater velocity and volume of stormwater runoff and increased loads of nonpoint source pollution.

To establish a monitoring framework, he recommended developing a database that maps where resources are, what their condition is, the stressors that impact them and the degree of stress. This database first requires accurate maps of resources like wetlands or water courses and spatial data before gathering information on their condition.

Tim displayed the schematic of a BCG with a y-axis representing biological condition, an x-axis representing increasing stress or human disturbance, and a curve that falls in an inverse "S" shape from 1, representing that *natural* structure and function of a biotic community is maintained (at the

top of the y-axis) down to 6, representing severe changes in structure and function. When accurately calibrated, a BCG is useful in reporting ecosystem status and trends, identifying restoration and conservation priorities, tracking the effectiveness of ecosystem management measures, and communicating these things to the public. The value of a BCG is in communicating condition and driving decisions. He said that the middle range of the BCG is where finer resolution is required, since we know “really good stuff and really bad stuff.”

He described a tiered framework that divided bio-assessment procedures into three levels which vary in the degree of effort and scale of application:

1. Landscape assessment. This level uses spatial distribution of varying land uses, like impervious surfaces, road densities, development intensity, and percent natural lands, to provide the coarsest level of assessment. Landscape Development Intensity (LDI) indices use these and other factors to represent the cumulative anthropogenic impacts to a landscape unit. Tim used LDI's derived from 2010 CCAP land use/land cover data with appropriate LDI coefficients (higher for greater anthropogenic impact) to demonstrate that the D'Olive Creek HUC 12 is more impacted than the Upper Fish River HUC 12. Wetland classifications from the 2010 Comprehensive Watershed Management Plan were used to graphically demonstrate the correlation of proximity of land use types with higher LDI coefficients to greater degradation of wetland areas.
2. Wetland Assessment Methods. This level uses rapid assessment methods like the wetland rapid assessment procedure (WRAP) used in coastal Alabama to provide sound quantitative information on wetland condition, using condition of wetland vegetation as a key metric with stressor incorporated into assessments. Both the Corps and ADEM use WRAP for wetland assessment, permitting, and mitigation based upon six functional values:
 - Wetland hydrology,
 - Water quality input and treatment,
 - Wetland vegetation ground cover,
 - Wetland overstory/shrub canopy,
 - Adjacent upland/wetland buffer, and
 - Wildlife utilization.WRAP scores of 1.00 to 0.76 reflect high quality, 0.75 to 0.51 reflect medium quality, and 0.50 and below reflect low quality.
3. Intensive Assessment. A Hydrogeomorphic Model (HGM) of tidal marshes uses mathematically-derived indices to assess the capacity of AL fringing tidal marshes to perform ecosystem functions based upon variables like patch size and width, amount of aquatic edge, surrounding land use, fetch exposure, and hydrologic regime alteration. Tim showed values derived from the Arlington Park Wetlands Mitigation Project, which applied a functional capacity index of 0.897 (out of 1.00) to functional capacity units to assess this so-far very successful project.

On a conceptual wetland BCG he developed, Tim adopted Corps and ADEM protocols in reducing the number of condition classes to three: high, medium, and low, with the highest quality representing reference standards wetlands and a minimally-disturbed condition. The assessment area might range from smaller than HUC12s to larger than HUC8s. He demonstrated an example of a 100-acre wetland broken into cohorts of high, medium, and low quality. He weighted each cohort

assigning values of one, two, and three, respectively, then multiplying those factors by calculated proportions of each quality class, then summing, to derive a value for the conceptual wetland of 1.65, falling intermediate between high and medium quality on the S-curve.

Bob Howard asked how this relates to other attributes, like fish health or insect communities. Tim responded that the condition of other communities is strongly correlated to that of wetlands.

Dr. Wright questioned the “high quality” designation, and Time responded that we have abandoned historical references. Through past SAC proceedings, problems with determination of historical condition includes lack of data, lack of relevance, and confidence that reference condition can be recognized or described, regardless of whether or not examples locally exist.

Some discussion of the x axis ensued, since using level of stress was built into the calculation of the quality index.

Steve Heath asked, “What if we get to a value of three and we’re still catching shrimp?” He stressed that this representation of biological condition has to retain importance to people.

Another discussion concerned increases in area of habitat, since with the simple conceptual wetlands BCG, an increase in area with exactly the same proportions would remain 1.65 and not fall to a value reflecting the higher quality expected of a larger habitat area. Alternatively, area could be lost, even filled, and if proportions of the quality levels were preserved, the value would remain at 1.65 and not rise to a level reflecting diminished quality or function.

Mike Dardeau made three comments:

1. He wondered if we lost a tall by removing the X-axis representing stress.
2. He asked whether we could build sea level rise into this framework.
3. He suggested adding area into the calculation of condition.

With the time already past noon, Roberta Swann suggested that we try to meet in a month. She asked if we could get the remaining slides from Tim’s presentation in advance of this meeting.

Tom Herder agreed to forward both PowerPoint presentations to the SAC distribution list and to supply a Doodle poll to ascertain the best possible day for participants in a time period preceding July 21 (after which SAC Chair Mike Dardeau will be unavailable).

The meeting was adjourned at 12:15 p.m.