Mobile Bay National Estuary Program Science Advisory Committee Meeting

January 29, 2021, 10:00 am - 12:00 pm Zoom Virtual Meeting

Agenda

Meeting Objectives:

a) Review SAC's role, goals for the future
b) Review Ecosystem Status and Trends for CCMP
c) Demonstration of tools for habitat classification

1. **Welcome back**
   SAC Co-Chairs:
   Dr. John Lehrter, Dauphin Island Sea Lab Dr. Amy Hunter, ADCNR-RESTORE

2. **Review and Approval of Minutes**

3. **Updates and Presentations**
   a) Why we're here: The role of the SAC within the MBNEP—Dr. Amy Hunter, ADCNR
   b) Overview of CCMP, stated goals and timeline—Dr. Amy Hunter, ADCNR
   c) Review of goals/objectives for Ecosystem Status and Trends
      EST 1: Increasing access to data
      - Updates on DISL data repository-Dottie Byron, DISL

      EST 2: Measuring/monitoring environmental change
      - Implementing the watershed condition framework—Jason Kudulis, MBNEP
      - Stressor evaluation matrix, next steps—Dr. Missy Partyka, MASGC

      EST 3: Modeling connections, providing value
      - Update on the Decadal Study—Dr. John Lehrter, DISL
      - Diversifying the SAC to expand our reach—Dr. Missy Partyka, MASGC

   d) Objectives for this year—Dr. John Lehrter, DISL
   e) Marsh vegetation evaluation tool, Carl Ferraro and Grant Wiseman, Stantec

4. **Adjourn**

Mobile Bay National Estuary Program
Science Advisory Committee Meeting
Zoom Meeting

January 29, 2021

The Mobile Bay National Estuary Program Science Advisory Committee was established to bring area experts together to provide advice, guidance, and recommendations to ensure that MBNEP activities will be conducted in a scientifically relevant and rigorous manner.

In attendance:
Mohammad Al-Hamdan, Chris Anderson, Becky Allee, Steve Ashby, Katie Baltzer, Alex Beebe, Don Blancher, Mary Kate Brown, Dottie Byron, Renee Collini, Newton Cromer, Dennis DeVries, Natasha Dimova, Rich Fulford, Patric Harper, Steve Heath, Kathy Hill, Amy Hunter, Latif Kalin, Jeanette Kelson, Cade Kistler, Jerome Langlinais, Julien Lartigue, John Lehrter, Fred Leslie, Matthew Love, Behzad Mortazavi, Romell Nandi, Scott Phipps, Greg Pierce, Chris Plymale, Melissa Pringle, Evan Reid, Steve Sempier, Eric Sparks, Judy Stout, LaDon Swann, Susan Summerlin, Tim Thibaut, Chris Warn, Byron Webb

MBENP Staff: Jason Kudulis, Roberta Swann, Missy Partyka

This meeting was held remotely due to the COVID-19 pandemic.

Dr. John Lehrter called the meeting to order at 10:04 CST. Minutes from the August 12th meeting were shared via email. Dr. John Lehrter made a motion to accept the minutes. Dr. Missy Partyka seconded.

Dr. Lehrter began by overviewing the agenda and was followed by Dr. Amy Hunter reviewing the purpose and role of the SAC within the CCMP.

Dr. Partyka gave an overview of the **Ecosystem Status and Trends matrix**, emphasizing specific goals/objectives and the timelines associated with them.

Subsequent presentations were given addressing key objectives, beginning with **EST-1 "Increase availability and use of data related to how coastal ecosystems and their services respond to man-made stresses".**

Following the EST-1 overview, Dottie Byron, DISL, gave an update on **Data Management at DISL and the Alabama Center of Excellence.**

Key take-aways from the presentation include:

- Public access to data is a mandate of the DISL ALCoE governed by F.A.I.R. guiding principles.
    - Data must be F.A.I.R. Findable, Accessible, interoperable, and Re-usable.
- DISL ALCoE are taking several steps to adhere to F.A.I.R. principles.
    - Findable: Issuing and registering DOIs, joining Lyrasis, allowing tracking of data usage by others. Bids being drafted to host data on DISL webpage, including new metadata

portal.
    - Accessible: Data stored as ISO metadata, archived with NOAA NCEI to exist in perpetuity and more easily discovered.
    - Interoperable: Metadata stored as simple text files to avoid proprietary software needs.
    - Re-usable: Using ISO standard formats, communicating with other repositories to understand best practices, and all data will eventually be under the Creative Commons license (by attribute and share alike).
- DISL working on a work-flow to get buy-in from scientists outside of MBNEP to contribute data to the ALCoE.

Next Dr. Partyka gave an overview of status and goals of **EST-2 "Establish a process of measuring, analyzing, and communicating change in marine, estuarine, and freshwater ecosystem conditions."**

Following the overview, Mr. Jason Kudulis discussed the status of the **Watershed Condition Index and Monitoring Framework**.

Key take-aways include:

- WCI/MF have already been utilized in the D'Olive watershed.
- The MBNEP wants SAC to think about using this framework to assess specific restoration goals in other watersheds, as outlined in EST-2. They will need some participation from the SAC to move forward with refining the process.
- The MBNEP also needs help to communicate the outcomes of restoration activities and will be soliciting the SAC in the future.

Jason's discussion was then followed by an update on the **Stressor Evaluation Matrix** by Dr. Partyka.

Key take-aways include:

- There will be two types of Stressor Evaluation Matrix moving forward.
    - One used as rapid response, for emergent issues that need quick answers. SAC will be polled to determine habitats and species of particular concern and potential interacting stressors.
    - The second version will be more in-depth, emulating the DIPSR approach. Will use structured decision making to fully explore interacting stressors with a quantitative outcome.
    - Sub-committee will be created to help develop this secondary matrix tool.

Dr. Partyka next gave an overview of status and goals of **EST-3 "Model and predict connections between ecosystem condition and the ecosystem services people value."**

Following the overview, Dr. Lehrter gave an update on the decadal study, "**Building Resilience for Oysters, Blue crabs, and Spotted seatrout (OyBcSt) to Environmental Trends and Variability in the Gulf of Mexico"**.

Key take-aways include:

- The "Decadal Study" is funded from 2019-2024, with possibility of 5-yr extension.

- Study focuses on iconic species in Mobile Bay, oysters, blue crab, and speckled trout.
    - All three are important and all three are in decline, oysters the worst of the three. Purpose of project to identify causes of decline.
- 5 major themes: 1) Document change using available data, new field monitoring, new numerical modeling. 2) Establish thresholds for species, e.g., when stressors are multi-fold how does that change outcomes? Work is ongoing at DISL in new experimental wetlab (new funding!) 3) Ecosystem services and resource utilization, working with economists at MSU. 4) Environmental scenarios and predictions, numerous trends impacting the Gulf. 5) Large outreach and transfer component directed toward needs of partners. The intention is to take models out of modelers hands and put them into the users.
- DPSIR approach will be used (with assistance of SAC) to make stressor interactions quantitative. Will be putting all of these models together to generate scenarios and predictions.
- Updates:
    - Climate downscaling using machine learning to reduce biases and improve output accuracy. New algorithm has greatly improved usefulness of earth system models for the Mobile Bay region.
    - Mobile river basin model: Basin split into three sub-watersheds. Model will give discharge of the subwatersheds, based on the last 4 decades of data, to make predictions for the future.
    - Bay model: High-resolution spatial model with 16 numerical layers. Computation requires use of super computers (requires additional funding). Currently being used to model the physical stratification of water from the Gulf into the Delta. Beginning model validation with monthly surveys to measure seasonal patterns.

Dr. Partyka then briefly discussed the **need to expand the SAC** to have greater involvement of members of the social sciences, including sociologists, economists, and public health researcher, to tie restoration outcomes more closely to the values of impacted communities. She solicited nominations and contact information from current SAC members.

Next, Dr. Lehrter presented on the **Goals of the SAC for 2021**

Primary goals:

- Review of the Watershed Condition Index;
- Engage in next round of the Stressor Matrix using the DPSIR approach;
- Provide feedback on the model outcomes of the Decadal Study;
- Work to diversify the scientific expertise of the SAC; and
- Improve involvement of SAC members in accomplishing goals within EST.

May be able to show updates of current projects and feature outcomes in upcoming newsletters and on the Alabama Coastal Restoration website in order to more broadly advertise work being done.

The final presentation was given by Mr. Carl Ferraro and Mr. Grant Wiseman on **Remote Sensing: Habitat and Water Quality Mapping & Analysis**

Key take-aways include:

- There are multiple benefits to the use of remote sensing techniques for habitat monitoring.
- Constellations of small ‘dove’ satellites provides for cost effective, high-resolution (50 cm)

imagery that allows for tracking of multiple parameters (e.g., subsidence, uplifting, water quality).

- New strategies using Artificial Intelligence allow for the fusion of low-frequency high-resolution imagery with high-frequency low-resolution imagery in order to develop more in-depth water quality monitoring tools.
- These tools are harder to utilize in highly turbid environments, but AI data fusion techniques allow for the imagery to be calibrated with physical water quality measurements, thereby improving accuracy, including visualization of chlorophyll data.
- Dr. Lehrter mentioned that development of a remote sensing strategy is included in the EST, so discussion of use of these remote sensing approaches to continue.

Next meeting will be Friday May 21 at 10 am CDT. MBNEP Annual Meeting is TBD.

At 11:59 am, Dr. Partyka made a motion to adjourn. Dr. Lehrter seconded.