Functional Marsh Metrics for HEA

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Four questions were posed…

- *What metrics or methods related to ecosystem function are new or on the horizon that merit further evaluation?*
- *What are the limitations or advantages of metrics or methods related to ecosystem function that have been used previously in HEA models?*
- *How does the idea of "baseline" and inherent ecological variability over short- and long-term time scales affect the identification and utilization of measurements of ecological function in HEA models?*
- *How does the regulatory context (CERCLA vs. OPA) affect the answer to the three questions above?*

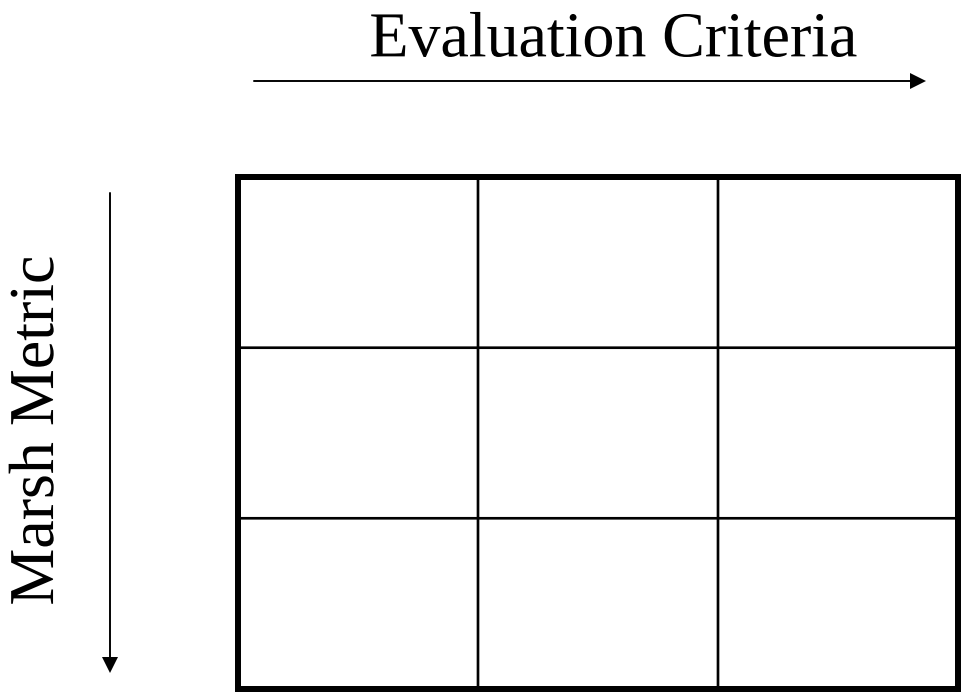
Proposed Pathway to Answer Workshop Questions

- *Provide read-ahead materials to reduce start-up time within groups*
- *Enable five breakout groups to independently evaluate HEA metrics, but provide opportunity for cross-pollination*
- *Embed OC members and recorders within each group so participants can focus on problem-solving*
- *Allow technical experts opportunity to impart experience*
- *Provide participants the opportunity to prioritize metrics*
- *Periodic "report outs" by the groups over several days*

Desired outcomes…

- *A matrix will be iteratively developed over the course of the workshop to capture the key outcomes of workshop discussions*
  - *Issues associated with incorporating multiple measures of ecological function and/or uncertainty into the HEA model will be identified, ranked or categorized, and qualitatively evaluated*
- *Summarize key findings in a report or manuscript*

Matrix of Marsh Metrics Concept



Abridged List of Marsh Metrics for HEA (Selected from Pre-Reading)

Biological

- *Aboveground vegetative productivity*
- *Belowground vegetative productivity*
- *Benthos abundance/density*
- *Fish and shellfish abundance/density*

Soil/Sediment

- *Sediment Toxicity*
- *Sediment Contamination*
- *Sediment Grain Size*

Chemical

- *Organic matter content*
- *Redox potential*
- *Chemical profile of water or porewater*

Hydrological

- *Tidal dynamics*
- *Wave energy quantification*
- *Water depth*

Evaluation Criteria for Marsh Metrics

- *Measurement Difficulty*
- *Suitable Baseline Data Available*
- *Natural Variability*
- *Sensitivity to PAH & Oils*
- *Sensitivity to Inorganics*
- *Sensitivity to Pesticides/PCBs*
- *Computational Difficulty*
- *Cost*
- *Metric Accurately Reflects Service Loss*
- *Metric Useful for Scaling Restoration*

Workshop Matrix of Metrics

- *Current form of Matrix as a starting point only*
- *Level of detail up to individual breakout groups*
- *Flexibility + Autonomy + Creativity => Anarchy?*
- *By Thursday, each group to produce final Matrix of Metrics*
- *Final matrices will be used to identify significant issues and capture group input*
- *Ability to integrate matrices at end will depend on their composition*
- *Be patient with recorders*

Technical Marching Orders to Workgroups

- *Keep "function" in mind with respect to HEA (i.e., service losses & gains), but sometimes structural metrics may be important too*
- *Agreement, disagreement, & neutrality equally important to capture*
- *Feel empowered to make changes to starter materials*
- *Identify metrics' relevance to existing LTM datasets, if possible*
- *Stay focused on marsh habitat, but think broadly across habitat types too*
- *Spatial scale, time, variability, statistical rigor, regional differences, trade-offs, regulations/statutes, HEA constructability all important*
- *Consider whether metrics are suitable for injury or restoration or LTM or any combination thereof*