Progress and challenges in up-scaling carbon modeling to a regionally significant wetland-estuary system

GOAL: Develop a modeling system to explicitly estimate wetland DOM flux and the processes that govern it

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National Wetlands Inventory database
Wetlands and Estuaries have distinct processes that contribute to the DOM distribution and flux.
RhodeFVCOM-ICM
Small-scale, well constrained system to develop and parameterize new model components
Results: RhodeFVCOM-ICM

Difference between runs with photodegradation (full model) and without photodegradation
Results: RhodeFVCOM-ICM
Next Step: Scaling up to the Blackwater and Nanticoke River Ecosystem

Experiments and Observations

Small-scale simulations
In well constrained systems

Idealized Modeling Scenarios

Scale Up to large scale model domain

NASA Earth Observatory
Can we represent DOM reactivity well enough?
- Why is DOM reactivity different and can a single coefficient for each pool capture that?
  - DOM Composition, redox conditions, microbial community, metabolism
- Plant community composition within the wetland can be important: limit complexity but still successfully capture redox/ biogeochemical conditions

Next Step: Scaling up to the Blackwater and Nanticoke River Ecosystem