Conowingo II – Field/Lab Measurements and Modeling

UMCES

Note – Contract Being Worked On, Subject to Changes!

Conowingo Pond Questions

1. Can we ignore nutrient regeneration within the pond? Does it matter if the particles are in the pond or in the estuary since nutrient regeneration occurs in both places?
2. How reactive are the particulates in the bottom sediments? Are bottom sediments more or less reactive than the particles crossing the dam under low to moderate flow? Note – N and P chemistry have very different controlling mechanisms

Upstream Inputs

- Inputs to Conowingo Pool – P Characterization
- N and P release during decomposition experiments

Conowingo Dam Particulate Efflux

- Particle settling behavior
- Form and potential reactivity of P
- Decomposition experiments to assess N and P bioavailability

Reservoir Processes

<u>Biogeochemistry</u>

- Net exchange of N and P
- Pore water/solid phase characterization
- Spatial distribution of organic matter reactivity
- Grain size, porosity, non-reactive carbon (coal)

Impact on Bay Processes

<u>Biogeochemistry</u>

- P release as a function of salinity/redox
- N decomposition rates
- SFM modeling of results

<u>Transport/Deposition of Particulates</u>

- Event-based sampling of particle distributions and physical forcing
- Radionuclide identification of “new” deposits
- Modeling of particle sedimentation

Proposed Project

- USGS/Exelon/DNR – yield and character of particulates entering/leaving reservoir. High/low flows, scour, etc……
- Cornwell – Reactivity of reservoir, suspended sediment inputs and outputs, sediment-water exchange in reservoir and bay (experiments)
- Sanford – Settling behavior of material leaving Conowingo Dam
- Palinkas – short-lived nuclides to identify flood deposits in bay
- Testa/Kemp – sediment flux modeling of reservoir and bay nutrient biogeochemistry
- Ming Li – ROMS model of sediment deposition in upper bay