Management Effects on Water Quality Trends

Workgroup Outcomes

- Enhance trend detection methods
- Identify information needed to better explain trends
- Suggest quantitative approaches to explain water-quality trends in Chesapeake Bay and its watershed

Enhance trend detection methods

- **"New" methods appropriate but…..**
  - **Other tools to analyze sites with "less data"**
  - **Amount of effort to interpret, evaluate application**
- **Future possibilities**
  - Look at overall similarities or differences in trends
    - Synchronistic behavior between sites (spatial and over time).
    - "Selective" choices on where to explore responses
  - Evaluate different techniques (who and comparing)
    - Hieratical framework
    - ARIMAM approach
    - Empirical Orthogonal Function Analysis

Information needed to better explain trends

- **Sources:**
  - County scale; may need finer resolution.
  - **Improved time series for some sources**
  - **Inputs below "fall line"**
- **BMPs**
  - **Number implemented**
  - **How effective and how they behave in landscapes**
  - **Effectiveness over time**
- **Physical/Biogeochemical**
  - **Groundwater characteristics**
  - **Changes in ecological influences (fisheries)**
  - **Stormwater diversion and urban development**

Quantitative approaches to explain water-quality trends

- Multiple models needed based on scale being address
  - field scale models, watersheds, and entire basin.
  - Addressing finer scale needs and small watershed results
- Hieratical modeling approach.
  - Probabilistic estimate of BMPs and model parameters
  - Include more detailed information on physical factors
  - “Space for time” approaches (SERC and STAC).
- SPARROW model
  - Test BMPs and other process “variables”
  - Dynamic SPARROW explore storage (GW), change
- “Regime” shifts and effect on water-quality response
- Socio-economic consequences

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Considerations

Addressing multiple scales

- “regional” patterns
- “local” results

Quantifying system response

- Time for improvements
- Enhance models

Communicating results

- BMPs
- Ecosystem improvements
- Multiple products