Measuring and Explaining Trends in Water Quality

USGS and CBPO Trends Teams

CBP Water Quality Goal Implementation Team Conference Call

Oct. 13, 2015
Using Monitoring Data To Measure Progress and Explain Change

**Relationships**
- Relate changes in tidal water quality to attainment of WQS
- Relate changes in tidal water quality to trends in N/P/S loads
- Relate trends in N/P/S loads to anthropogenic factors

**Trends**
- Quantify changes in attainment of water quality standards
- Quantify changes in water quality in mainstem and tidal tributaries
- Quantify changes in loads of N/P/S to rivers and Bay

**Processes**
Incorporate insights from collaborating research efforts, literature, and new analyses
Using Monitoring Data To Measure Progress and Explain Change

Outline

- A brief primer on trends in loads from the watershed
  
  Doug Moyer and Joel Blomquist (USGS)

- Quantifying and explaining Trends with Generalized Additive Models (GAMs)
  
  Rebecca Murphy (UMCES-CBPO)

- Incremental progress towards attainment of Water Quality Standards
  
  Melinda Ehrich (UMCES-CBPO)

Quantify changes in loads of N/P/S to rivers and Bay

Quantify changes in water quality in mainstem and tidal tributaries

Quantify changes in attainment of water quality standards
## Using Monitoring Data To Measure Progress and Explain Change

### Timeline

<table>
<thead>
<tr>
<th>Date and Period</th>
<th>Activity Description</th>
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<tr>
<td><strong>December 2015</strong></td>
<td>Release trends in nutrient and sediment loads for nontidal monitoring stations</td>
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<tr>
<td><strong>June 2016</strong></td>
<td>Finalize summary of patterns in water-quality criteria attainment over time in tidal waters from 1985-2014</td>
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<td><strong>Annually, beginning in 2016</strong></td>
<td>Implement new process for quantifying trends in tidal water-quality parameters, incorporating advances in methods to provide more information on changes over time (UMCES/EPA, MD DNR, VADEQ)</td>
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<td><strong>Ongoing 2016-2017</strong></td>
<td>Provide updates of nutrient and sediment load trends in the watershed to help assess progress toward implementing the Bay TMDL. Updates of loads at the River-Input Monitoring stations will be provided annually with results from additional stations in the nontidal network provided every two years (USGS working with States and EPA).</td>
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<td><strong>Ongoing 2016-2017</strong></td>
<td>Continue to explain watershed trends of nutrients and sediment to support the Mid-Point Assessment. The effects of nutrient sources, land-use change, and BMPs will be investigated and presented for the watershed and several major source sectors (agricultural, urban, and atmospheric deposition). (USGS, EPA, and academic partners working through the Scientific, Technical Assessment, and Report (STAR) team.)</td>
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<td><strong>Ongoing 2016-2017</strong></td>
<td>Continue to develop and apply new approaches for quantifying and explaining water-quality trends in tidal waters</td>
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<tr>
<td><strong>Ongoing 2016-2017</strong></td>
<td>Test watershed factors influencing water-quality trends in tidal waters</td>
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Feedback

1. Is this the level of technical information that you’d like to see?

2. Are there questions that you have about trends in water quality that you do not see addressed by this process and the results that we plan to generate?
   
   • Some of this may be due to the level of detail that we’re presenting here.
   
   • We can use your feedback to target content for future presentations