Regional Monitoring Networks (RMNs): Why we’re discussing field protocols

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National Water Quality Monitoring Conference Field Protocols Workshop

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Office of Research and Development
Air, Climate and Energy Program, National Center for Environmental Assessment

May 4, 2016
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30-8:45</td>
<td>Background on RMNs</td>
</tr>
<tr>
<td>8:45-9:00</td>
<td>Protocols for collecting continuous temperature data</td>
</tr>
<tr>
<td>9:00-9:20</td>
<td>Protocols for collecting continuous hydrologic data, using pressure transducers</td>
</tr>
<tr>
<td>9:20-10:00</td>
<td>Installing sensors</td>
</tr>
<tr>
<td>10:00-10:30</td>
<td>Break</td>
</tr>
<tr>
<td>10:30-11:00</td>
<td>Elevation surveys</td>
</tr>
<tr>
<td>11:00-11:30</td>
<td>Lessons learned</td>
</tr>
<tr>
<td>11:30-12:00</td>
<td>Equipment considerations</td>
</tr>
</tbody>
</table>
Working with EPA Regional offices, states, tribes and other biomonitoring programs in the Northeast, Mid-Atlantic, Southeast & Midwest

Sampling efforts began in the Northeast in 2012, followed by the Southeast in 2013, the Mid-Atlantic in 2014, and parts of the Midwest in 2016.
Detect potentially small, **climate-related trends** at a **regional scale**, in a **decision-relevant timeframe**, in the context of routine biomonitoring.
How Will We Achieve This Goal?

• Sample at least **30 sites with similar environmental and biological characteristics in each region**
  • Average 5 sites per state (range: 1-15)
  • Site selection informed by stream classification and expert judgement
  • Design informed by power analyses on Northeast dataset (2012)

• Sample on an **annual basis for 10 or more years**, using as **consistent and comparable** methods as possible (QAPP)

• Initial focus is on **freshwater wadeable streams – one class**
  • Expand to other stream classes
  • Add inland lakes and wetlands
Data Collection Targets

- **Biological**: macroinvertebrates.
  - Optional: fish and periphyton
- **Temperature**: year-round water and air temperature
- **Hydrologic**: year-round water level data (from USGS gages or pressure transducers), ideally converted to discharge.
- **Habitat**
- **Water chemistry**
How the RMNs Currently Function

- Integrated into existing bioassessment programs, and supplement these programs
  - Where feasible, RMN sites are part of established long-term monitoring networks and are co-located with USGS gages

- Regional coordination = pooled resources + increased efficiencies

- Pool the data at regional scale
  - Enable more robust analyses
  - Improve ability to detect climate-related trends over shorter time periods

- Involvement is voluntary
  - Needs to fit within resource constraints of participating agencies
The RMN report

- Describes development of RMNs in Northeast, Mid-Atlantic, and Southeast
- Site selection
- Data collection and QA/QC procedures
- How to summarize and share the data
- Examples of how the data can be analyzed and used

Available online: https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=307973&CFID=60022322&CFTOKEN=41072377

Hard copies available upon request (contact Britta - Bierwagen.Britta@epa.gov)
Objectives of Today’s Workshop

• Go through the field protocols used to collect continuous thermal and hydrologic data at RMN sites.

• Help build capacity and improve quality of continuous thermal and hydrologic data, using temperature sensors and pressure transducers.

• Cover simple methods & inexpensive tools for collecting thermal and hydrologic data sustainably over the long term
Continuous Data

- Sensors & sondes have become more affordable
- Can be deployed year-round, seasonally, etc.
- Can measure single or multiple parameters – temperature, water level, DO, conductivity, turbidity, pH, nutrients
- Can be set to record measurements at desired intervals (15-minute, 30-minute, etc.)

Many different equipment options!
Continuous Data

Capture natural temporal patterns, episodic events and spatial variability, which may be missed by limited numbers of discrete measurements.
Continuous Data

Many different aspects to collection of high quality continuous data:

- Proper equipment
- Accuracy checks
- Sensor configuration
- Sensor placement
- Installation techniques
- Documentation
- Maintenance
- Data retrieval
- Data processing
- Data storage
RMN partners have varying levels of experience with continuous sensors

Report facilitates more uniform and effective deployment of continuous temperature and water-level sensors at ungaged sites in wadeable streams

Collaborative effort –
EPA, Tetra Tech, MA RIFLS, USFS, USGS

https://cfpub.epa.gov/ncea/global/recordisplay.cfm?deid=280013

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Workshop Agenda

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QUESTIONS? COMMENTS?

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