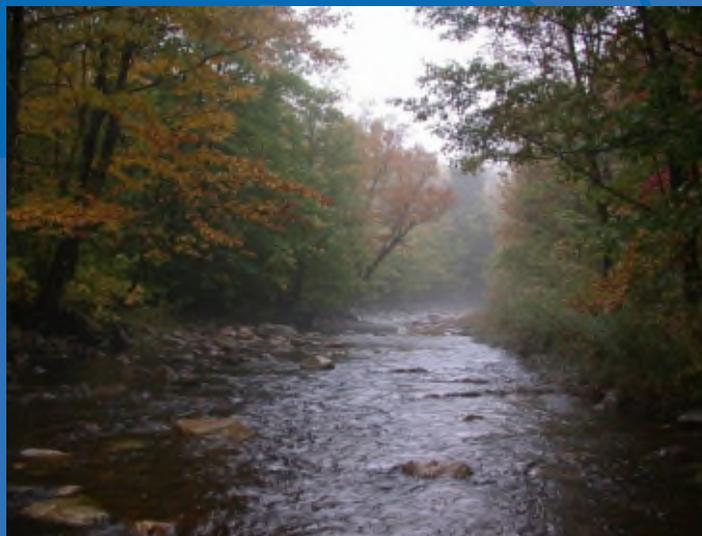




Regional Monitoring Networks (RMNs): Why we're discussing field protocols



National Water Quality Monitoring Conference Field Protocols Workshop

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The views expressed in this presentation are those of the author and they do not necessarily reflect the views or policies of the U.S. Environmental Protection Agency or other collaborating agencies

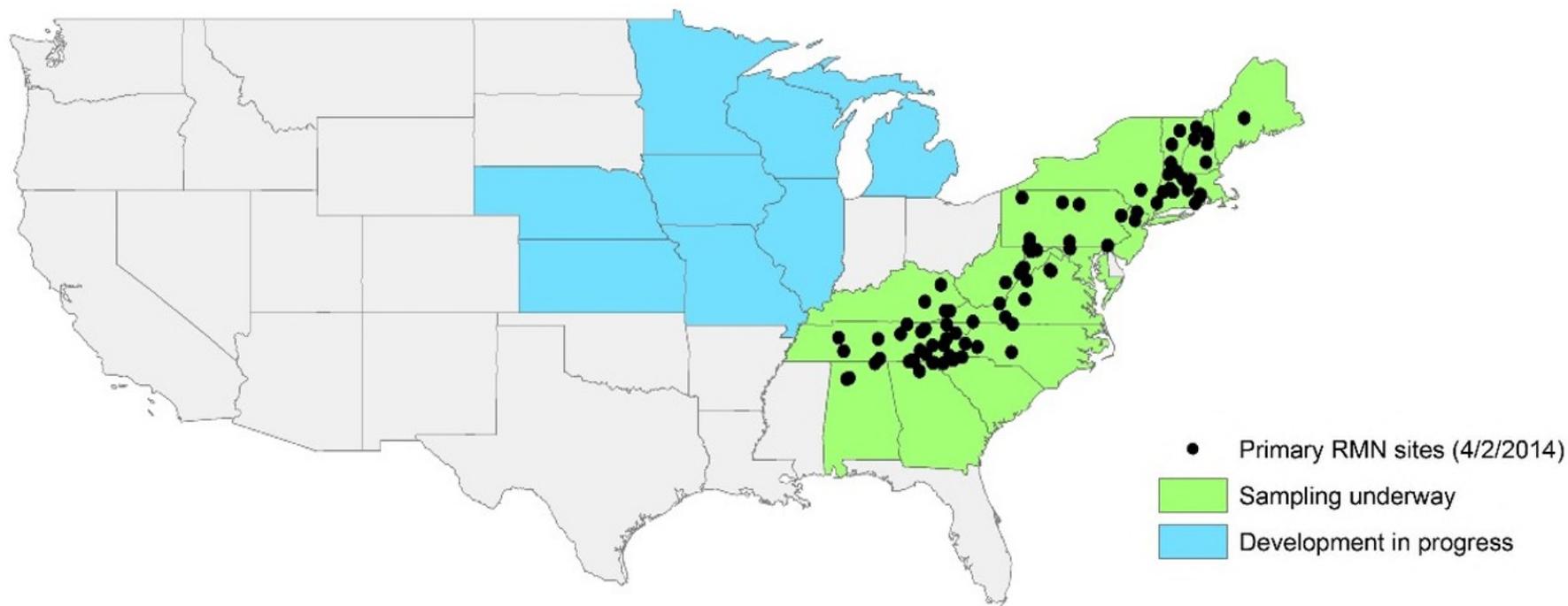


Workshop Agenda

- 8:30-8:45** Background on RMNs
- 8:45-9:00** Protocols for collecting continuous temperature data
- 9:00-9:20** Protocols for collecting continuous hydrologic data, using pressure transducers
- 9:20-10:00** Installing sensors
- 10:00-10:30** Break
- 10:30-11:00** Elevation surveys
- 11:00-11:30** Lessons learned
- 11:30-12:00** Equipment considerations

Background on Regional Monitoring Networks (RMNs)

Working with **EPA Regional offices, states, tribes** and other biomonitoring programs in the **Northeast, Mid-Atlantic, Southeast & Midwest**





Goal of Regional Monitoring Networks (RMNs)

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

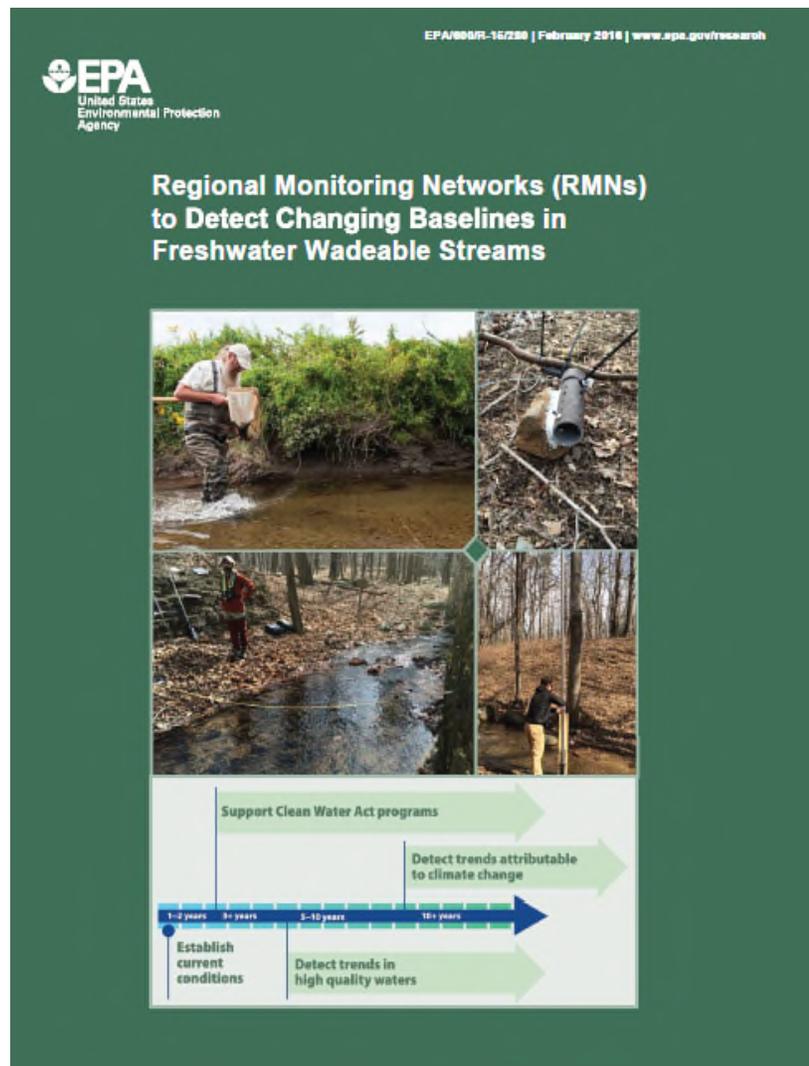


- **Biological:** macroinvertebrates.
 - Optional: fish and periphyton
- **Temperature:** year-round water and air temperature
- **Hydrologic:** year-round water level data (from USGS gages or pressure transducers), ideally converted to discharge.
- **Habitat**
- **Water chemistry**

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/recorddisplay.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

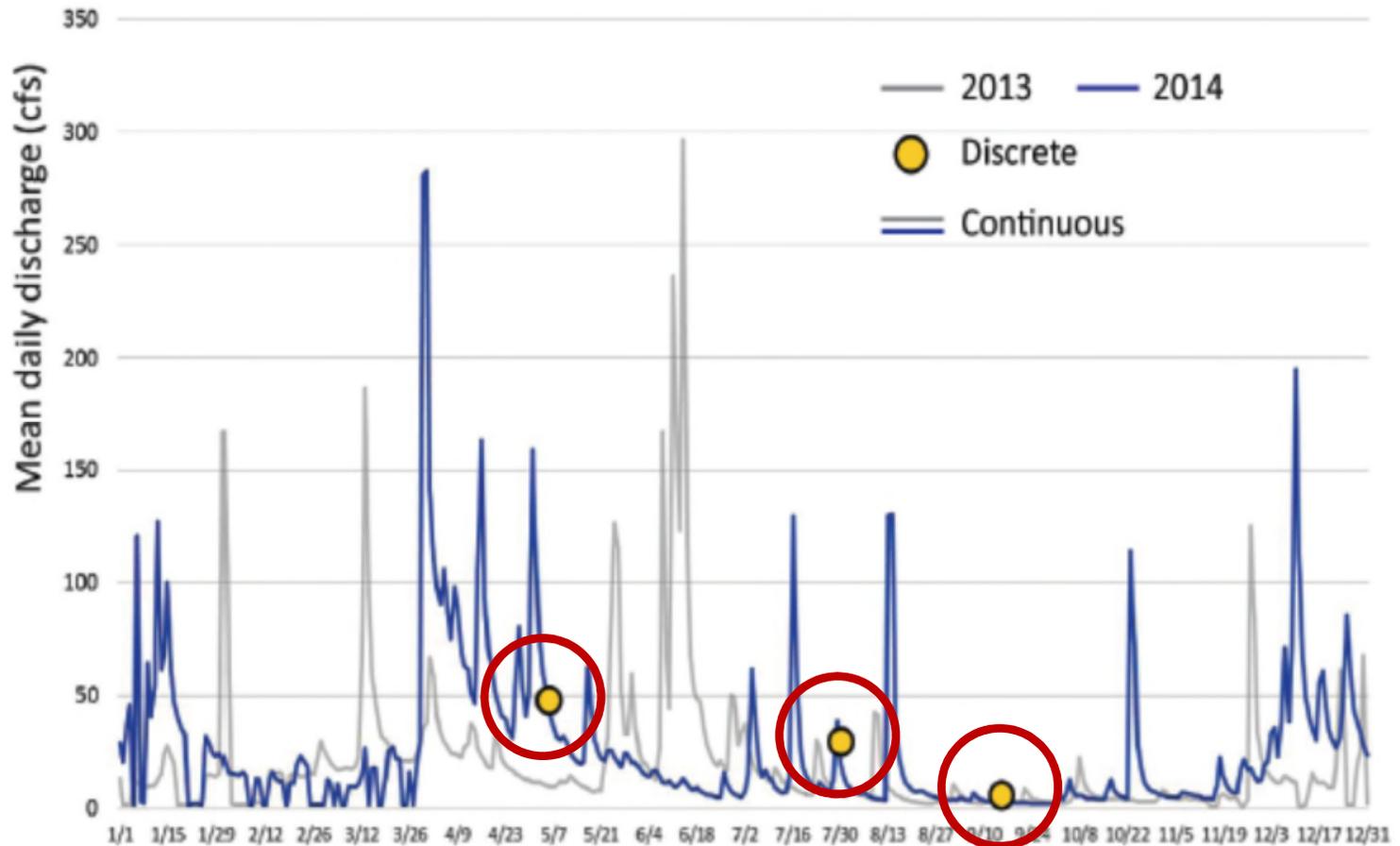
- Sensors & sondes have become more affordable
- Can be deployed year-round, seasonally, etc.
- Can measure single or multiple parameters –
temperature, water level, DO, conductivity, turbidity, pH, nutrients
- Can be set to record measurements at desired intervals (15-minute, 30-minute, etc.)



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



Many different aspects to collection of high quality continuous data:

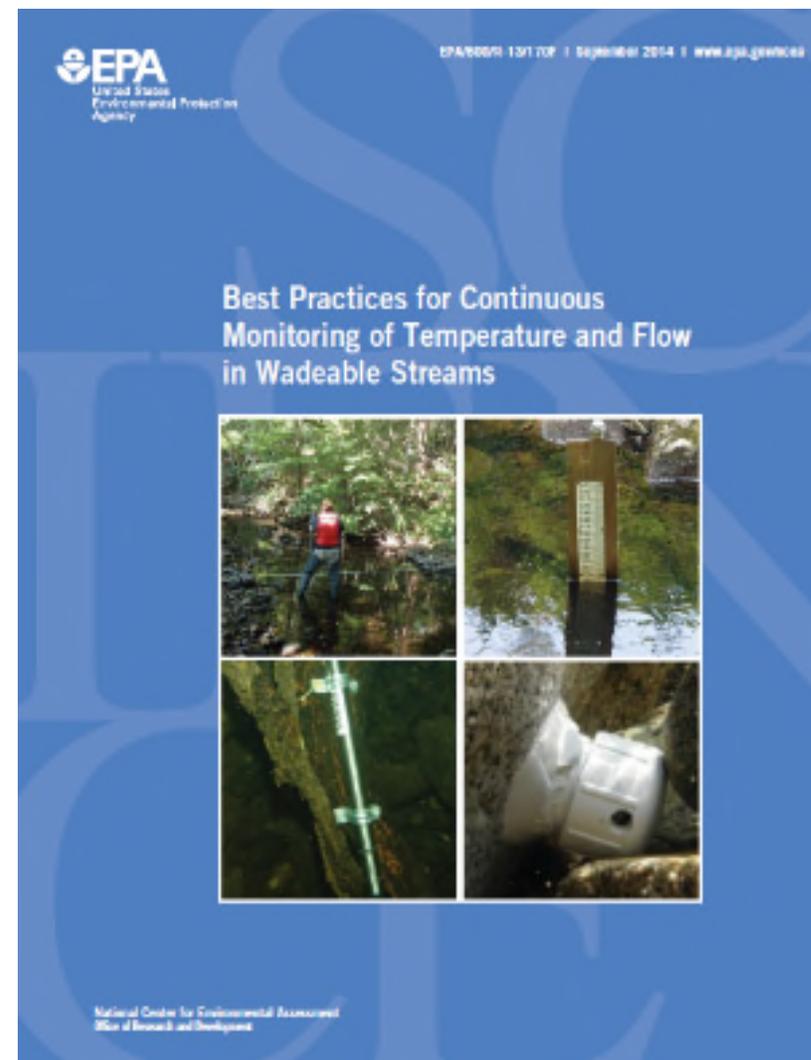
- Proper equipment
- Accuracy checks
- Sensor configuration
- Sensor placement
- Installation techniques
- Documentation
- Maintenance
- Data retrieval
- Data processing
- Data storage

“Best Practices” report

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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QUESTIONS? COMMENTS?



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