

Office of Research and Development

# SAFE AND SUSTAINABLE WATER RESOURCES RESEARCH PROGRAM



The background of the slide is a photograph of a calm, blue lake. In the distance, a dense forest of tall, thin trees lines the shore, with some trees showing early autumn colors. The sky is not visible, as the trees fill the upper portion of the frame. A dark green diagonal shape is overlaid on the right side of the image, containing the title text.

# SSWR Research Program Vision

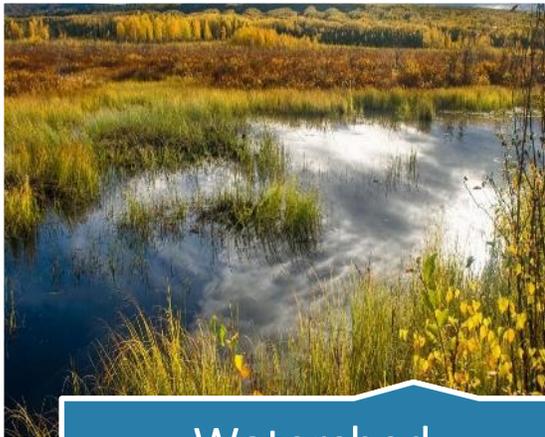
*The SSWR research program uses an integrated, systems approach to support innovative scientific and technological solutions that ensure clean, adequate, and equitable supplies of water to protect human health and to protect and restore watersheds and aquatic ecosystems.*

## Stressors

Extreme weather events, land use, aging infrastructure, population change

## Sustainability

Environmental, Economics, Social



Watershed  
Sustainability



Nutrients



Green Infrastructure



Water Systems

# Main Topic Activities

Advancement of integrated water resource and watershed management approaches, models, and decision-making tools that ensure sufficient supplies of clean water to support economic, environmental, and public health requirements.

# Statutes Supported

- ❖ CWA § 1251. Congressional declaration of goals and policy
- ❖ CWA § 1252. Comprehensive programs for water pollution control
- ❖ CWA § 1254. Research, investigations, training, and information
- ❖ CWA § 1257. Mine water pollution control demonstrations
- ❖ CWA § 1266. Hudson River reclamation demonstration
- ❖ CWA § 1267. Chesapeake Bay
- ❖ CWA § 1273. Lake Pontchartrain Basin
- ❖ CWA § 1274. Watershed pilot projects
- ❖ CWA § 1314. Water quality criteria development
- ❖ CWA § 1315. State reports on water quality
- ❖ CWA § 1321. Oil and hazardous substance liability

# Watershed Sustainability





## 2016-2019 Research Projects

Assess, Map, and Predict the Integrity, Resilience, and Restoration Potential of the Nation's Water Resources \*\*\*NARS

Science to Support New or Revised Aquatic Water Quality Criteria to Protect Human Health and Aquatic Life – Pathogens, Chemicals and CEC

## Main Topic Activities

Improve the science needed to define appropriate nutrient levels and to develop technologies and management practices to monitor and attain appropriate nutrient loadings.

Provide information and tools that improve the ability of local, state and national stakeholders to manage the risks posed by HABs.

## Statutes Supported

- ❖ CWA 33 U.S. Code Chapter 26, Sections 1251-1387
- ❖ CWA 33 USC CHAPTER 53, Section 4001—Harmful Algal Bloom and Hypoxia Research and Control
- ❖ SDWA 42 U.S. Code, Chapter 6A, SUBCHAPTER XII—Safety of Public Water Systems

### **SDWA Contaminant Candidate List**

- ❖ The Office of Water has listed cyanobacteria and cyanotoxins on the CCL 1 (1998), CCL 2 (2005) and based on toxicological, epidemiology and occurrence studies, included specifically anatoxin-a, cylindrospermopsin, and microcystin-LR, on CCL 3 (2009) and the CCL 4 (2016)



Reducing Impacts of Harmful Algal Blooms

Science to Inform the Development of Nutrient Thresholds and Targeting Actions

Science to Improve Nutrient Management Practices, Metrics of Benefits, Accountability and Communication

## Cyanobacteria Assessment Network



### Problem

How to detect and quantify algal blooms to protect use of U.S. lakes and estuaries?

### Action

Create a standard and uniform approach for identification of algal blooms using satellites.

### Result

New methods to quantify algal bloom frequency and extent.

### Impact

- Applied novel sophisticated tool to assist in management of events that may involve significant risk to the public.
- Improve resource allocations and reduce exposures

<https://www.epa.gov/water-research/cyanobacteria-assessment-network-cyan>

### Statutes: HABHRCA, CWA, SDWA

- HABHRCA - EPA responsible for monitoring of HABs in freshwater.

### EPA niche

- Satellite application methods for freshwater HAB & water quality management.

### External engagement

- Regions 4,5,6,7,8,9,10 RTAGs and HAB workshops with states.
- CONUS cyanoHAB satellite data delivered to OW, Regions & states, with webinar trainings.

### Example applications

- Developed methods to quantify cyanoHAB frequency & extent.
- Each year EPA could report on status of cyanoHABs in U.S. resolvable lakes.

## Main Topic Activities

Develop and evaluate data, approaches, and technologies that will support the promulgation and implementation of federal water regulations and guidance, while also addressing regional, state, and community issues of concern.

Optimize water treatment and maximize resource recovery and system resiliency.

Develop and demonstrate best practices and tools for managing stormwater volume and improving water quality, and assess their feasibility.

## Statutes Supported

- ❖ CWA 33 U.S. Code Chapter 26, Sections 1251-1387, 1274, 1342
- ❖ CWA § 1254. Research, investigations, training, and information
- ❖ CWA § 1274. Wet weather watershed pilot projects (Stormwater)
- ❖ CWA § 1311. Effluent limitations
- ❖ SDWA 42 § 300g-1: National drinking water regulations
- ❖ SDWA § 300g-1. National drinking water regulations; (4) Goals and standards
- ❖ SDWA § 300j-1. Research, technical assistance, information, training of personnel



## Green Infrastructure

- Models and Tools
- Community Partnerships

## Drinking Water, Wastewater & Reuse

- Current Systems and Regulatory Support
- Next Steps: Technology Advances
- Transformative Approaches and Technologies

## **Key Past Research Accomplishments**

- National Stormwater Calculator (NSC)-Development of cost/benefit component
- Storm Water Management Model (SWMM)- Application at watershed-scales
- Performance assessments of GI/low impact development systems (permeable pavement, rain gardens, swales)
- Urban soil characterization for improving GI implementation

## **Key Present/Future Research Deliverables**

- SWMM-Addition of Geographical Information System (GIS) interface
- Focused assessments of urban GI on water quantity and quality



# National Priorities and STAR Grants — Infrastructure

RFA  
Jun-Aug  
2017

**National Priorities: Transdisciplinary Research into Detecting and Controlling Lead in Drinking Water**

[RFA open June 27 to August 15](#)

2016 -  
2019

**National Priorities: Impacts of Water Conservation on Water Quality in Premise Plumbing and Water Distribution Systems**

[Two grants awarded](#)

2016 -  
2021

**National Center for Sustainable Water Infrastructure Modeling Research**

[One grant awarded](#)

2016 -  
2020

**National Priorities: Life Cycle Costs of Water Infrastructure Alternatives**

[Two grants awarded](#)

2014 -  
2017

**National Centers for Innovation in Small Drinking Water Systems**

[Two grants awarded](#)



# Communication and Outreach

## Social Media, Other

- ❖ Webpages: [Internet](#) & [Intranet](#)
- ❖ Survey Monkey (SSWR account)
- ❖ [Facebook](#) & [Twitter](#)
- ❖ Fact Sheets & Brochures
- ❖ Tools & Toolkits
- ❖ Communications Plans
- ❖ Campaigns

## External Webinars, Workshops, and Workgroups

- ❖ [Water Research Webinar Series](#)
- ❖ [ORD/OW Small Systems Monthly Webinar Series and Annual Workshop](#)
- ❖ ORD/States Small Systems Technical Communications Workgroup
- ❖ [EPA Tools and Resources Webinar Series](#)
- ❖ Hands-on labs, training, exhibits, and other workshops
- ❖ Research grant kick-off webinars
- ❖ [Research event calendar](#)

## Internal Workgroups, Webinars, and Meetings

- ❖ SSWR Partner Alliance and Coordination Teams (PACTs)
- ❖ ORD cross-program and metrics workgroups
- ❖ ORD stakeholder outreach workgroup
- ❖ OW regulation/rule/health advisory/outreach workgroups
- ❖ Annual SSWR product delivery webinar to partners
- ❖ Monthly SSWR project updates webinars
- ❖ Chautauquas and monthly OW POC calls
- ❖ Quarterly check-ins with OW Office Directors

## Highlights/Newsletters

- ❖ SSWR weekly Highlights (internal)
- ❖ SSWR Monthly Report to Partners (internal)
- ❖ STICS Monthly Report to Partners (internal)
- ❖ [Science Matters Biweekly](#) (external)
- ❖ Water Research Update Quarterly (external)

