

## 2019 ITRC Project Proposal Template

**Due by July 13, 2018 to Patty Reyes at [preyes@ecos.org](mailto:preyes@ecos.org)  
Proposals longer than 5 pages will not be accepted. Replace descriptions  
in each category with proposal response & refer to [evaluation criteria](#) prior  
to completion.**

### Strategies for Preventing and Managing Harmful Cyanobacteria Blooms

*Please use brief statements or bulleted items to input the requested information.*

#### Proposal Date

7/12/18

#### Proposal Contacts

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#### Proposal Summary

##### Problem Statement:

Freshwater inland lakes and reservoirs are prevalent across the United States and serve important ecological, human and industrial needs. They supply approximately 70% of the nation's drinking water and industrial withdrawals. These waterbodies are frequently vibrant hubs of recreation, tourism, and local identity. These are typically open ecological systems and susceptible to harmful cyanobacteria blooms (HCBs) which are increasing in frequency, intensity, and geographic range. Impacts of HCBs

range from nuisance to catastrophic, with the potential for long-term human and ecosystem health effects. HCBs are complex ecological phenomena that are difficult to predict. Generally, it is known that eutrophication and increased temperatures set the stage for cyanobacteria dominance in freshwater systems. In the long term, reduction of nitrogen and phosphorous loading into receiving waters will result in reduced HCB occurrence, however, this may require decades of implementation before realizing success. A complete management portfolio requires the inclusion of risk management strategies that can be implemented over time scales as short as one bloom season. These strategies can be categorically described as watershed/source water risk management including recreational waters and drinking water treatment process assessment and optimization.

States need information and tools that improve their ability to manage the risks posed by HCBs. Although HCBs may occur naturally, ecosystem alterations from human activities appear to be increasing the frequency of some HCBs. HCBs can have a variety of ecological, economic and human health impacts. The increased frequency, intensity and duration of freshwater HCBs can negatively impact drinking water and recreational waters, potentially risking public health.

#### Technical Knowledge and Regulatory Barriers:

There are two legislative drivers regarding HCBs: (1) The Harmful Algal Bloom Hypoxia Recovery and Control Act of 2014 (Public Law [113-124]) and (2) The Drinking Water Protection Act of 2015 (Public Law [114-45]). These statutes direct EPA to investigate the human health and ecological impacts of freshwater HCBs with a focus on forecasting; monitoring; responding to HCBs in inland lakes, rivers, estuaries, reservoirs; impacts on drinking water sources and challenges associated with and to final drinking water treatment.

Determining effective mitigation strategies for HCBs is a challenge for environmental managers. HCB risks can be mitigated in the watershed and the surface water. Mitigation approaches also vary in scale and scope from investigation of individual technologies to integrated watershed monitoring, modeling, and prediction. The project team will develop and share fact sheets and other resources that will address ways to prevent, predict, mitigate, and treat HCBs in freshwater systems. The proposed Fact Sheets from this effort will facilitate communication and planning, and aid in the selection of appropriate responses to mitigate HCBs and protect humans, domestic animals and wildlife from HCBs.

One of the important uses of the Fact Sheets will be to share best practices and lessons learned regarding options for HCB monitoring and treatment. Globally, there are many new and emerging innovative technologies, treatments and services to support HCB management. States will greatly benefit from having information to help assess their options regarding reliability of a technology or treatment as well as use for a particular application or geographic location.

The team will develop case studies geared to identify best practices in managing HCBs - mitigation, preventative measures, detection and monitoring, and remediation technologies.

The proposed team will fully meet the core ITRC purpose and mission:

- To advance innovative environmental decision making;
- To provide guidance on implementing innovative solutions;
- To help provide nation-wide harmonized approaches to using innovative environmental technologies.

## Summary and Schedule of Deliverables (primary project product(s))

Over the course of its 18-month span, the team will develop:

(1) Three fact sheets:

Prevention of Algal Bloom Development: This factsheet will explore the primary step of HCBs response - preventing the bloom before it emerges. This includes addressing the watershed activities on the land and finding alternatives to common practices that result in nutrient transport to surface waters. It will also include an overview of monitoring sensors able to evaluate cyanobacteria abundance and detect bloom events.

HCBs Best Management Practices: This fact sheet will investigate controls and responses that can mitigate a bloom once it forms. This will be accomplished through a series of case studies.

HCBs Risk Communication: This fact sheet will provide guidance on risk communication strategies to the states. Though focused primarily on the nexus between health and water quality, communications about cyanobacteria blooms have a direct effect on communities where water-based tourism and recreation are vital to the local economy. Included in the fact sheets will be case studies of successful HCBs risk communication and lessons learned.

(2) A web tool to aid managers in identification of potential mediation approaches. The tool will ask the user a series of questions regarding an individual body of water, the extent and frequency of HCBs, and ultimately identify relevant remediation strategies. The web tool can potentially be converted to an app as well.

(3) HCBs educational videos for state and local stakeholders and the preventative measures they can take as well as remediation strategies and approaches.

The target users of these deliverables include: state regulators, lake, beach, and marina managers (private, municipal, state); health department operators, reservoir monitors, and drinking utilities.

## Proposed Team Composition

### States:

All 50 states have been greatly affected by HCBs. The following states have experience with HCBs management and are being directly solicited to participate:

California, Florida, Missouri, Ohio, Utah, North Carolina, Vermont, Oregon, Indiana.

### Industry:

The following IAP members with known interest include:

Water Research Foundation

A&E firms conducting remediation

Water sensor technology vendors

Academia:

The following academic institutions will be solicited for support:

University of Michigan

University of Vermont

University of New Hampshire

Ohio State University

Dartmouth College

Government Agencies:

The following government agencies will be solicited for team participation:

EPA/ORD

CDC - Tox group

Department of Agriculture - Natural Resources Conservation Service

NOAA - National Centers for Coastal Ocean Science

**Identification of Potential Funding Sources**

The team has compiled potential funders as follows:

Water Research Foundation - already indicated interest

EPA/ORD

USACE

USGS