

USACE HAB RESEARCH INITIATIVE OVERVIEW

Funding Opportunities and Funded Project Examples

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U.S. Army ERDC Environmental Laboratory



U.S. ARMY



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ENGINEER RESEARCH & DEVELOPMENT CENTER

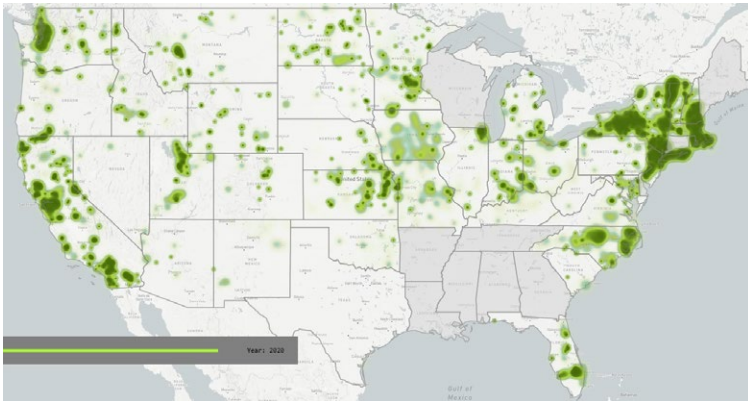
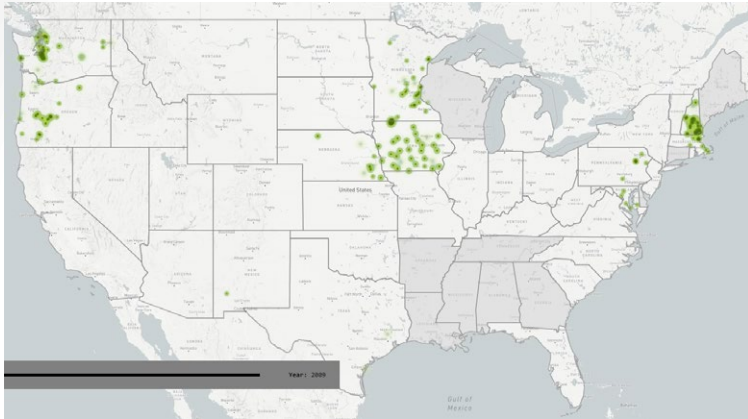




Harmful Algal Blooms (HABs)



A growing threat to our Nation's freshwater resources, USACE Freshwater Assets and Civil Works mission execution



HAB data by state, compiled by [Natural Resources Defense Council](https://www.nrdc.org/)



USACE Districts reporting HAB events (green)

USACE Freshwater Assets: By the Numbers

Recreation & Environmental Stewardship

- 12 MILLION Acres of Land
- 4 Million Acres in Aquatic Systems
- 5,045 Public Recreation Areas
- 4,036 Within 50 miles of Large U.S. Cities
- Hosting 33% of ALL Freshwater Lake Fishing in the Nation
- Hosting 20% of Public Visitation to Federal Lands

Waterways for Cargo & Water Supply

- Maintenance and Operation of 12,000 Miles of Inland and Intra-coastal waterways at 191 Lock Sites. Which...
- Transport more than 600 MILLION Tons of Cargo Annually, AND Management of 7.9 Million Acre-Feet of Municipal and Industrial Water Supply

Flood Risk Management

- 12,000 Dams
- 4,100 Miles of Levees

Hydropower Generation

- 356 Hydropower Generation Units, producing more than 75 Million MWh of Hydropower EACH year



USACE Freshwater HAB R&D Initiative

Authorizations Appropriations & Allocations



- **2018 Water Resources Development Act (WRDA) included U.S. Army ERDC Directive**
 - Deliver a HAB prevention, detection and management technology demonstration program
 - Required scalable technologies applicable to freshwater ecosystems across Nation
 - Funded 36 HAB R&D projects since funds were initially appropriated in Fiscal Year 2019 (FY19) – see [website](#) for factsheets
- **2020 WRDA Sec 128**
 - Directed continued HAB research
 - Authorized new HAB Technology Demonstration Program to support field pilots to generate technology cost and performance data in support technology transfer



USACE Freshwater Harmful Algal Bloom Research and Development Initiatives

Delivering scalable technologies to reduce the frequency and effects of Harmful Algal Blooms (HABs) to our Nation's water resources through research, technology development and demonstration

<https://ansrp.el.ercd.dren.mil/HAB.html>



USACE Implementation Guidance for WRDA 2020 Sec 128-authorized HAB Technology Demo Program

Demonstrating innovative and scalable HAB prevention, detection and management technologies applicable to freshwaters in Ohio and across the Nation





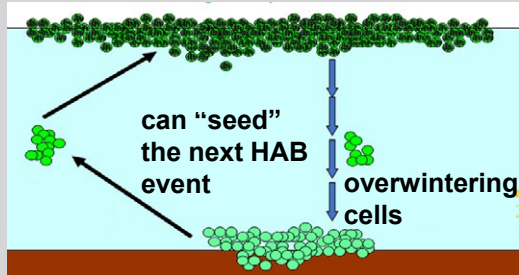
USACE Freshwater HAB R&D Initiative

Overview of USACE-funded HAB projects by research focus area



HAB Research Focus Area: **Prevention**

Reduce biomass and toxicity AND/OR demonstrate reduction in available nutrients feeding the bloom within an aquatic system



Treating cyanobacteria in sediment

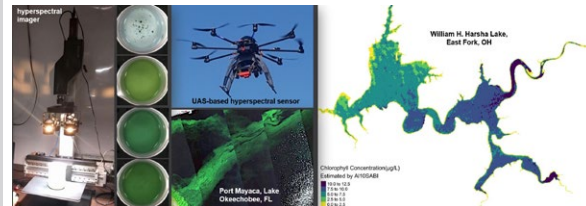


Low-energy ultrasound
photo provided by Dr. Linda Weavers,
The Ohio State University

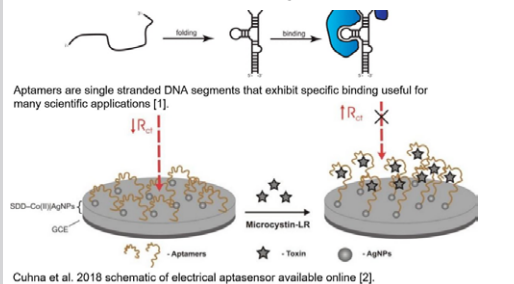
HAB Research Focus Area: **Detection**

Develop rapid, reliable and cost-effective technologies and standardized approaches for improved HAB monitoring and detection.

UAS-based hyperspectral sensor (left);
satellite-based cyanoHAB detection in small
inland waters (right)



DNA Aptamer-Based Cyanotoxin Sensor



HAB Research Focus Area: **Management**

Remove or inactivate HAB biomass and toxins through physical, chemical, and/or biological processes



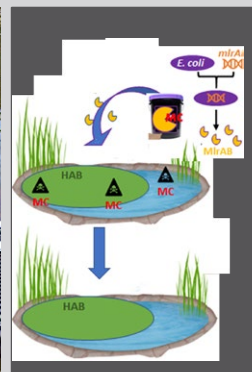
Ultraviolet light¹



Novel oxidant materials



Innovative algaeicide and applications



Bioremediation



Flocculation^[3]



Floatation Manipulation^[4]

HABITATS: HAB Interception, Transformation and Treatment System

2020 USACE Innovation of the Year Award Winner

HABITATS permanently removes HAB biomass and associated nutrients, is applicable to freshwater bodies across our Nation, and is scalable can treat millions of gallons of water/day – producing clean water and biofuel.



1. <https://www.jneurosci.org/content/37/10/2517>; 2. https://www.researchgate.net/profile/Isabel_Cunha4/publication/326519771_Aptamer-Based_Biosensors_to_Detect_Aquatic_Phycotoxins_and_Cyanotoxins/links/5c4640cb458515a4c73766d9/Aptamer-Based-Biosensors-to-Detect-Aquatic-Phycotoxins-and-Cyanotoxins.pdf?origin=publication_detail; 3. <https://repository.tudelft.nl/islandora/object/uuid:b0b6e05d-49d8-4cc0-9e28-f510b0a8b215/datastream/OBJ/download>; 4. <https://ecos.csiro.au/cyanobacteria-responsible-for-january-fish-kill/>

USACE Harmful Algal Bloom R&D Initiative Through the Years



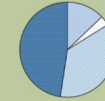
FY19 \$2.3M

- First Funding appropriated under ANCRP
- Partnership formed with **Nova Southeastern** and **USGS** with focus on **Lake Okeechobee**
- 6** HAB R&D projects initiated: *HABITATS, Peroxide Algaecide Study in Lake O, HAB Remote-Sensing Project, HAB Operational Dashboard*



FY21 \$9M

- 1st USACE HAB Listening Session
- 1st Freshwater Interagency HAB R&D Workshop
- Hosted Riverine HABs Workshop with **Marshall U.**
- Western Lake Erie Basin Partnership** webinar series
- 12** new projects; includes **U. of Florida, Ohio State U., Texas A&M U., & U. of Toledo** partnerships



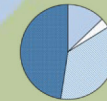
FY23 \$12.8M

- HABITATS received the 2023 Federal Laboratory Consortium Impact Award for Tech Transfer
- Initiate Interagency Cyanobacteria Assessment Network (CyAN) Collaboration
- 3rd USACE HAB Listening Session and Freshwater Interagency HAB R&D Workshop



FY20 \$10M

- Accelerated stakeholder engagements with congressional interest state and federal partners
- 14** new projects; including partnership with **Bowling Green State University**
- “Waterquality: An Open-Source R-package for the Detection and Quantification of Cyanobacterial Harmful Algal Blooms and Water Quality” (*Johansen et al. 2019*) most visited/downloaded technical report



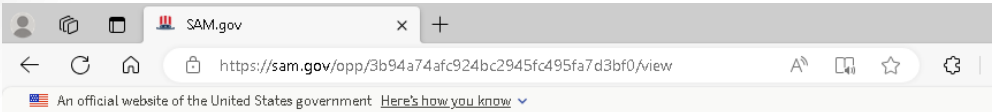
FY22 \$10.5M

- First funding for **HAB Demo Program** (\$4M not in total above)
- Remote Sensing for Inland Waterbodies* selected **Technology Spotlight for Chief of Engineers, Commanding General Spellmon’s R&D Monthly Update**
- 2nd USACE HAB Listening Session and Freshwater Interagency HAB R&D Workshop
- 4** new projects; includes new partnerships with **U. of S. Florida, Ohio State. U., Marshall U., U. of Toledo.**

Legend

- University
- ERDC
- Industry
- Federal

ANCRP – Aquatic Nuisance Control Research Program; FLC – Federal Laboratory Consortium; HAB – Harmful Algal Bloom; HABITATS – HAB Interception, Treatment and Transformation System; Lake O – Lake Okeechobee; R&D – Research & Development



Home Search Data Bank Data Services Help



US Army Corps of Engineers

2023 ERDC Broad Agency Announcement

Contract Opportunity

- General Information
- Classification
- Description
- Attachments/Links
- Contact Information
- History
- Award Notices

ACTIVE

Notice ID
W912HZ-23-BAA-01

Related Notice

Department/Ind. Agency
DEPT OF DEFENSE
Sub-tier
DEPT OF THE ARMY
Major Command
USACE
Sub Command

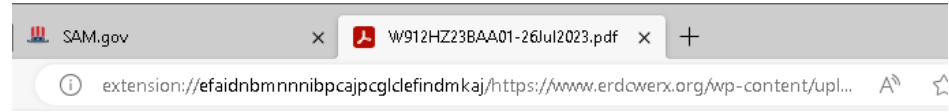
Contract Opportunity



Attachments/Links

Links

Display Name	Updated Date
ERDC Broad Agency Announcement	Mar 31, 2023



W912HZ23...Jul2023

W912HZ-23-BAA-01

ERDC Broad Agency Announcement

March 2023



US Army Corps of Engineers



BROAD AGENCY ANNOUNCEMENT

W912HZ-23-BAA-01

U.S. ARMY CORPS OF ENGINEERS (USACE)
ENGINEER RESEARCH AND
DEVELOPMENT CENTER (ERDC)

B. Aquatic Nuisance Species (EL-36)

- Harmful Algal Blooms (HABs), which can be caused in freshwater by various cyanobacteria, represent a significant and costly threat to our Nation's economy and natural resources. Research proposals submitted under this topic area (EL-35-1) should examine methods, develop and/or demonstrate innovative technologies for HAB detection, prevention and management intended to reduce the frequency and effects of HABs on our Nation's freshwater resources. Proposed methods and technologies must be scalable to meet the need of very large freshwater HAB events. Explicitly addressing the scalability requirement in proposals is strongly encouraged. Note that water quality, including impacts to drinking water, is not an explicit USACE mission. Proposals that focus exclusively on water quality may be limitedly considered. Proposals that use UAS as a monitoring or surveying method will not be considered.





Award Types



Contracts

- Principal purpose is to acquire R&D for the direct benefit or use of the awarding agency

Cooperative Agreements

- Support or stimulation for a public purpose
- Substantial involvement expected between agency and recipient

Grants

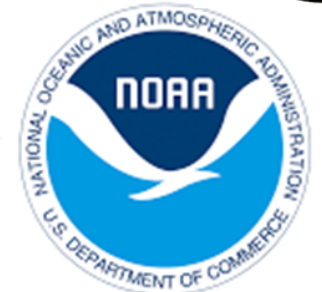
- Support or stimulation for a public purpose
- Substantial involvement is *not* expected between agency and recipient

Contracts	Cooperative Agreements
Acquire goods or services for the direct benefit of the Government	Provide assistance to support a public purpose whose primary beneficiary is the public
Collaboration and/or Government involvement is not allowed	Substantial Government involvement is required
Results are not required to be disseminated to the public	Results are required to be disseminated to the public
Deliverables include software and prototypes	Deliverables include data and reports
Allow for profit/fee	Profit/fee is not allowed
Are subject to Prompt Payment Act meaning they can incur interest penalties	Are not subject to Prompt Payment Act and therefore don't incur interest penalties



THANK YOU!

Department of Environmental Conservation



CONNECT WITH US

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Thank you!

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Aquatic Nuisance Species
Research Program

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AQUATIC PLANT CONTROL
RESEARCH PROGRAM
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USACE Freshwater Harmful Algal Bloom
Research and Development Initiatives

Delivering scalable technologies to reduce the frequency and effects of
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research, technology development and demonstration

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