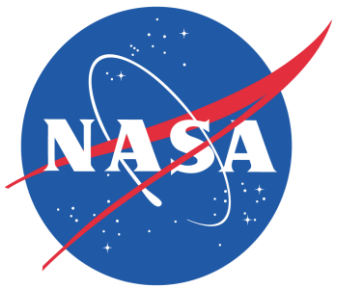
CyAN (Cyanobacteria Assessment Network) Project

Work Package 1: Field Data Collation/Interpretation

Keith Loftin, USGS



CyAN Project- Agency PI's

- Blake Schaeffer – EPA
- Keith Loftin - USGS
- Richard Stumpf – NOAA
- Jeremy Werdell – NASA

Technical Approach

Remote Sensing

Uniform and systematic approach for identifying cyanobacteria blooms.
Strategy for evaluation and refinement of algorithms across platforms.

Environment

Identify landscape linkages causes of chlorophyll-a and cyanobacteria.

Health

Exposure and human health effects in drinking and recreational waters.

Economics

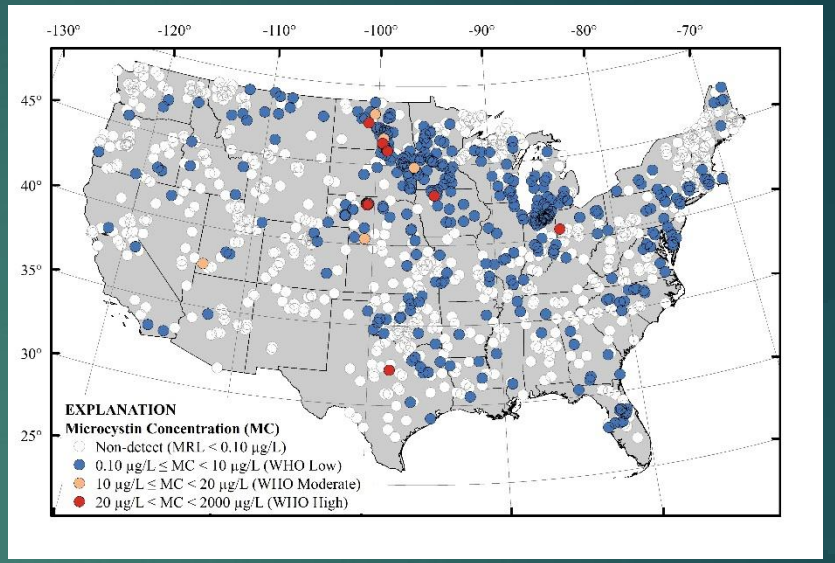
Behavioral responses and economic value of the early warning system.

Notifications

Bring the technology to EPA, states and tribal partners.

Work Package 1: Team Introduction

Robyn Conmy, US EPA



Jenny Lanning-Rush, USGS

Jennifer Graham, USGS

Keith Loftin, USGS, OGRL

Work Package 1: Goals

- Develop a rational basis for inclusion/exclusion of field data using a tiered data quality approach for algorithm validation/calibration.
- Develop a rational converging lines of evidence approach within field measurements and versus remote sensing measurements.
- Reconciliation of methods differences through the use of human and/or ecological health thresholds (e.g. WHO recreational guidance)
- Publish reports/journal articles as appropriate:
  - Documentation on database for public release towards end of project
    - Include discussion on rational schemes for data QC and threshold
  - Evaluation of national cyanoHAB pictures

Timelines

	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Develop sampling wish list for collaborators	x				
Develop plan for requesting, managing and QA/QC field observation data from states, tribes, municipalities, and federal sources	x				
Request field observation data	x	x	x		
Create database for satellite product validation		x	x	x	
Publications				x	x

Target Data Criteria

- Natural and manmade lakes/ponds, Coastal data (will be covered by EPA)
- Temporal/spatial datasets within same waterbody
- Low, medium, and high concentrations for each variable needed:
  - Turbidity
  - Phytoplankton
  - Cyanotoxins
  - Pigments
  - Nutrients

Highly Desired Data Sets

- **Phytoplankton (cyanobacteria)**
  - Abundance
  - Relative Abundance
  - Biovolume
- **Pigments**
  - Chlorophyll including pheophytin data
  - Phycocyanin
- **Cyanotoxins**

Sample Location Data

- **Date/Time** -
- **Latitude/Longitude** – Continental United States
- **Sampling Depth** – Prefer surface samples – integrated photic zone or shallower.
- **Sample Type** (Grab, Composite, Depth Integrated, Width Integrated, Depth-Width Integrated)

General Water Quality

- **pH** - QC for phytoplankton abundance and bloom status (e.g. elevated pH during daylight (9.5 – 11) = very active bloom.
- **Dissolved Oxygen (DO)** – QC for phytoplankton abundance and bloom status (e.g. supersaturated DO during daylight = very active bloom, anoxic/anaerobic bloom possible bloom undergoing senescence.
- **Conductivity**
- **Surface Water Temperature**
- **Organic Matter** -Support development of derived turbidity product and QC for phytoplankton data.
  - Total Organic Carbon (TOC)
  - Dissolved Organic Carbon (DOC)

General Water Quality

- **Nutrients** – Support development of derived eutrophication/chlorophyll product.
  - Total Nitrogen (TN)
  - Total Phosphorus (TP)
  - Speciated Nutrients
- **Particulates** – Support development of derived turbidity product.
  - Secchi Depth
  - Turbidity
  - Suspended Solids

Spectrometry and Other Surrogate Measures

- **Digital Field Pictures** – Does field observation support data (QC), capture other interferences not captured by other field data measures (e.g. aquatic plant cover, etc.)
- **Water Color** (not as crucial if above data available).

Data Sources

- USGS
- US EPA
- US ACE – no national database, but might be willing to load into WQX.
- US BOR (need to contact)
- US National Parks (have a contact)
- US Fish and Wildlife (need to contact)
- States (Rick – CA, FL, OH); Inland HAB Discussion group, ASDWA, etc.
- Tribes – inland HAB discussion group, states, USGS/US EPA tribal liasons

Other Details

- Supporting (hopefully citeable) sample collection and laboratory methods documents.
- Defined (formal) QA/QC plan.
- Field and Laboratory QA/QC data
  - Blanks
  - Replicates
  - Spiked replicates
  - Calibration
- Any caveats we should know about your data.

Work Package 1: Team Contact Info

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