



Remote Sensing of Cyanobacteria in Lakes: The CyAN Web App and National Modeling

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The views expressed in this presentation are those of the authors and do not necessarily represent the views or policies of the U.S. Environmental Protection Agency
Data and analyses are preliminary and subject to change





Cyanobacterial Assessment Network

Interagency Project

Temporal coverage

- MERIS: 2008-2011
- Sentinel 3A/B: 2016-Present

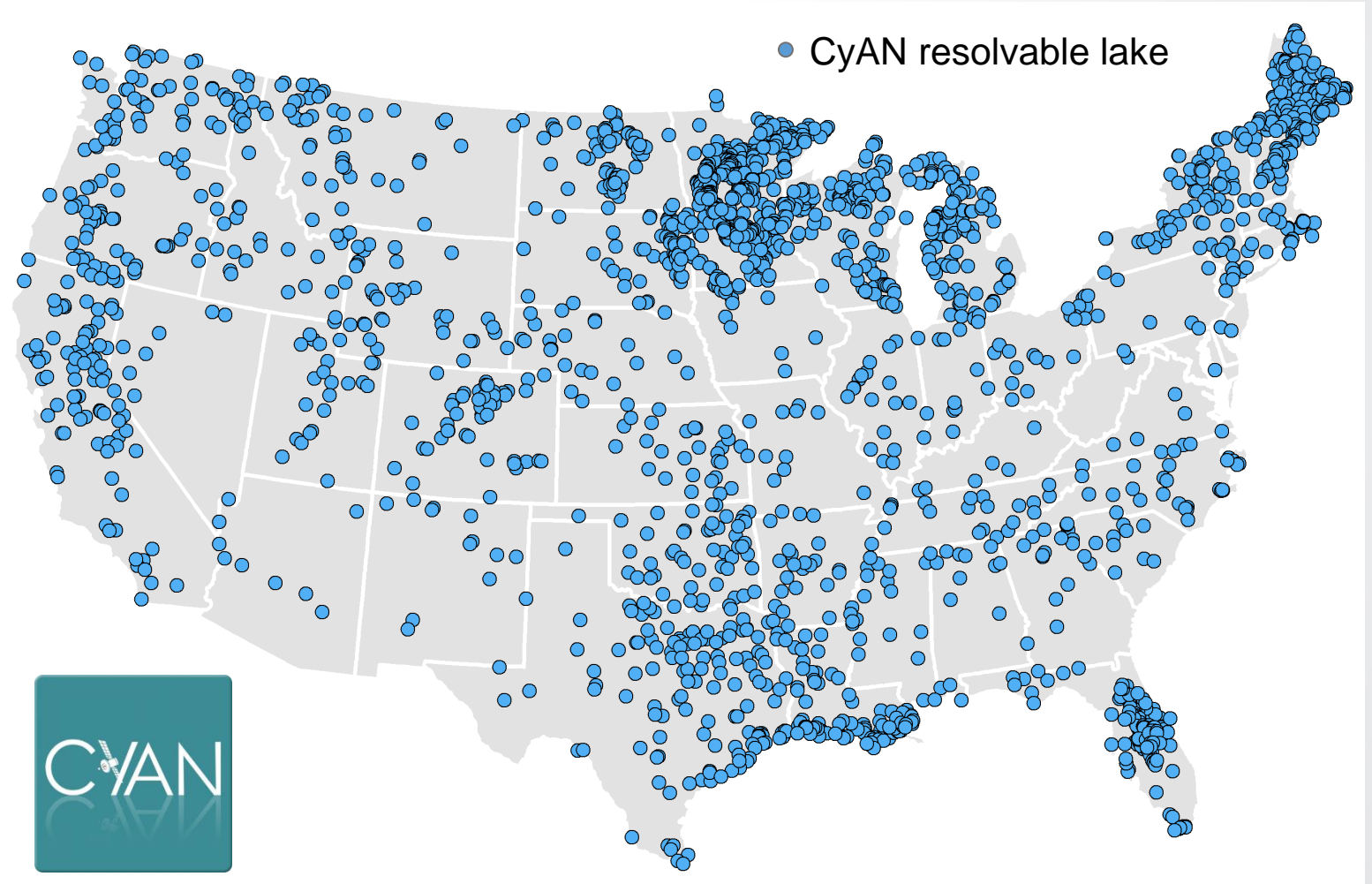
Pixel size: 300 x 300 m

Resolved lakes: ≥ 3 pixels

Number of lakes: ~2,200

Current Android App

Web app in development





Web App - Access Latest CyAN Data

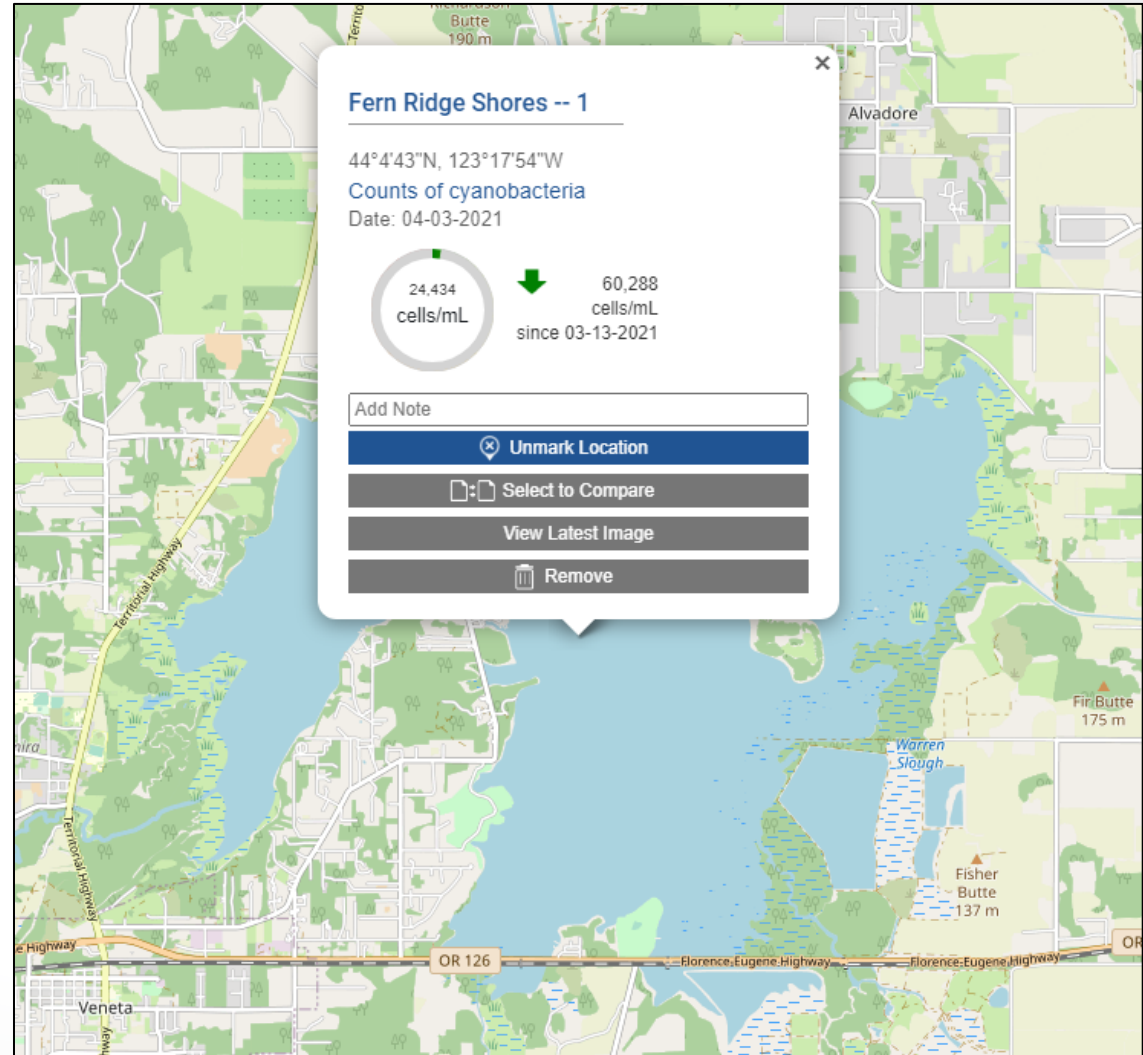
My Locations Compare Notifications

Location Name X

Show checked locations 56 locations

Abert Rim Historical Marker -- 1 42°35'51"N, 120°13'24"W (Max adjacent cells: 554,626)		62,332 cells/mL since 03-27-2021 Date: 04-03-2021
Alkali Lake -- 1 42°58'20"N, 120°1'27"W (Max adjacent cells: 444,631)		239,315 cells/mL since 06-08-2019 Date: 06-15-2019
Aspen Lake -- 1 42°17'6"N, 122°0'29"W (Max adjacent cells: 97,275)		41,508 cells/mL since 03-13-2021 Date: 03-20-2021
Beulah Reservoir -- 1 43°55'39"N, 118°9'23"W (Max adjacent cells: 159,956)		62,002 cells/mL since 10-31-2020 Date: 11-07-2020
Breezy Point -- 1		

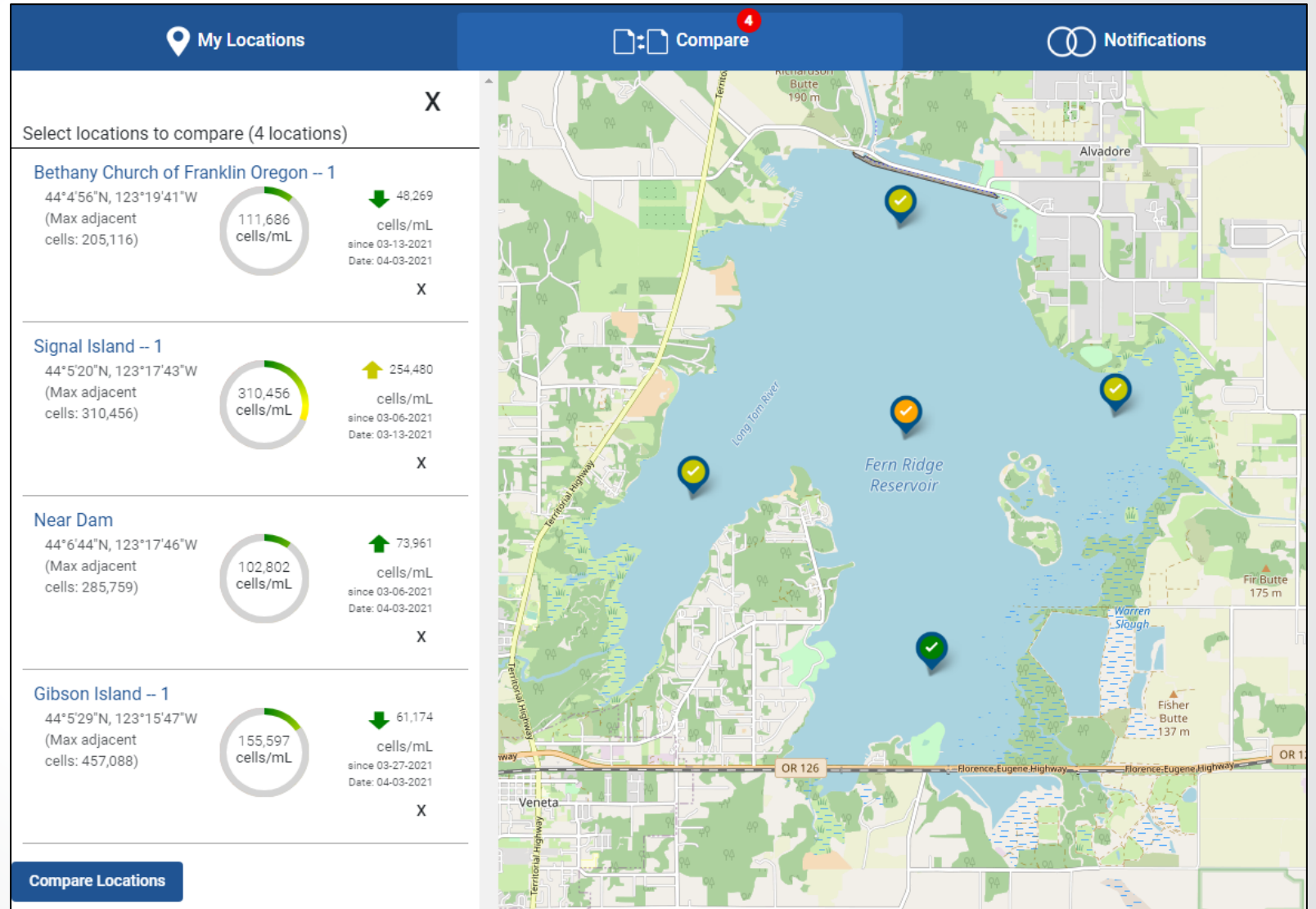
- Add pins to a lake pixel
- Shows most recent value
- Trend relative to prior value
- Information associated with a single pixel





Compare Locations

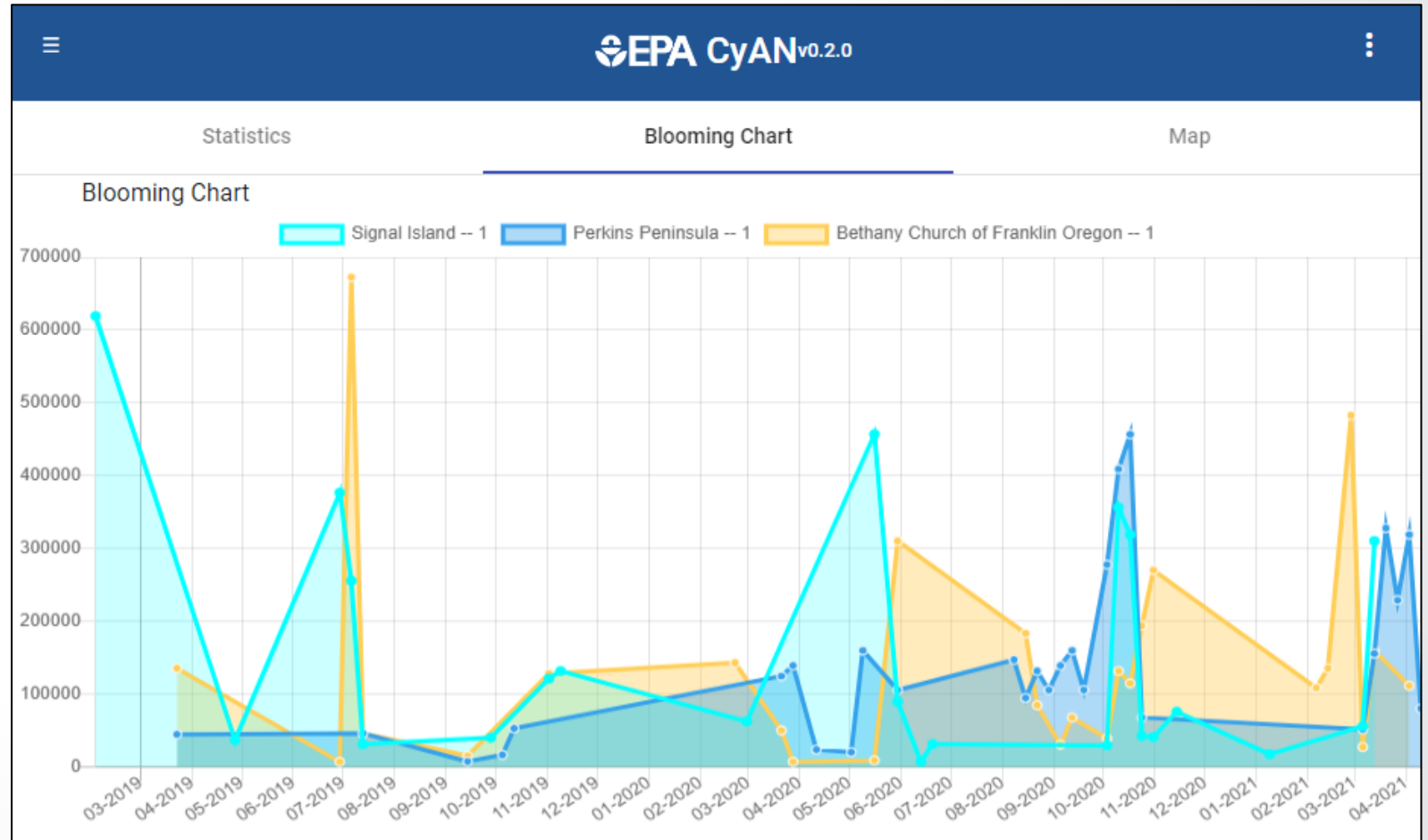
- Locations in same or different waterbody
- Quick integrated view of waterbody data





Compare Locations

- Locations in same or different waterbody
- Quick integrated view of waterbody data
- View time series





Adjust Color Thresholds

Can be adjusted to levels of concern

Custom threshold for an alert

Modify Marker Color Configuration

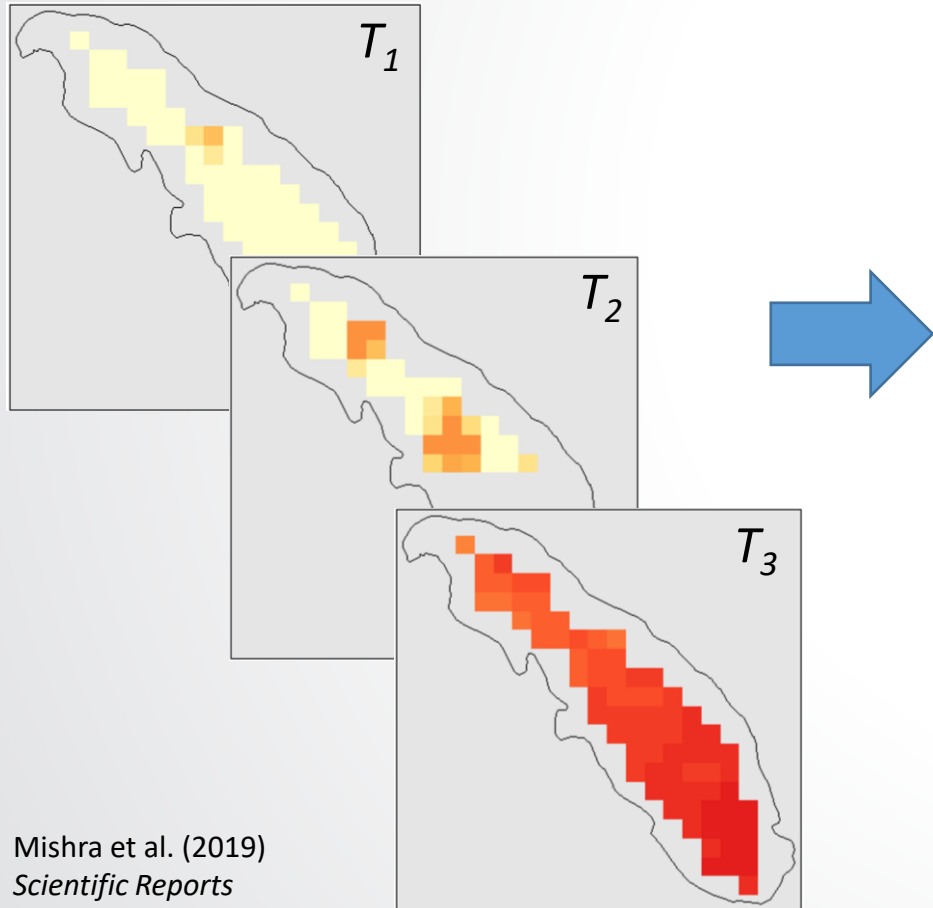
Level	Color	From	To
Low	Green	To 100000	
Medium	Yellow	From 100000	To 300000
High	Orange	From 300000	To 1000000
Very High	Red	Higher than 1000000	
Alert	White square	Alert when higher than 1000000	



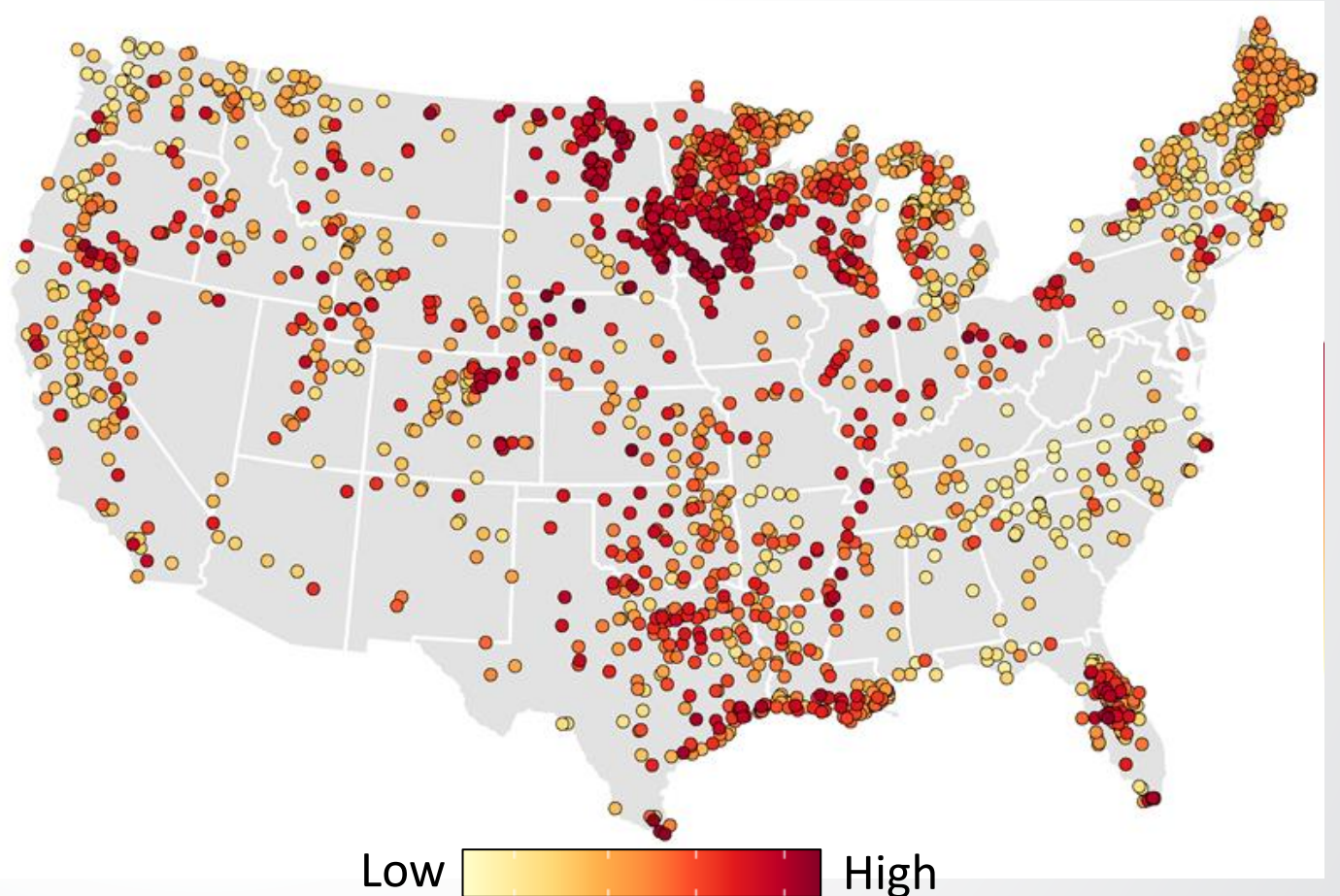
Using CyAN and National Field Surveys to Assess Microcystin Risk

Summarize CyAN Data for Summers

Weekly Imagery



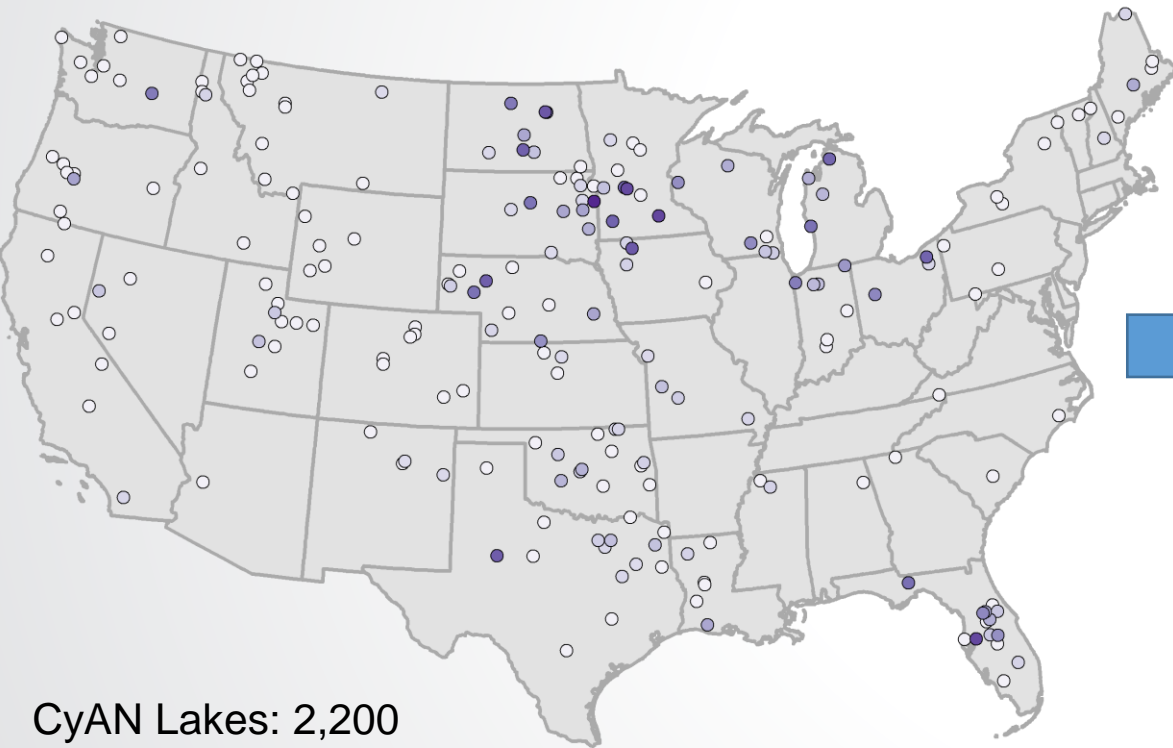
CyAN Summer Bloom Magnitude



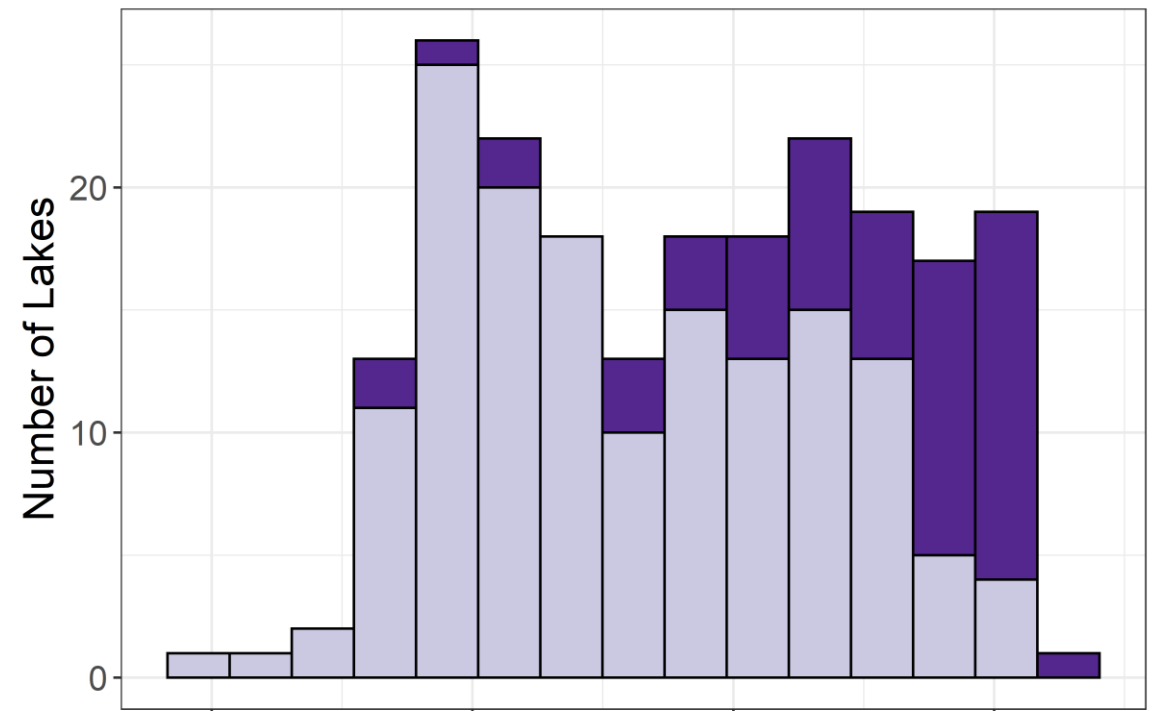


Lakes with Field Microcystin Data

Summer field survey concentration



Categorized based on threshold

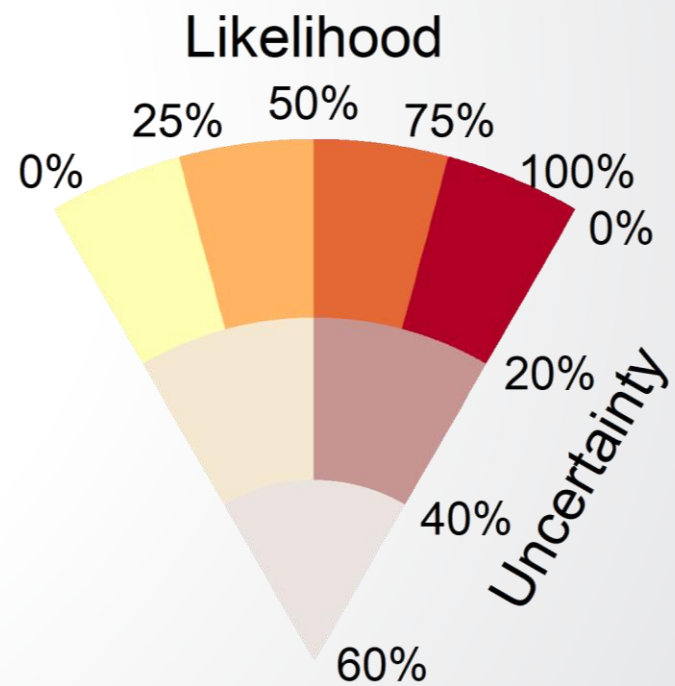
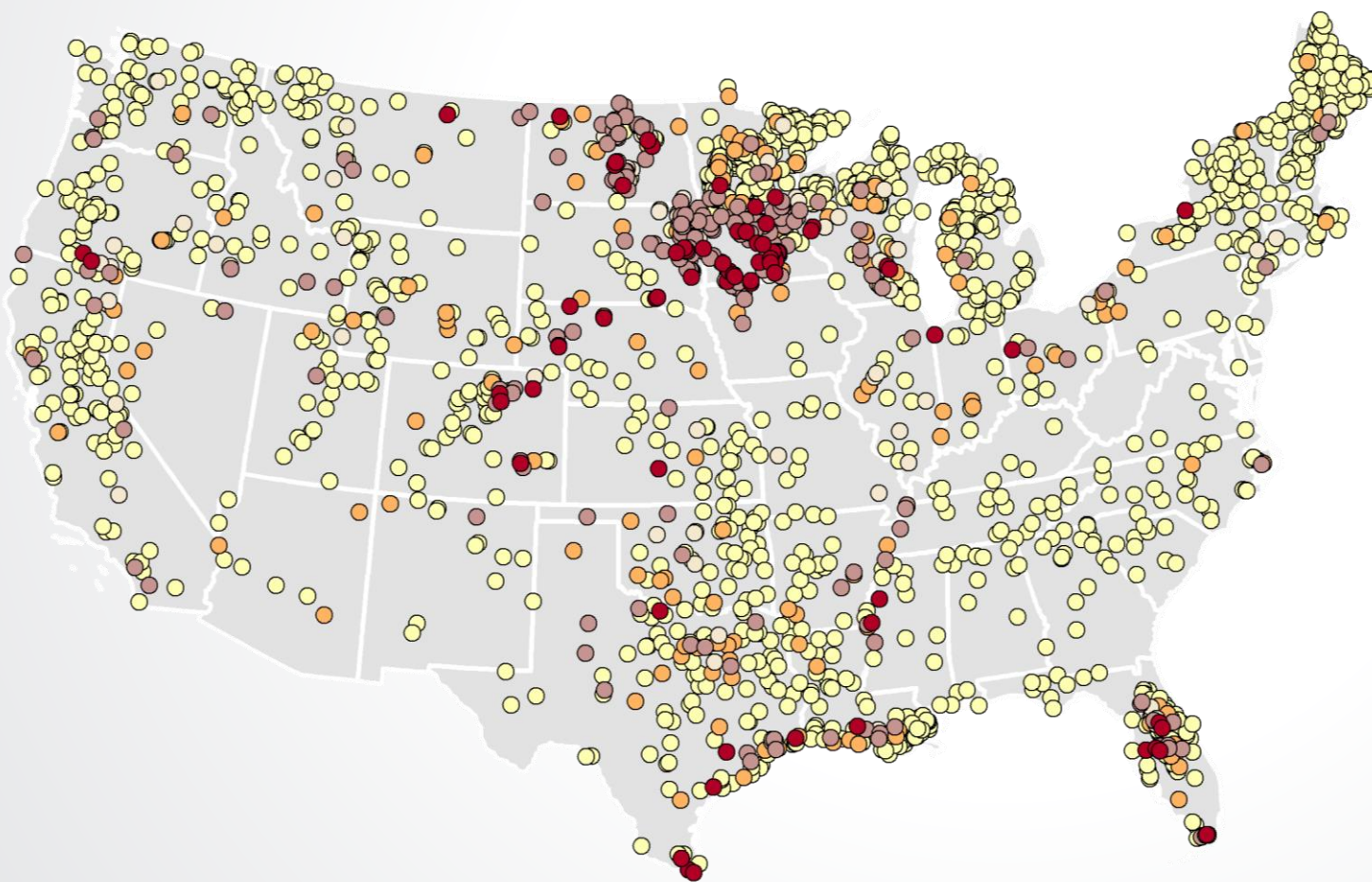


Microcystin 0.2 $\mu\text{g/L}$ Above Below



Likelihood of Threshold Exceedance

Microcystin 0.2 ug/L





Thank you!

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Questions?

CyAN Web App Development
Regional Applied Research Efforts Project
supported by EPA R10, R8, R7, & R4
Comprehensive Monitoring and Analysis
of Dynamics of Harmful Algal Blooms
Regional Applied Research Efforts Project

