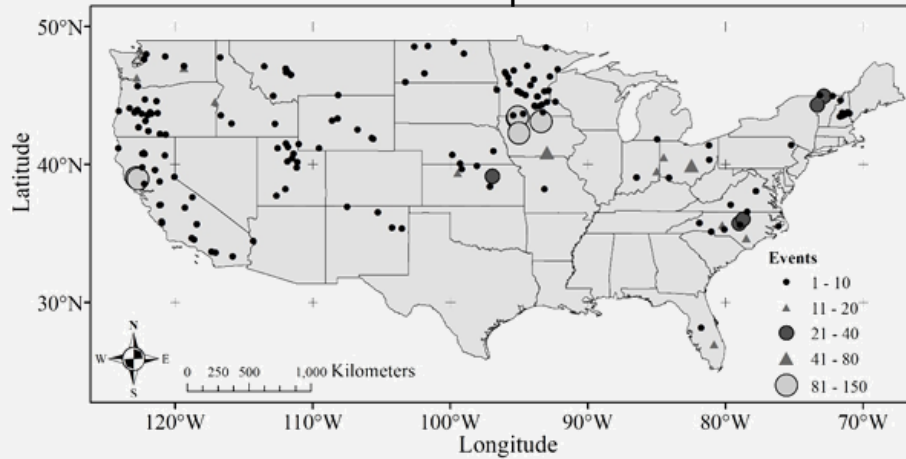# Cyanobacteria Assessment Network – lessons learned
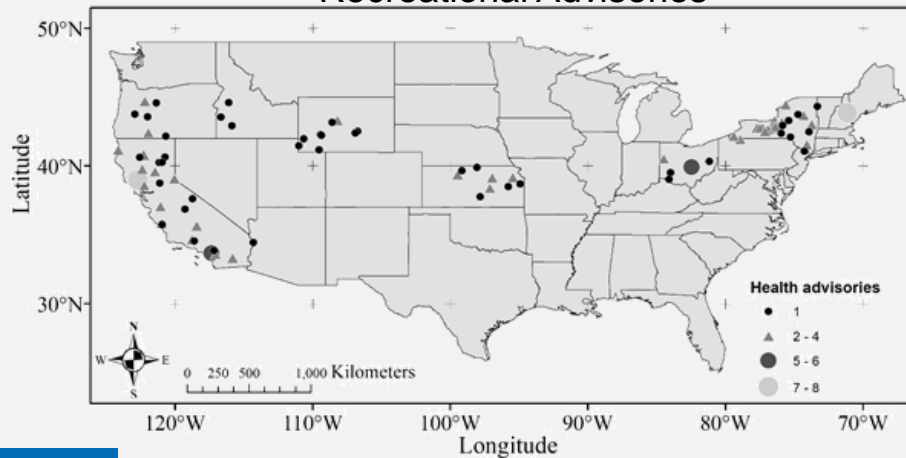
- Problem: Limited resources w/ broad spatial and temporal scales

- Action: Satellite technologies <u>complement</u> traditional field measures

- Result: Earlier response and informed decision making

- Impact: Save money and protecting humans, animals and the environment
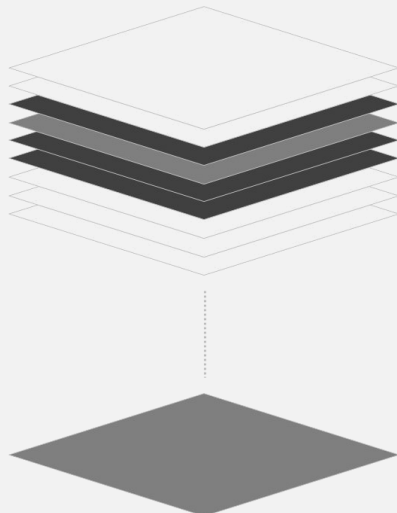
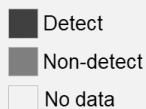Event Responses

Recreational Advisories

Cyanotoxin and cell counts

Mishra et al. Science of Total Environment
Whitman et al. *In Prep.* Natural Disasters
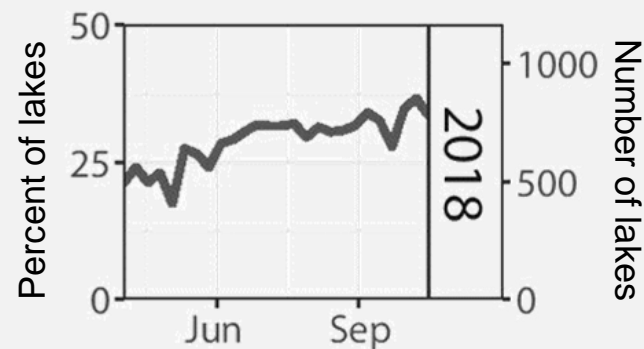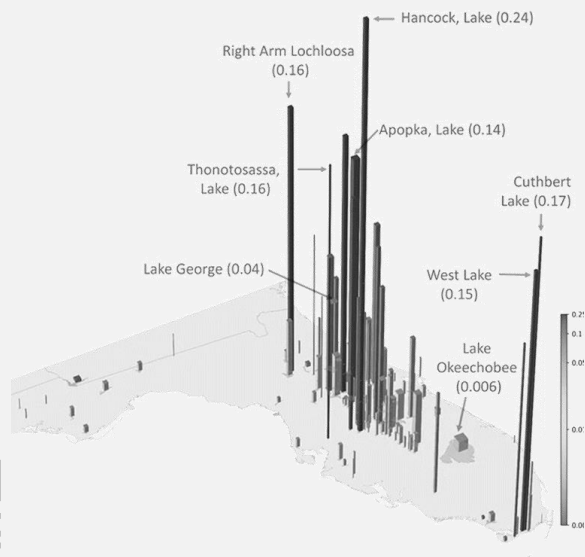Seegers et al. *In Review. Remote Sensing of Environment*

52 weekly composites

Detect
Non-detect
No data

Temporal Frequency

Clark et al. 2017. Ecological Indicators.
Coffer et al. *In Review.* Ecological Indicators.

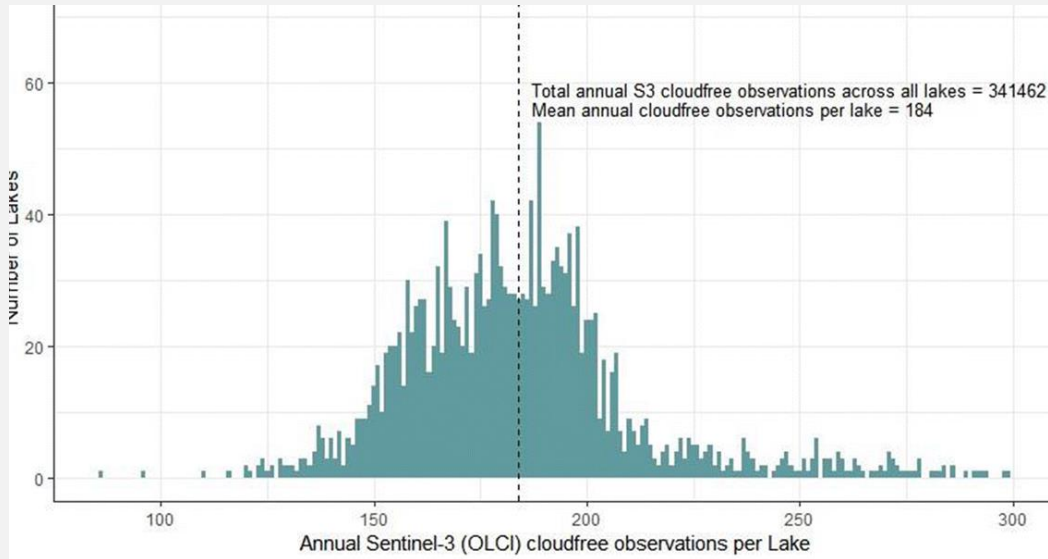## Spatial Extent

Urquhart et al. 2017. Harmful Algae.

Hancock, Lake (0.24)
Right Arm Lochloosa (0.16)
Apopka, Lake (0.14)
Thonotosassa, Lake (0.16)
Cuthbert Lake (0.17)
Lake George (0.04)
West Lake (0.15)
Lake Okeechobee (0.006)

Magnitude

Mishra et al. 2019. Scientific Reports.

Percent of lakes
Number of lakes
2018
Jun   Sep

Occurrence

Coffer et al. 2019. Ecological Indicators.

Potential cost savings

Total annual S3 cloudfree observations across all lakes = 341462
Mean annual cloudfree observations per lake = 184

Annual potential avoided costs associated with satellite chlorophyll-a ~$5.7 million/year

Papenfus et al. Environmental Monitoring & Assessment

Harmful Cyanobacterial Bloom (HCB) Recreational Use Advisories: Big Sandy, Eden, Lower North Crow, Pathfinder, and Woodruff Narrows Reservoirs

The Wyoming Department of Health has issued recreational use advisories…

Potential blooms were identified by satellite imagery from the Cyanobacteria Assessment Network (CyAN) or reported to the Wyoming Department of Environmental Quality.
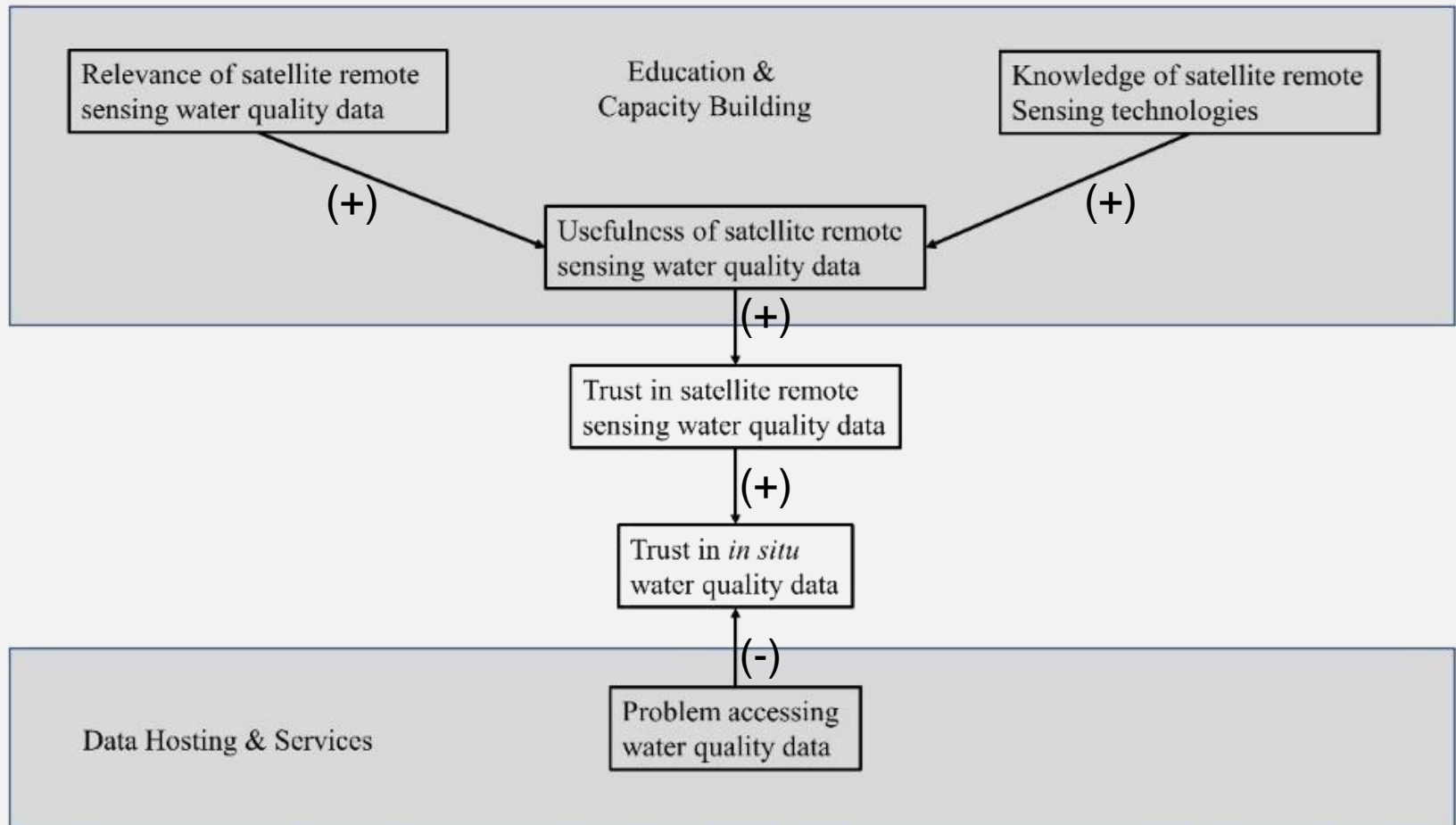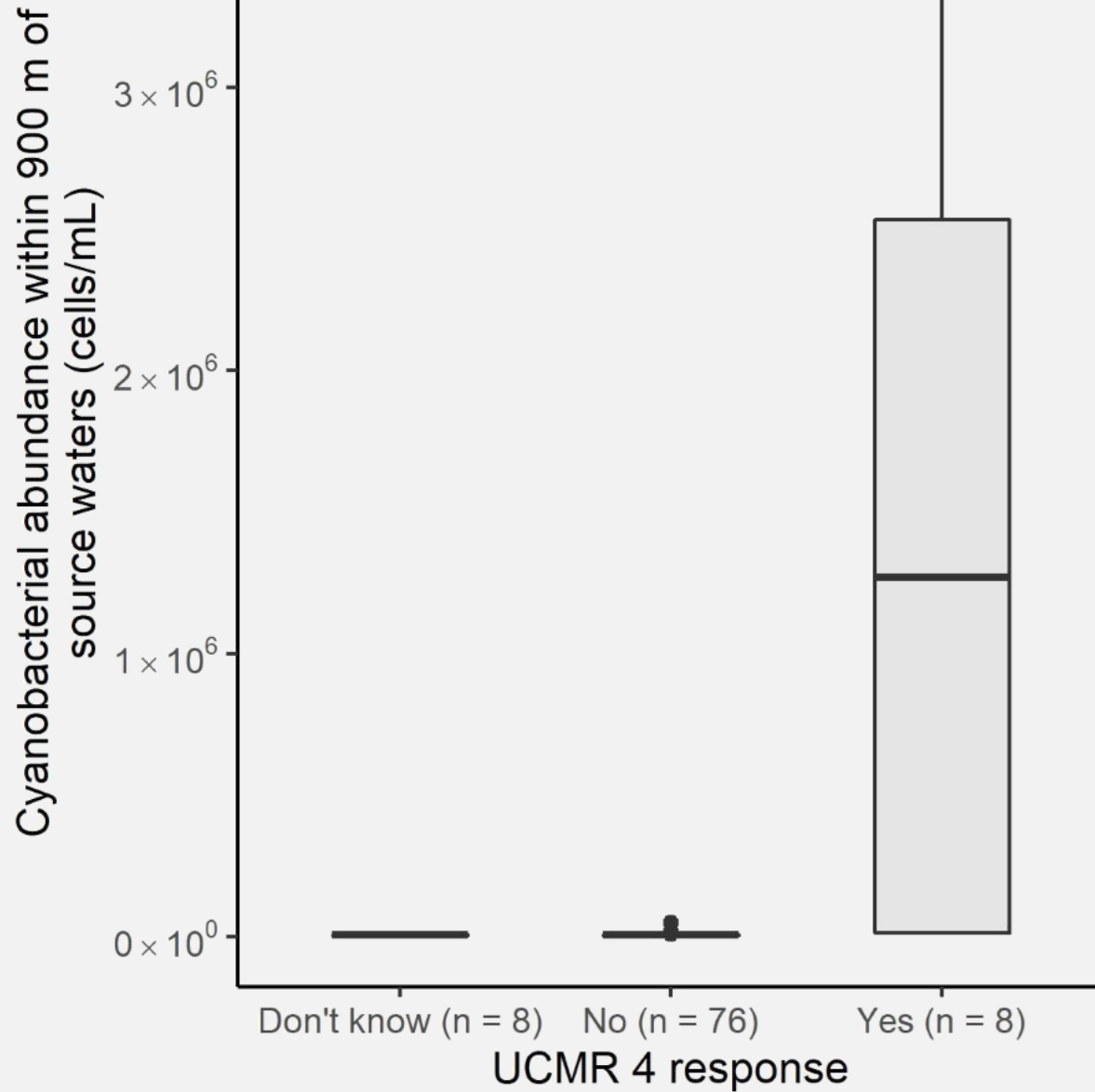
Potential cost savings
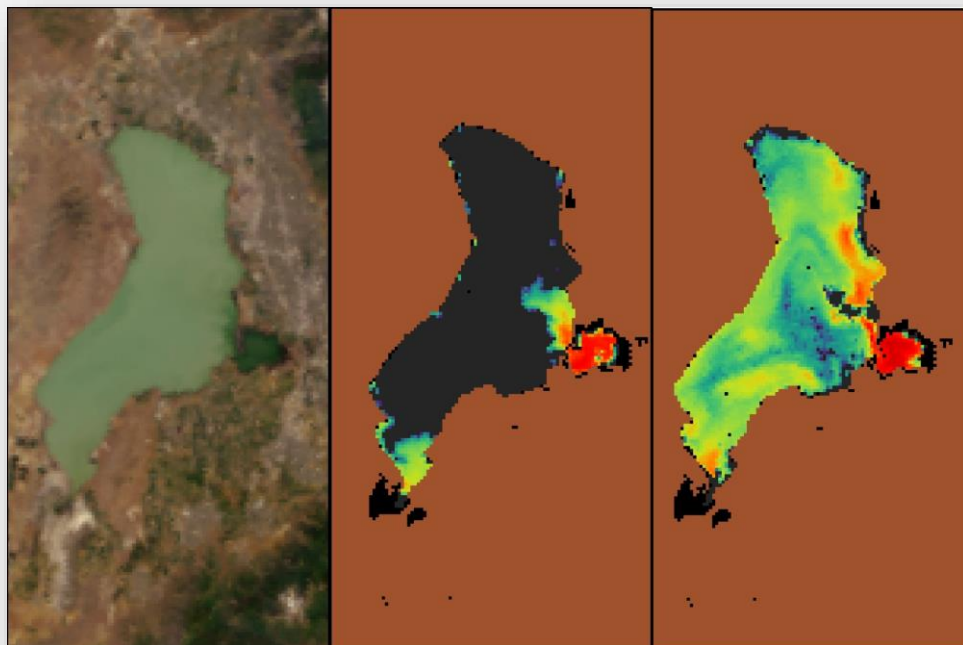
Satellite data yielded
socioeconomic benefits
by improving human
health outcomes valued
at ~$370,000

Stroming et al., *2020.* GeoHealth

Tyler et al., *In Prep.* Research Policy

Coffer et al., *In Review.* Water Research

American Water Works Association M57 Version 2
Ogashawara et al. In Prep
Chpt4: Algae Surveillance and Quantification through Remote Sensing

Monitoring Section
4.3.1.4 Remote Sensing

Welker et al. 2021. Chpt 11: Planning monitoring programmes for cyanobacteria and cyanotoxins.