

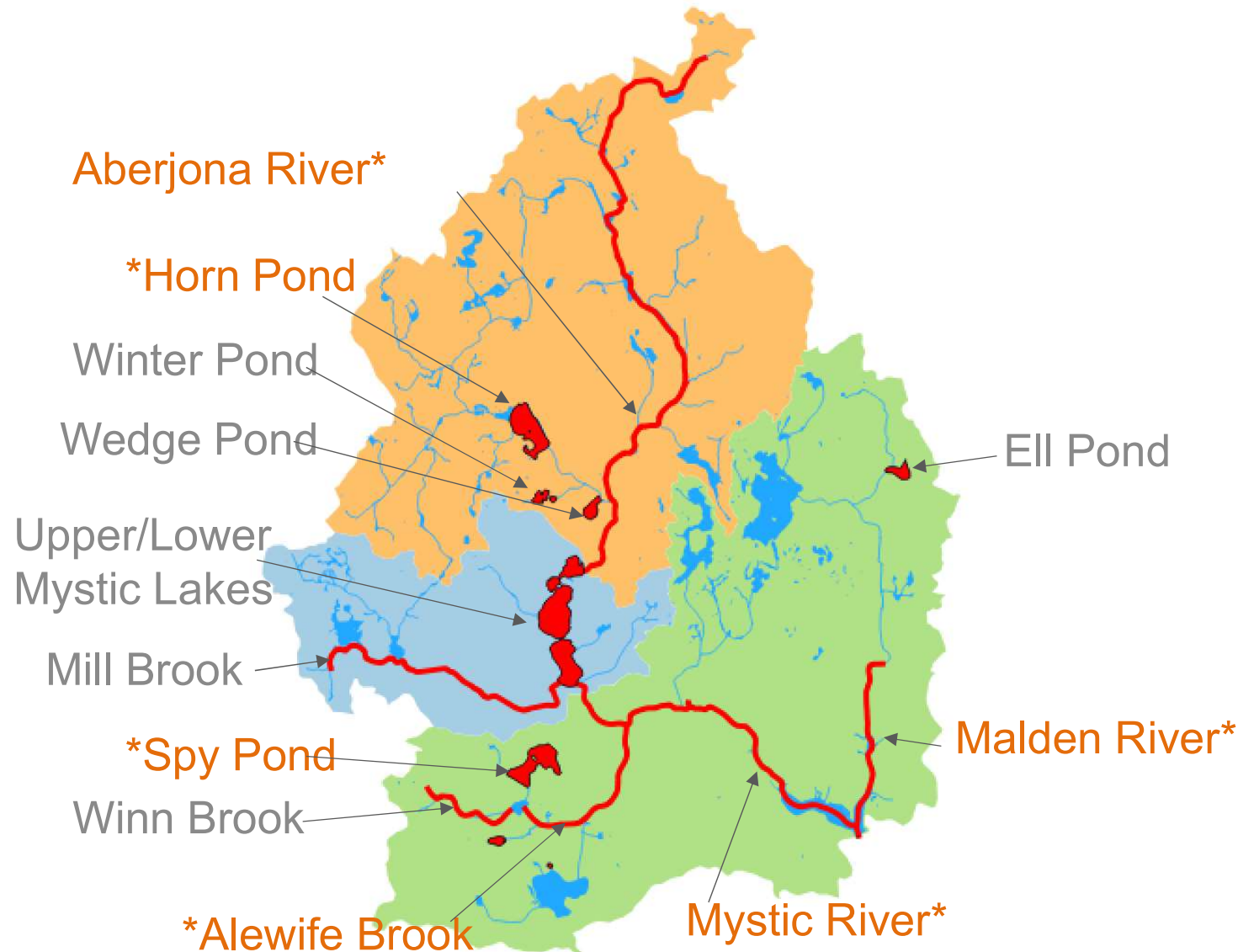
Mystic River Phosphorus Loading Study:

Background, History, and Some Results

*Andy Hrycyna, Mystic River Watershed Association
Mystic River Science Forum
US EPA offices, Boston, MA
May 4, 2017*

303(d)-listed Water Bodies in Watershed

All category 5 impairments (TMDL required) 2014



Nutrients as pollutants

- Phosphorus is limiting nutrient in freshwater
- High in urban areas
- Fosters algal blooms and invasive plants
- Leads to eutrophication: low oxygen, etc.
- Public health implications: cyanobacteria

An aerial photograph showing a residential neighborhood with several houses and a street. A river or canal flows through the area, heavily infested with green lily pads. Several boats are docked along the riverbank, and a parking lot is visible in the bottom right corner. The text "Evidence of impairment: Invasive plants" is overlaid on the image.

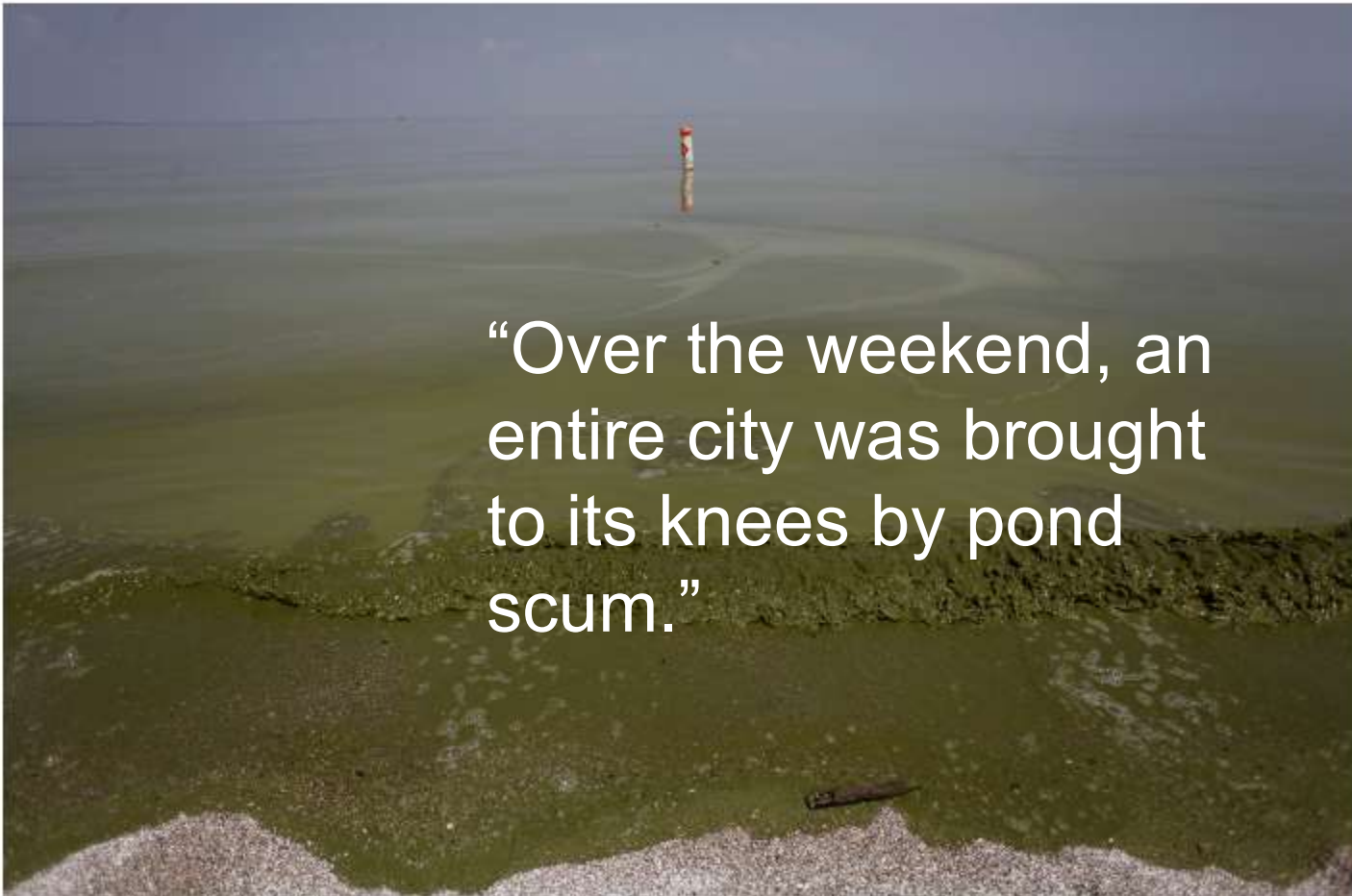
Evidence of impairment:
Invasive plants

Cyanobacteria Are Far From Just Toledo's Problem



Carl Zimmer

MATTER AUG. 7, 2014



“Over the weekend, an entire city was brought to its knees by pond scum.”

The algae-clogged waters of Lake Erie as seen from Maumee Bay State Park near Toledo, Ohio.

Joshua Lott for The New York Times

Mystic River Cyanobacteria Bloom Summer 2016

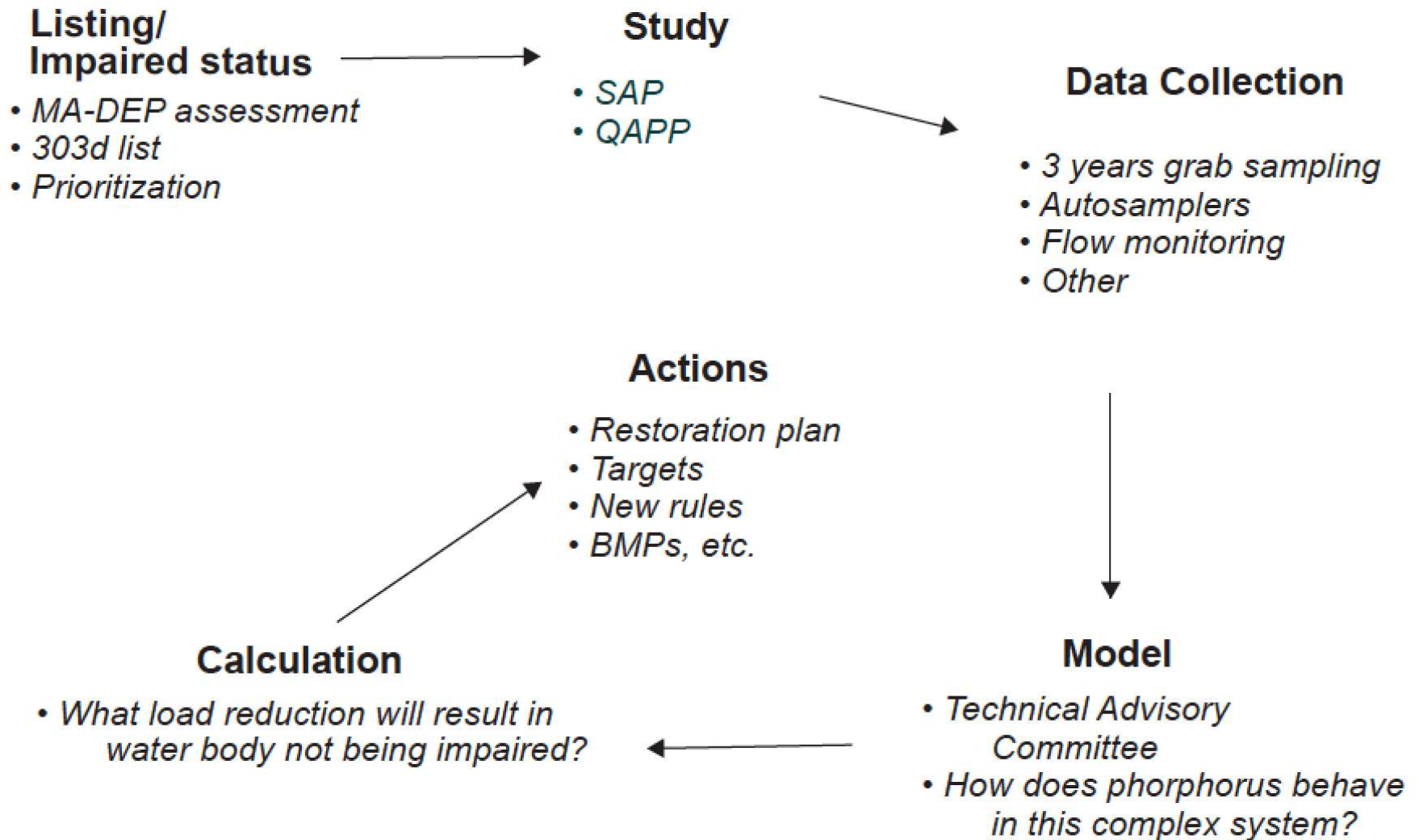


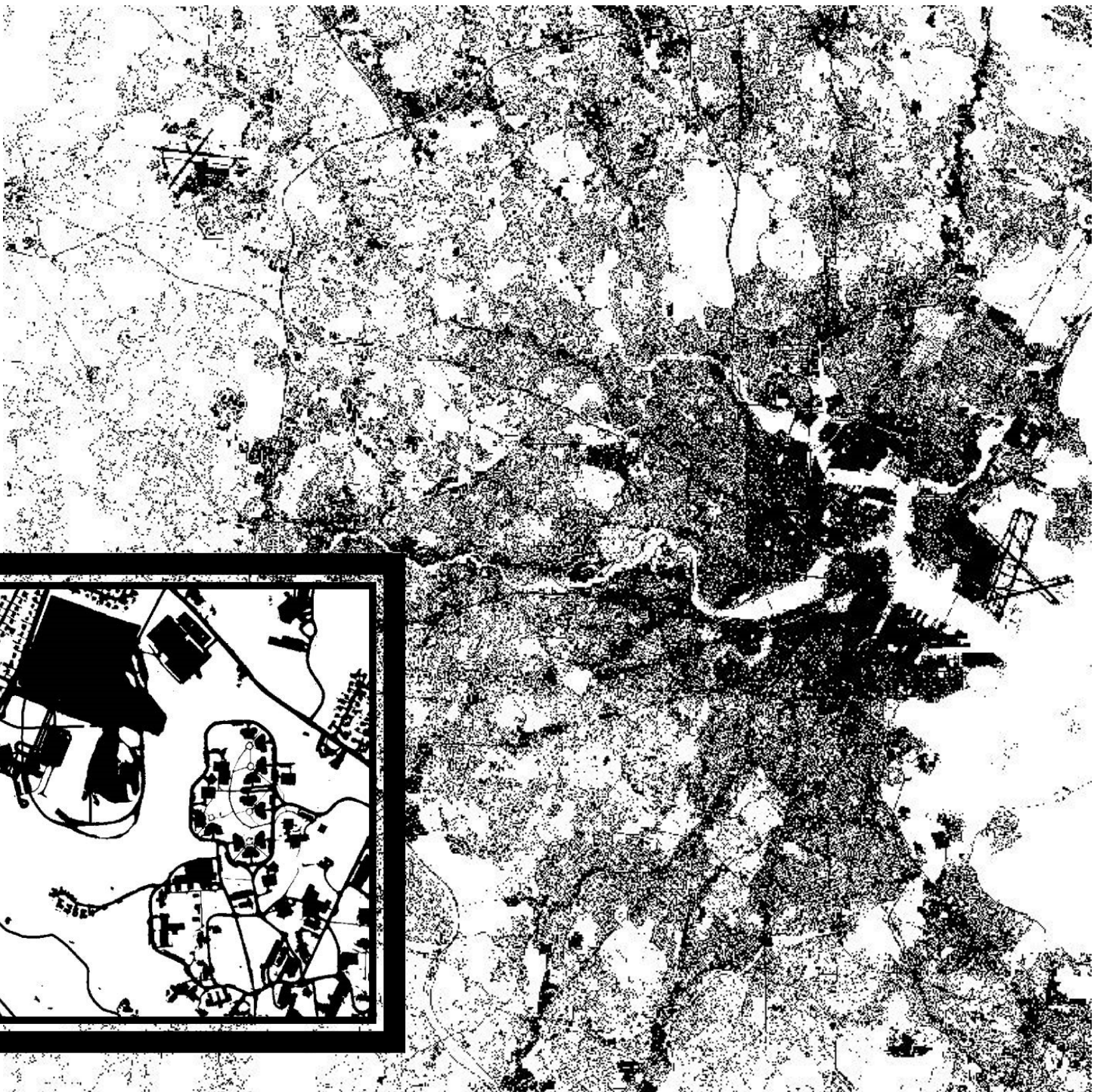
History of project and collaborations

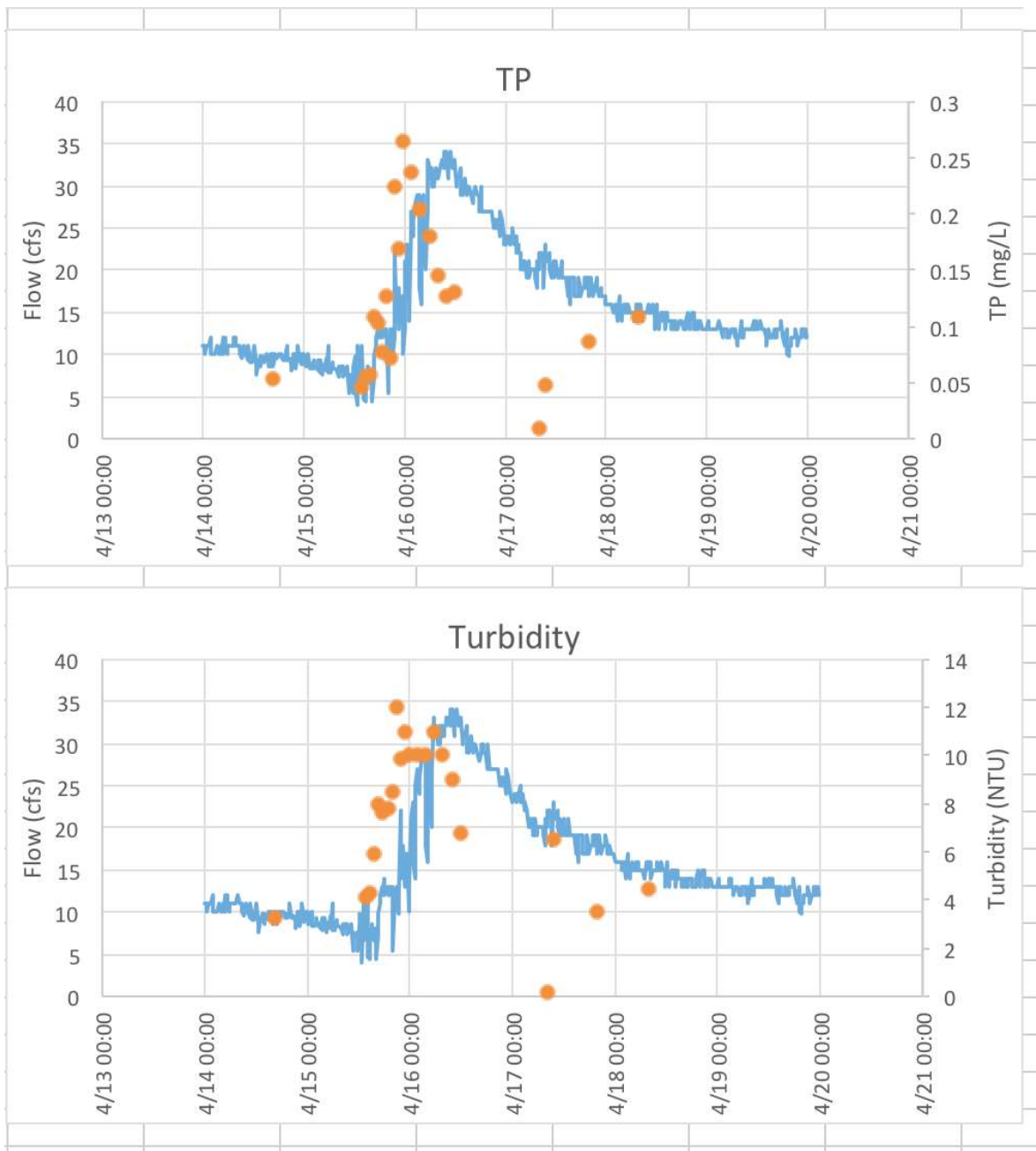
- EPA Region 1 laboratory
- Mass DEP
- USGS
- MWRA
- MyRWA
- SAP and QAPP in April 2015



From Nutrient Problem to Regulatory Solution



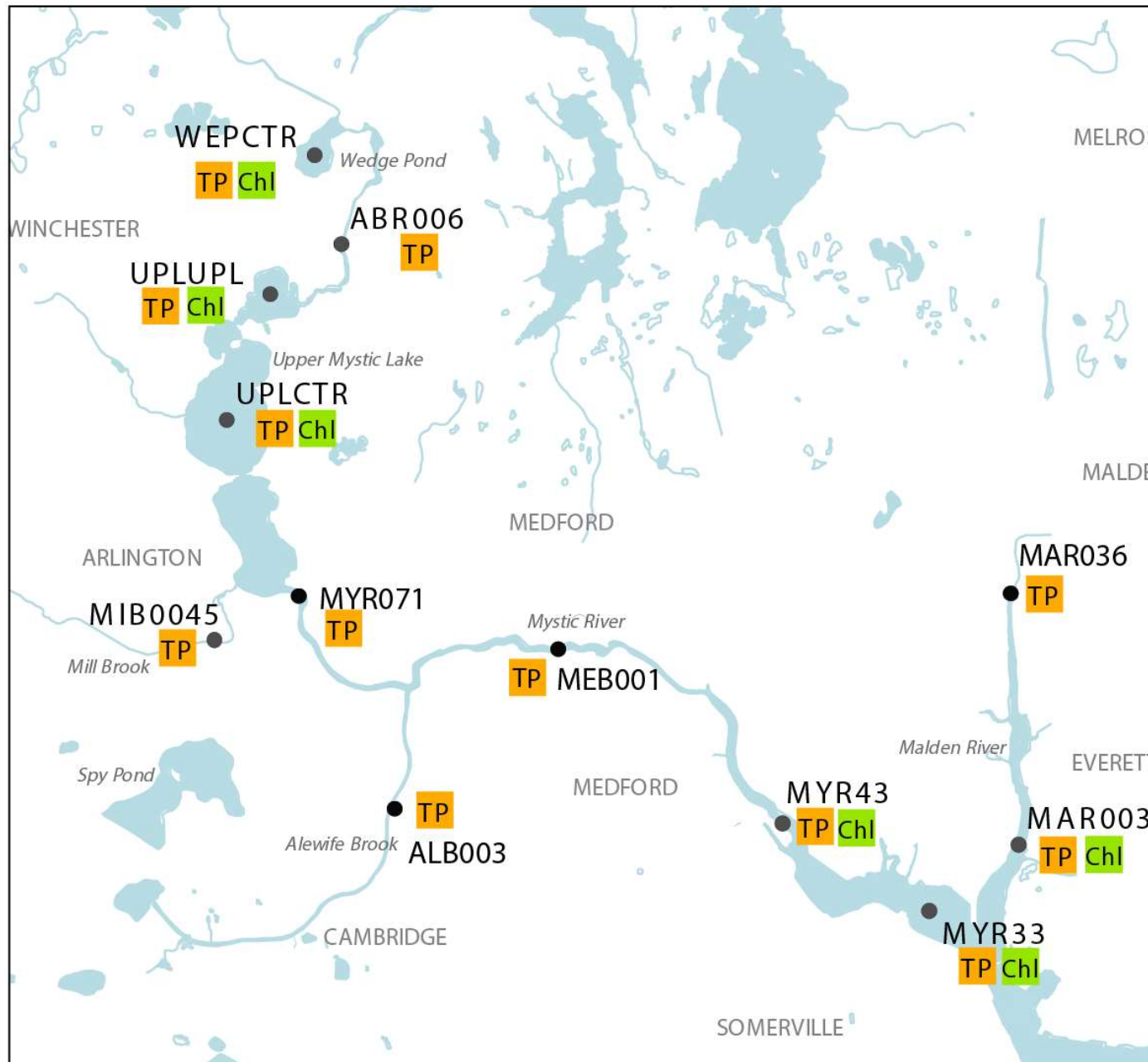




Phosphorus
in a storm

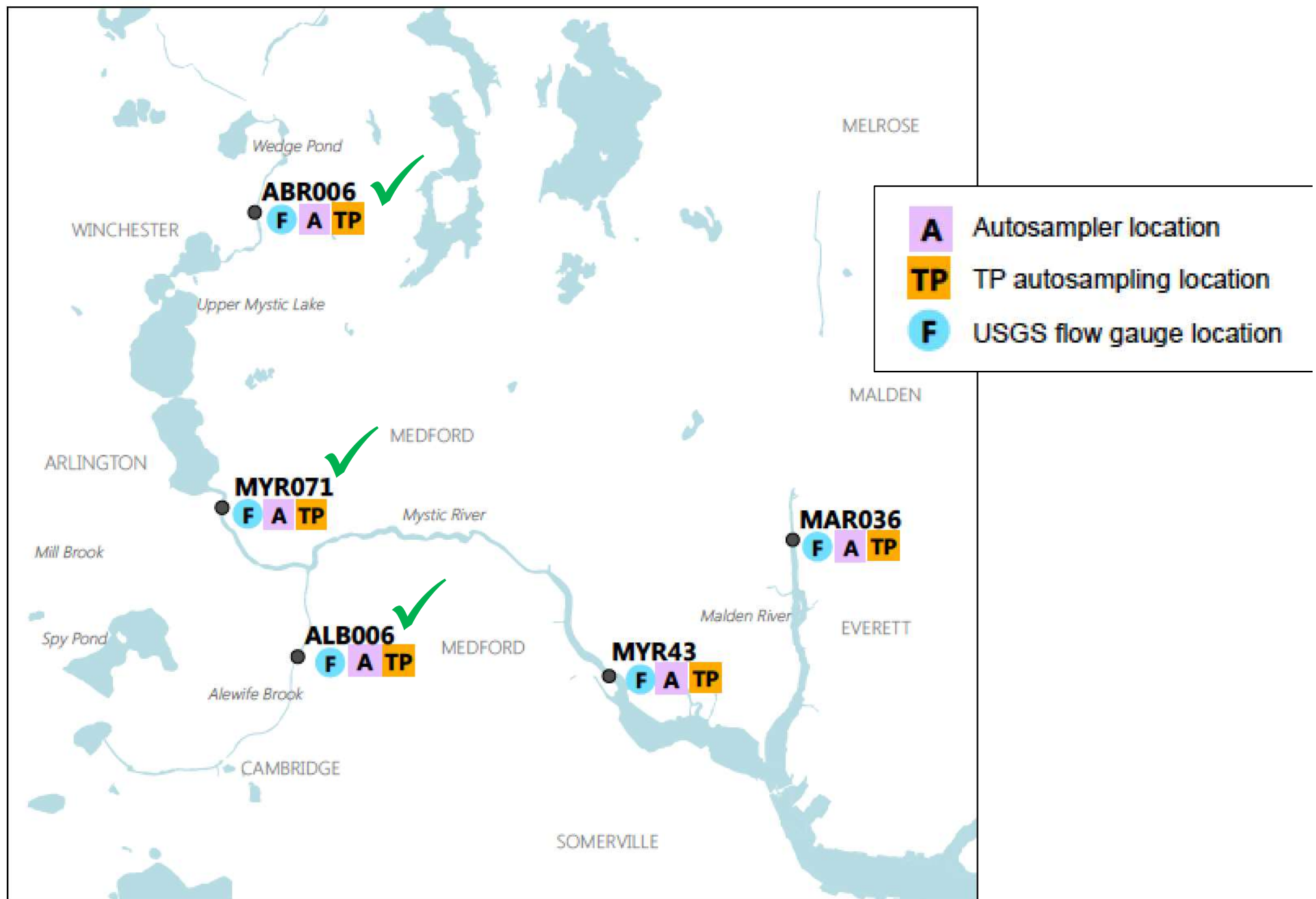
Alewife Brook
4/16/14

Phosphorus and chlorophyll grab sample locations 2016-2017



Chl Chlorophyll-a sampling location
TP TP grab sampling location

Autosampler and flow gauge locations



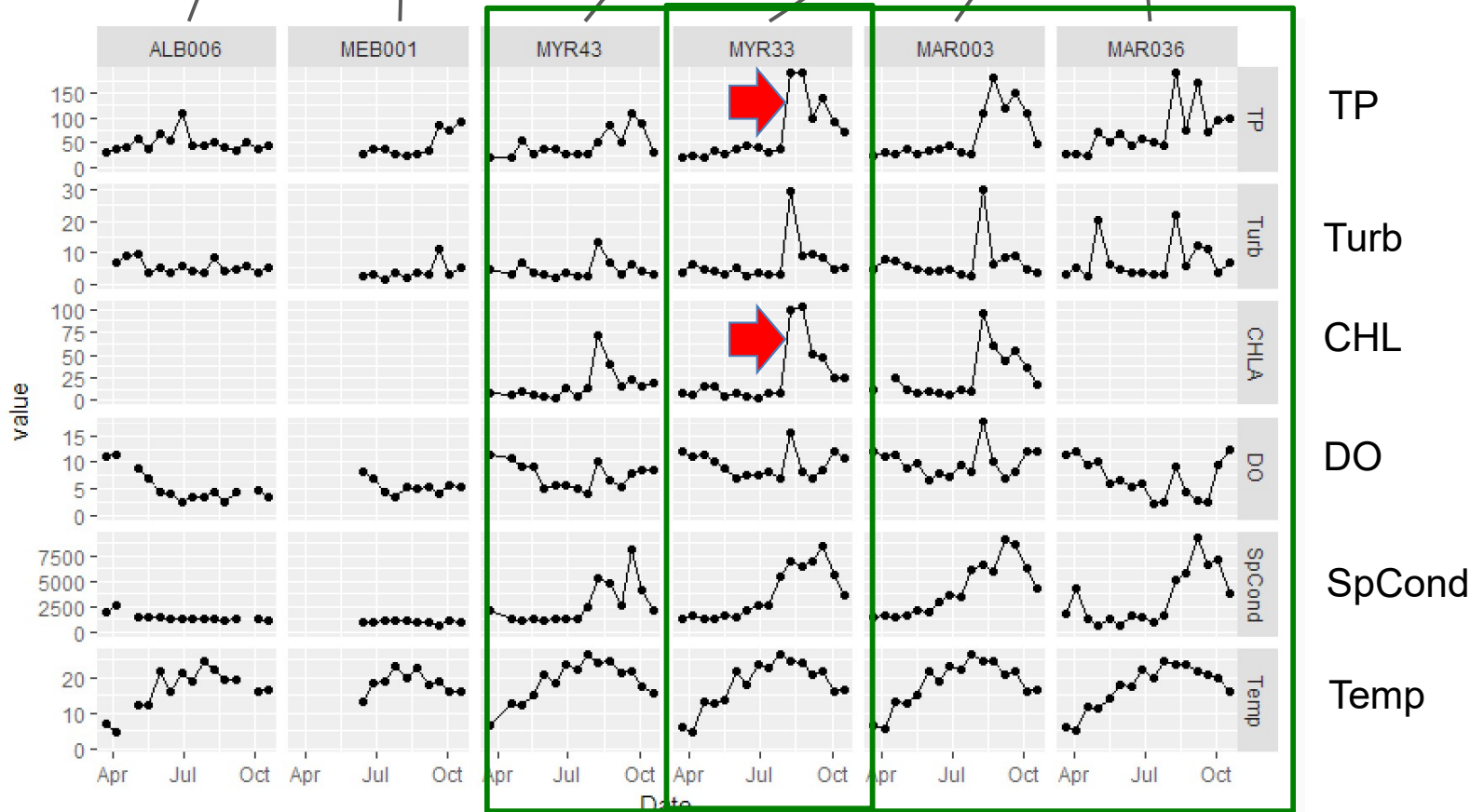
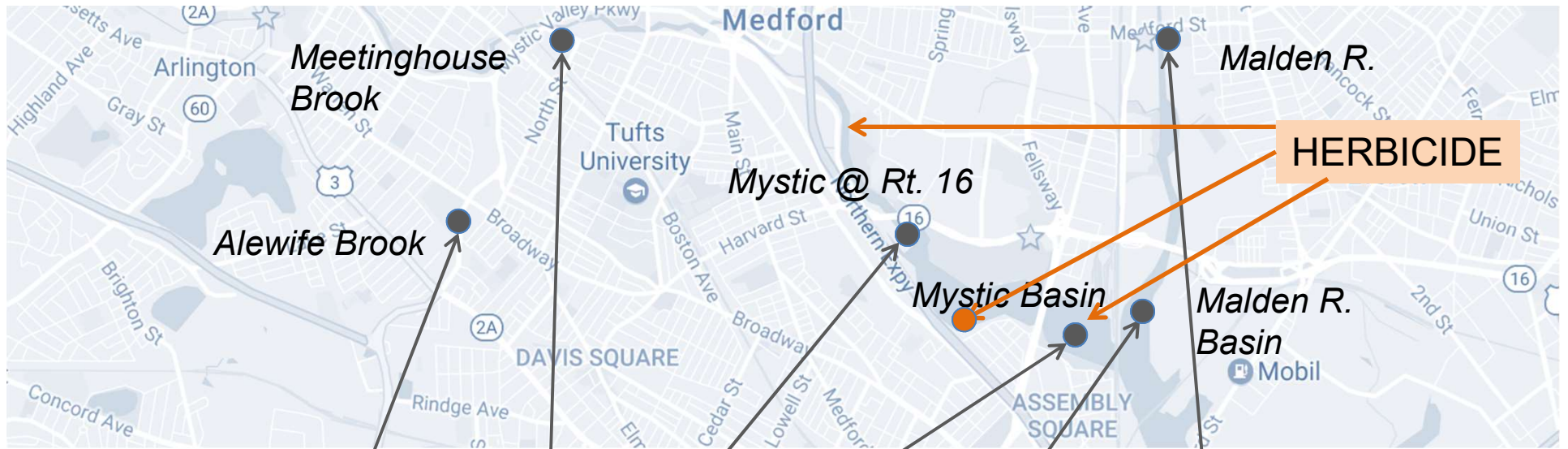


500+ visits
1500+ samples
TP, CHL, etc.

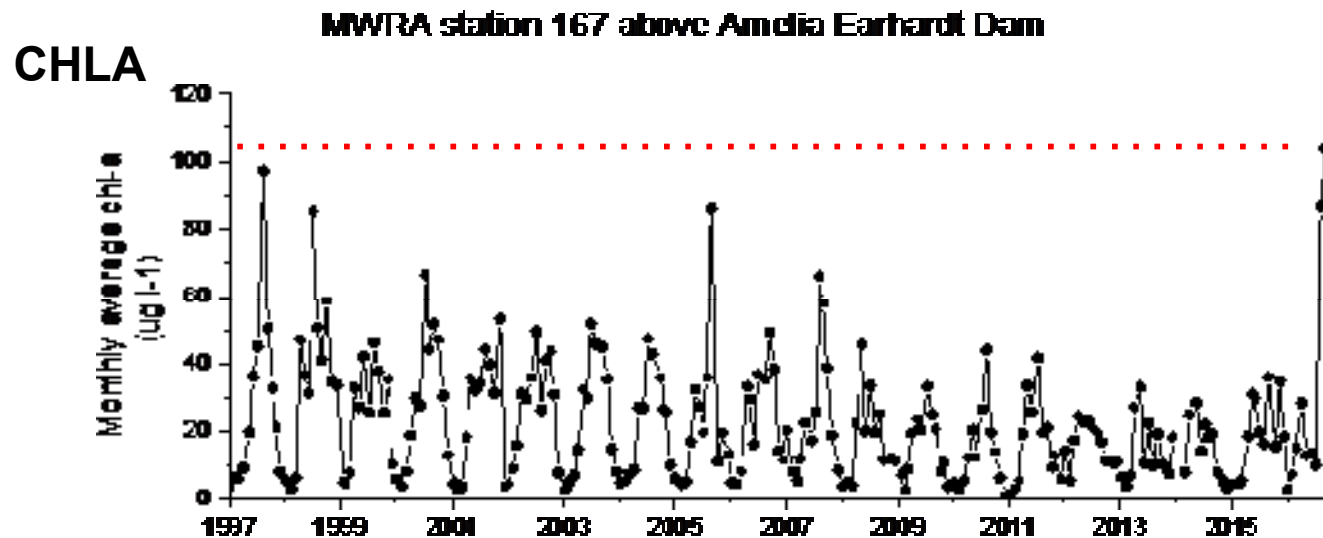
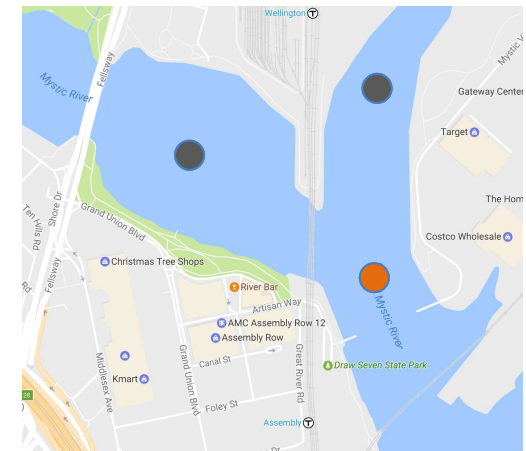
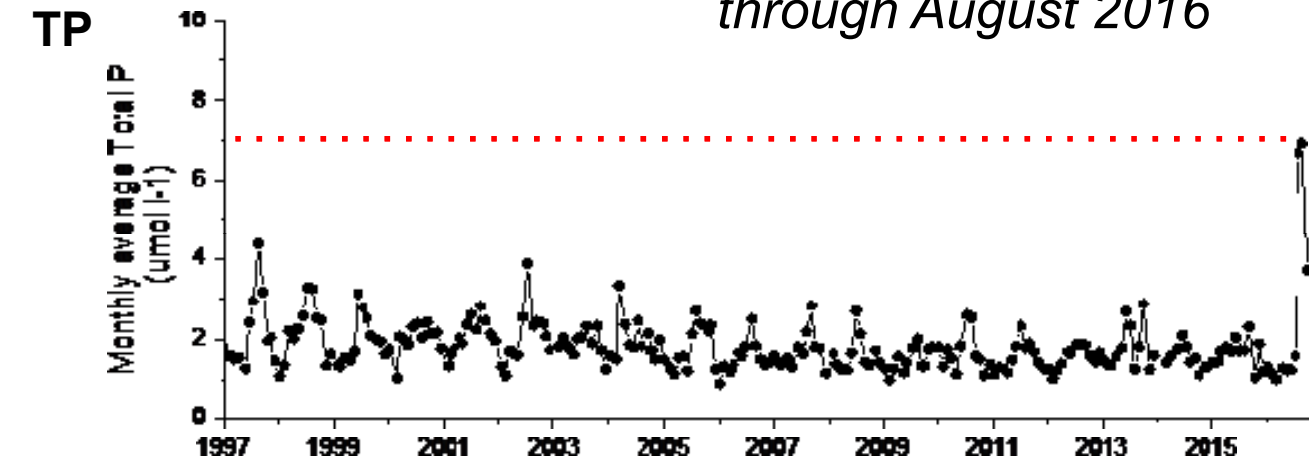
Autosamplers



Some 2016 Sampling Results



20 Years of MWRA Sampling Data at Amelia Earhart Dam *through August 2016*

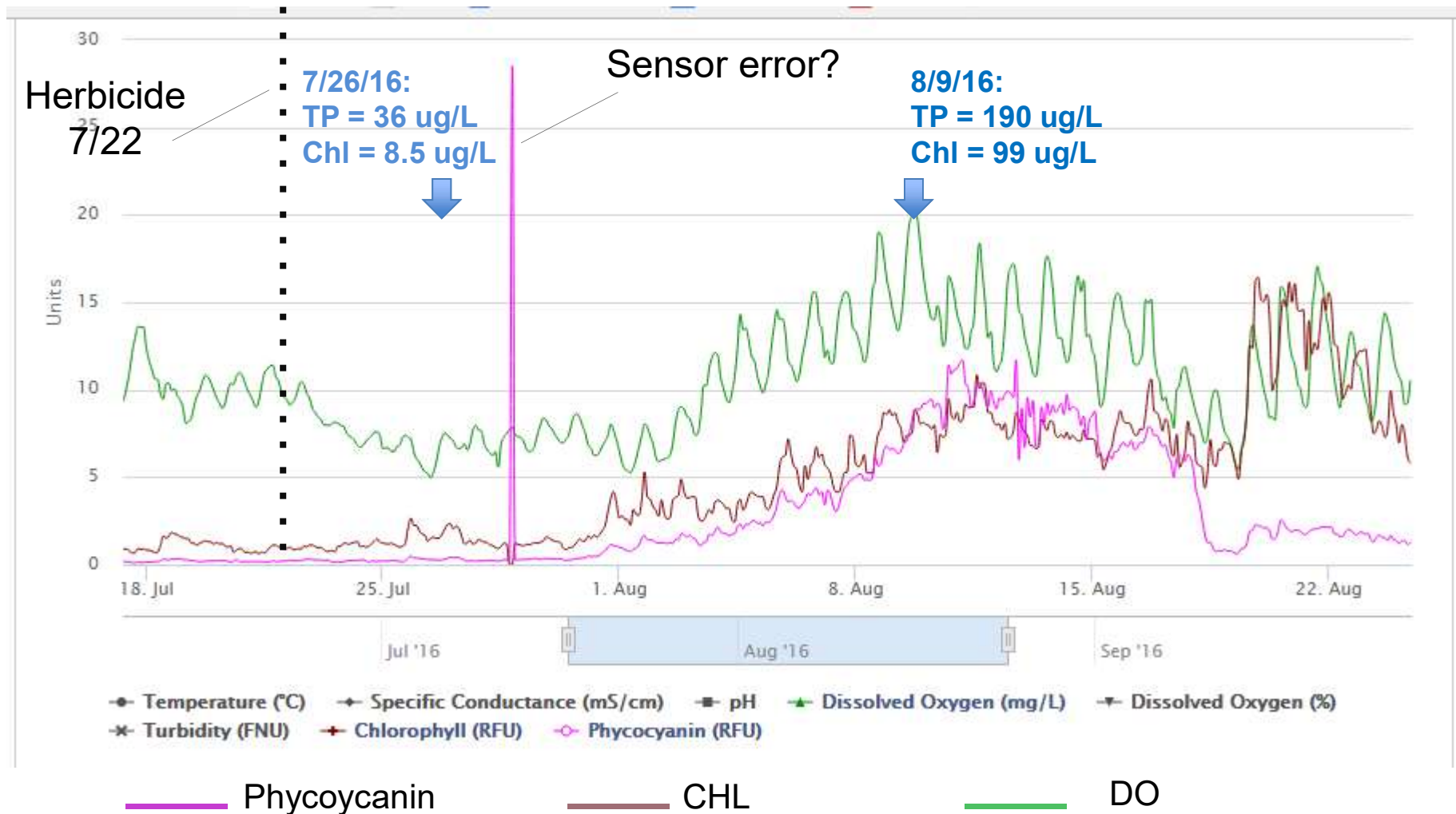


- MWRA site
- Our study sites in basin

Mystic River Cyanobacteria Bloom Summer 2016



EPA Buoy Data July-August 2016 Mystic River



Lessons

- Unintended results of management actions
- Complex tradeoffs when balancing of multiple uses of river
- Ultimate source of the problem: excess nutrients

An underwater photograph showing a large school of silver fish, likely striped bass, swimming in clear water. The fish are silvery with dark vertical stripes and are swimming in various directions. The water is clear, and the background shows the surface of the water with ripples and light reflecting off it. The bottom of the frame shows some dark, rocky or sandy substrate.

Questions?

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