

2015 Ohio River HAB Event

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ORSANCO

- The Ohio River Valley Water Sanitation Commission
 - Compact signed in 1948 (NY, PA, WV, VA, OH, KY, IN and IL)
 - Ohio River water quality monitoring
 - Developing Ohio River pollution Control Standards
 - Regional Coordination
 - Organizing stakeholders and promoting communication
 - Water Utilities; POTWs, industry and NGO interests
 - Emergency Response: spill notification and tracking

AUG

SEP

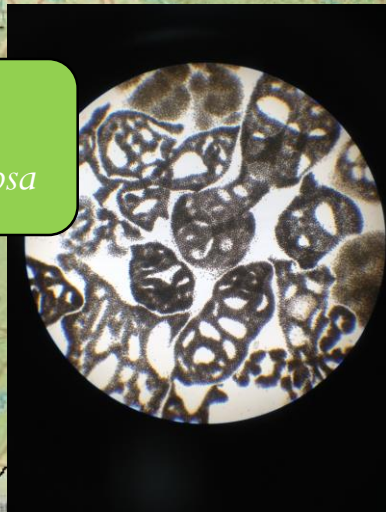
OCT

19-AUG

Reported 'paint spill' at
ORM 84

Toxin concentration
41 ug/L

Identified as
Microcystis aeruginosa



AUG

SEP

OCT

Week of
24-AUG

New Bloom
Reports

Toxin concentration
630 ug/L

Microcystis Aeruginosa
cell counts up to
31,000,000 cells/ml



AUG

SEP

OCT

Week of
1-SEP

WV, OH and KY publish HAB
notices/advisories.

First indication of bloom in
Meldahl and Markland Pools
(Cincinnati area)



AUG

SEP

OCT

Week of
7-SEP

11-SEP

- KY extends advisory further downstream.

Toxin concentration
1900 ug/L

Bloom reports extend into Indiana.
Survey of McAlpine pool finds
bloom nearly to Louisville, KY
(ORM 606) although toxin
concentrations were below advisory
threshold.

AUG

SEP

OCT

Week of
14-SEP

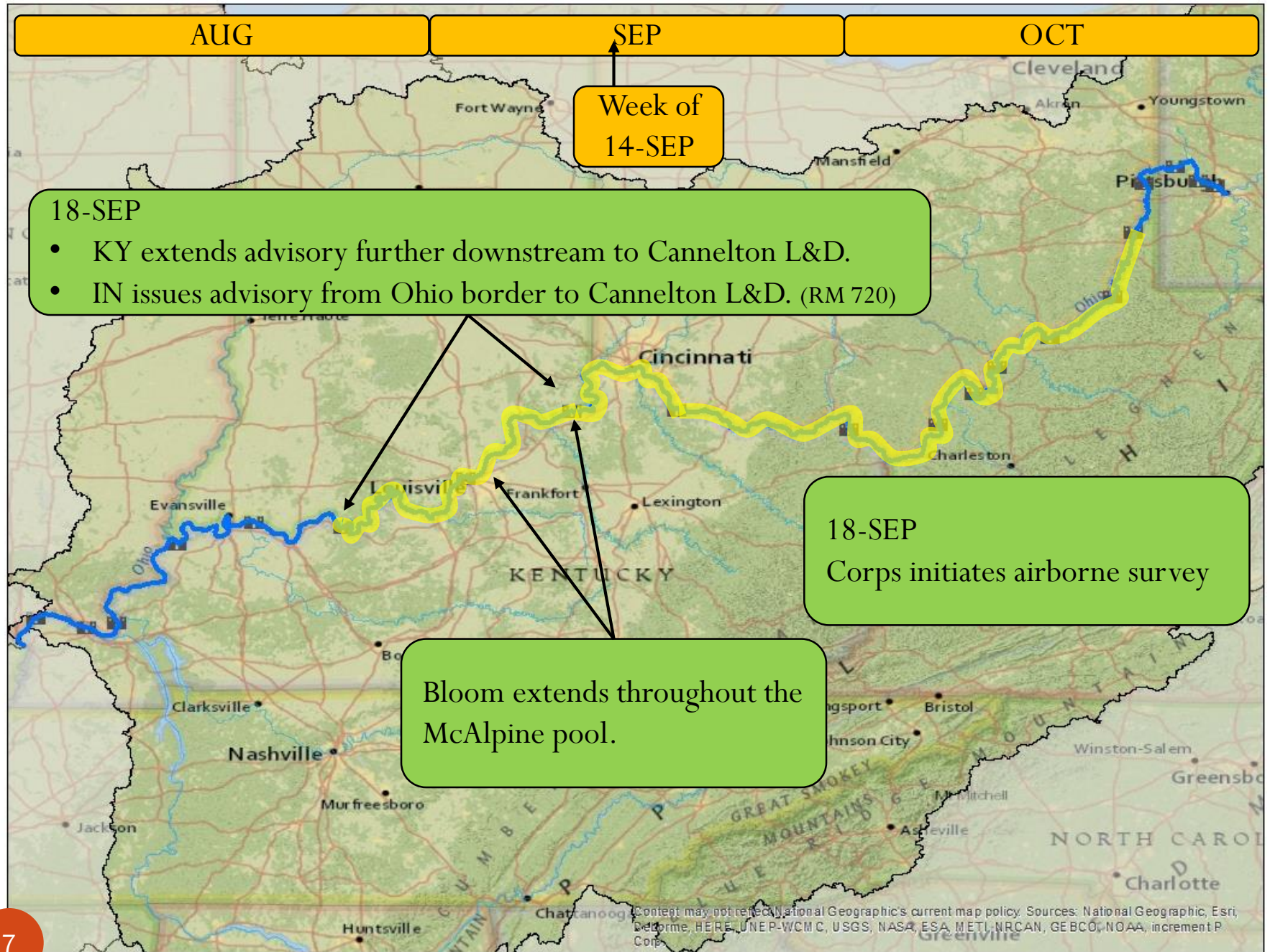
18-SEP

- KY extends advisory further downstream to Cannelton L&D.
- IN issues advisory from Ohio border to Cannelton L&D. (RM 720)

18-SEP

Corps initiates airborne survey

Bloom extends throughout the
McAlpine pool.



Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

AUG

SEP

OCT

Week of
21-SEP

Conditions persist from RM
50 to 720.

Survey identifies bloom down
to Cannelton L&D (ORM
720). Toxin concentrations
below 10 ug/L through out
the pool.

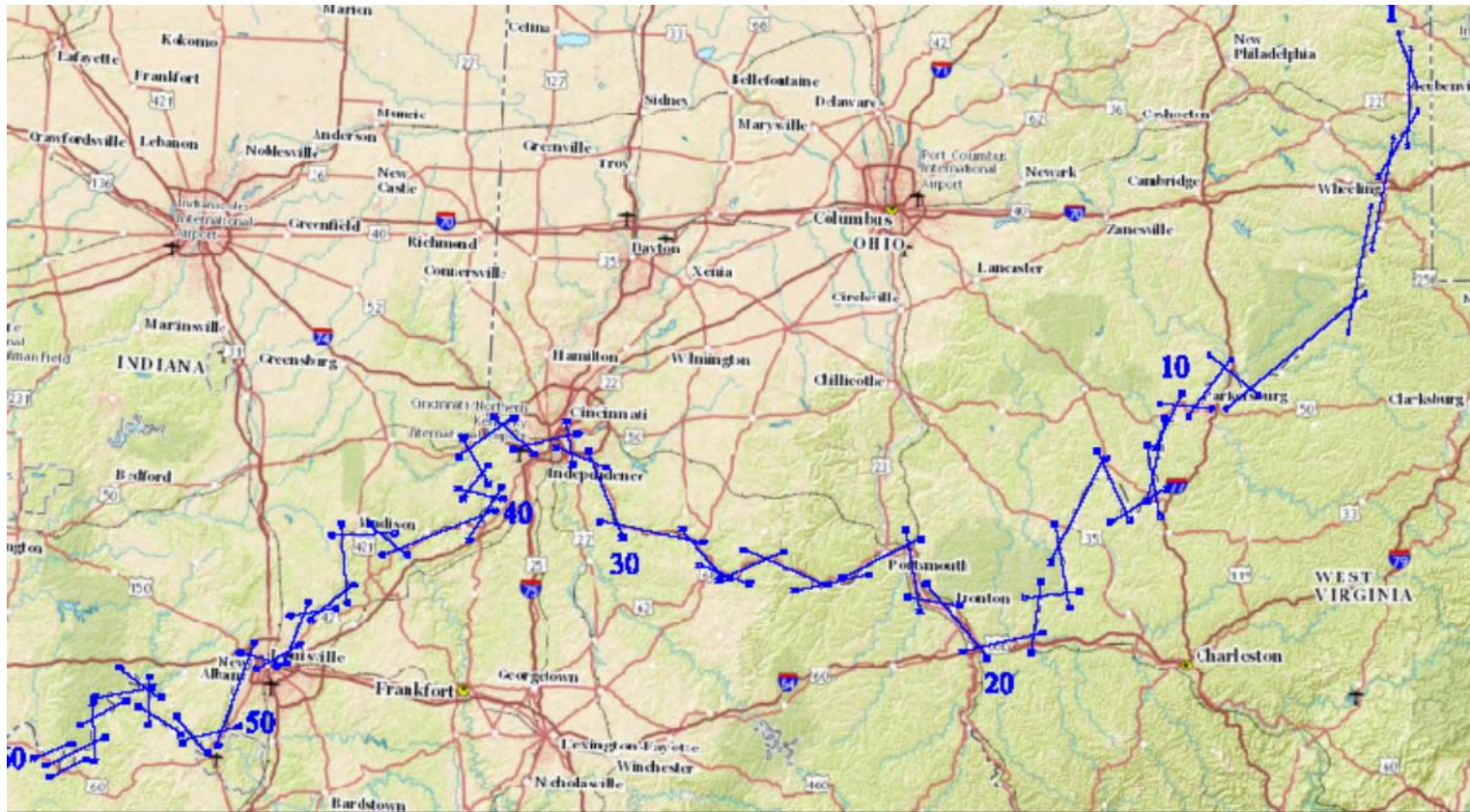
21-SEP
USACE
orthoimagery
available via
online viewer.



USACE Airborne Survey

- Orthoimagery - high-resolution, 4-band aerial images
- ADS80, with RGB/IR at 53cm resolution; 30 degree window
- 18+ hrs flying time
- Images were available within 36 to 48 hours
- The imagery is available on SmartView Connect
 - <http://maps.woolpert.com>
 - Username: jalbtex
 - Password: Airborne2015

Flight Coverage



75###

NAV

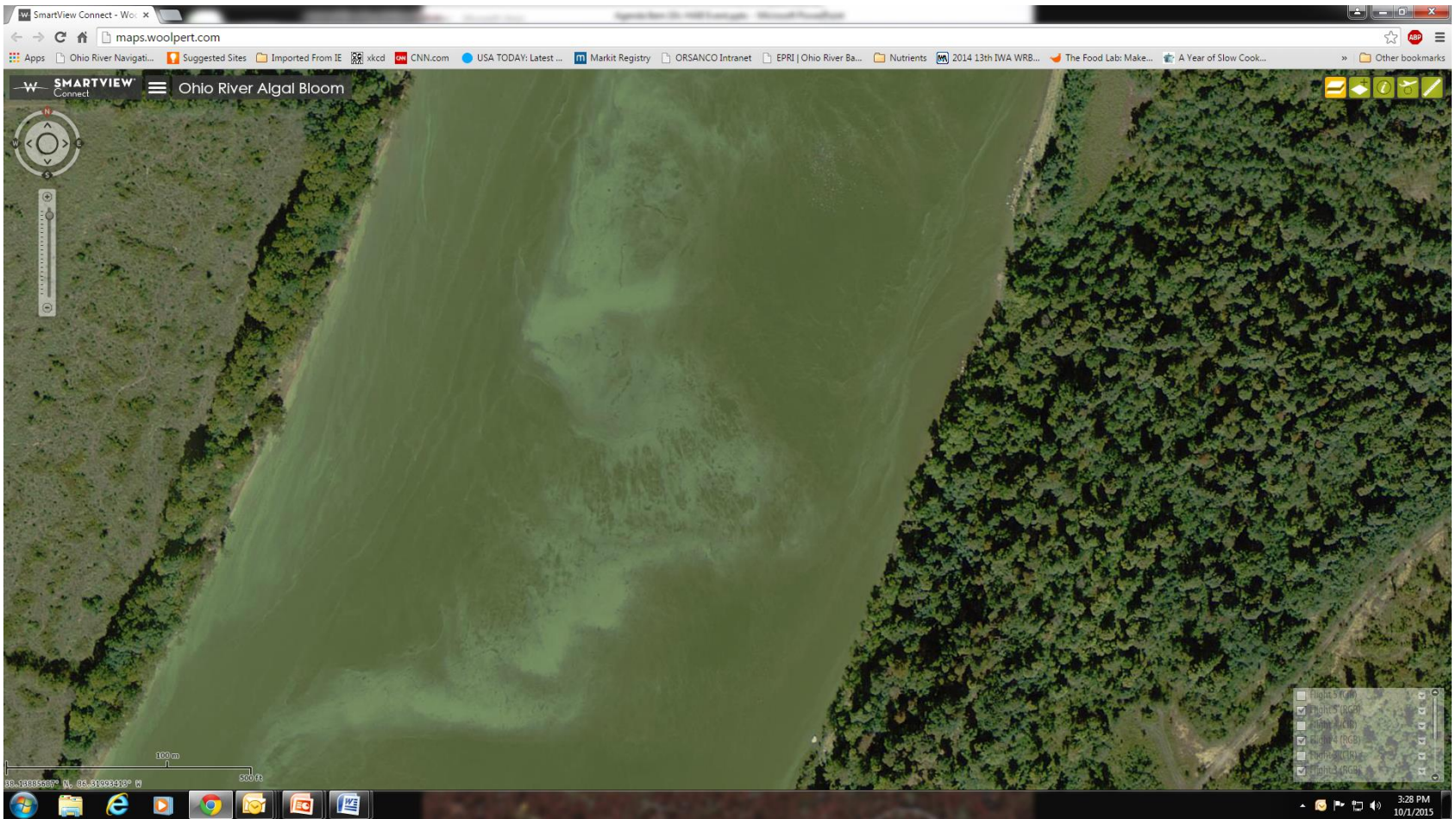
4484 Main Center Blvd

Ohio River Wheeling, WV to Louisville, KY

Coordinate System Info:	
Coord. Sys.:	<u>WGS</u>
Zone:	<u>18N</u>
Horizontal Datum:	<u>WGS84</u>
Vertical Datum:	<u>NAVD83</u>
Units:	<u>Meters</u>
To Info:	

— 53cm ADS Flights (1-60) @ 17,300' MSL

Airborne Survey Results



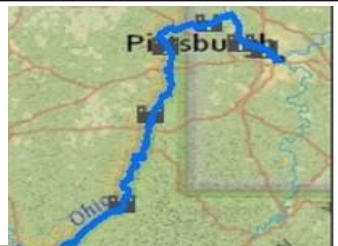
Tiltonsville, OH



Wheeling, WV



Maysville, KY (SEP 20)



Maysville, KY (SEP 22)



Maysville, KY



Shoreline Productivity



Newburgh, IN



AUG

SEP

OCT

Week of
21-SEP

25-SEP

- IL issues precautionary statement regarding HABs.

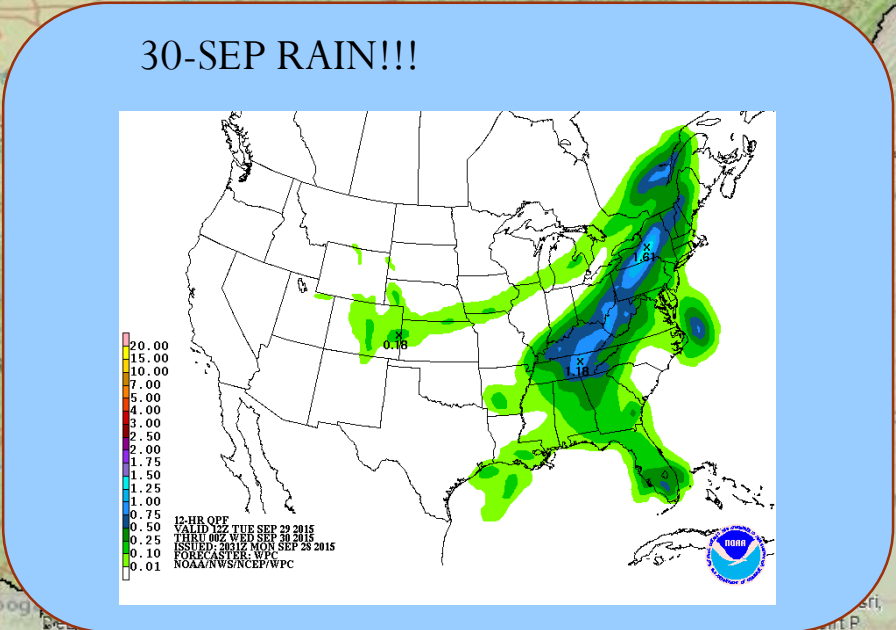
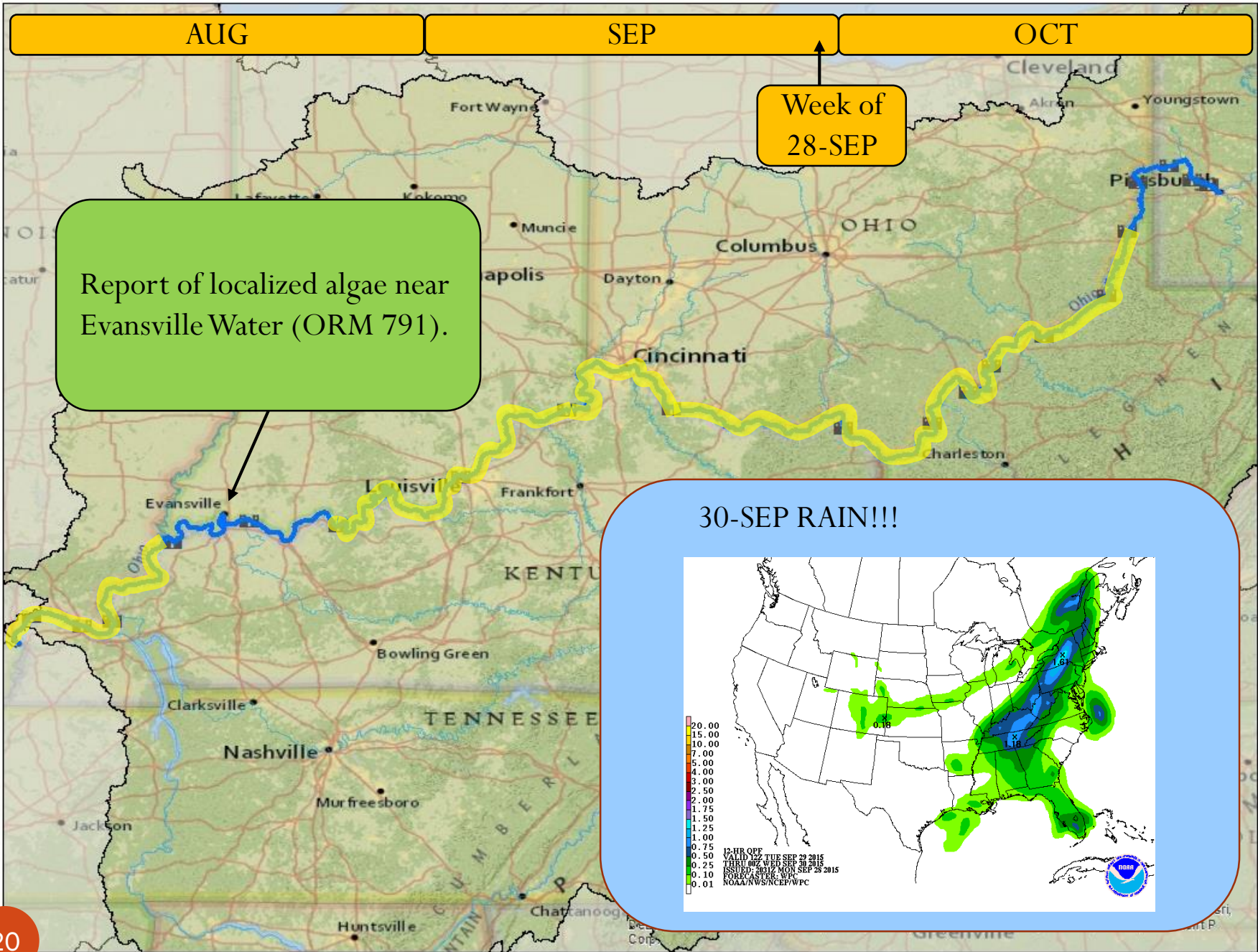
AUG

SEP

OCT

Week of
28-SEP

Report of localized algae near
Evansville Water (ORM 791).



AUG

SEP

OCT

Week of
5-OCT

Algae visible at Newburgh
L&D (ORM776)

Widespread reports of improving
conditions in the upper river.

AUG

SEP

OCT

Week of
12-OCT

16-OCT

- KY removes advisory for Cannelton and McAlpine Pools

AUG

SEP

OCT

Week of
19-OCT

20-OCT

- WV and IN lift advisories

22-OCT

- IL lifts advisory

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AUG

SEP

OCT

As of
29-OCT

Crews are gathering additional data to support lifting the remaining advisories.

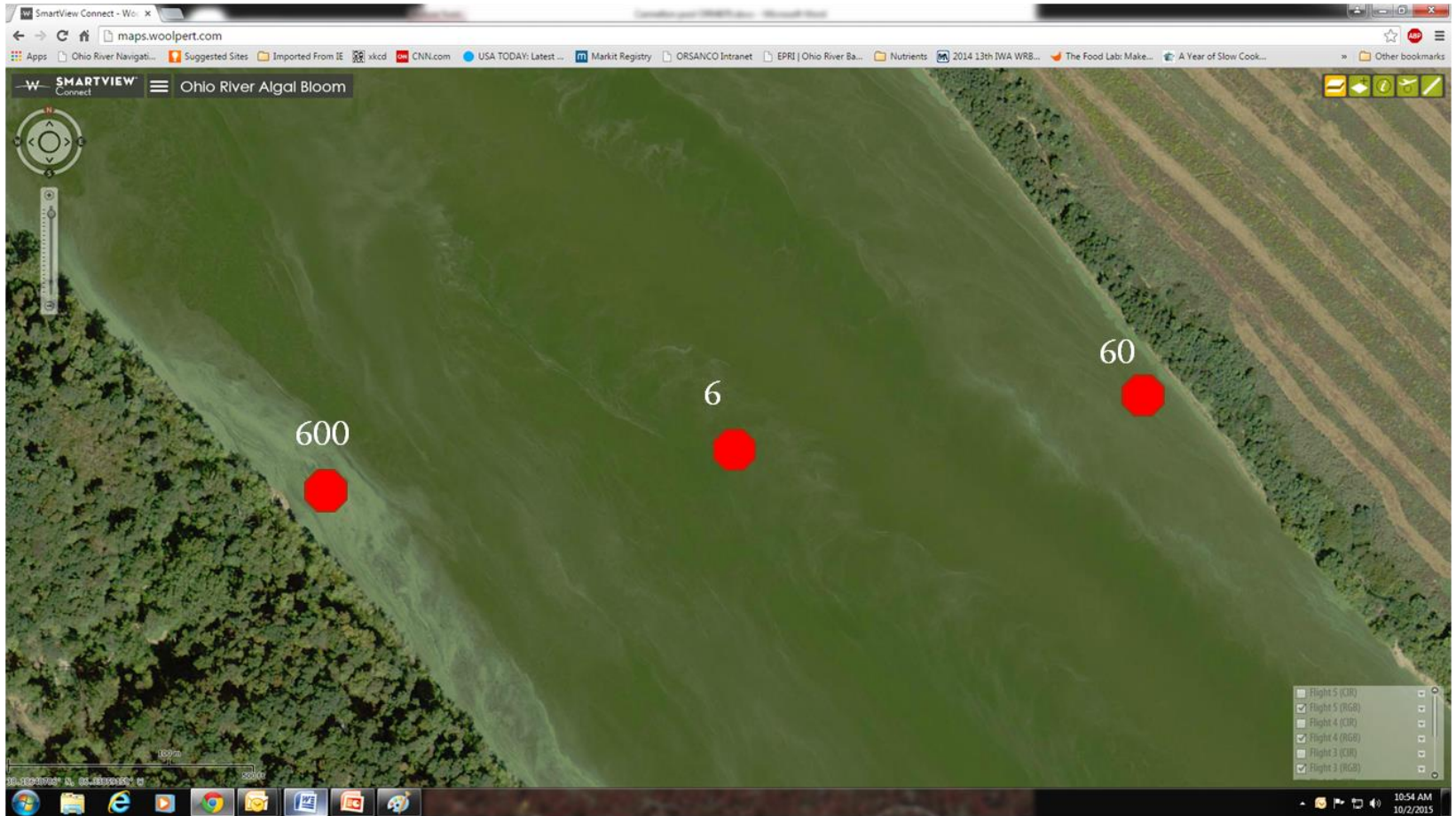
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Sampling Efforts

- ORSANCO sampling crews conducted 14 surveys. Focus was on extent.
- PA, WV, OH, KY, IL all had crews sampling sections of the river and their tributaries
- US EPA and Corps of Engineers provided sampling crews
- Aerial Surveys:
 - WV DEP – 2 from Huntington to Sistersville
 - OEPA – 1 survey from Cincinnati to Marietta
 - Corps of Engineers- 1 survey from river mile 50 to 850.
 - NASA – 2 localized surveys with hyperspectral imaging



Where To Sample?

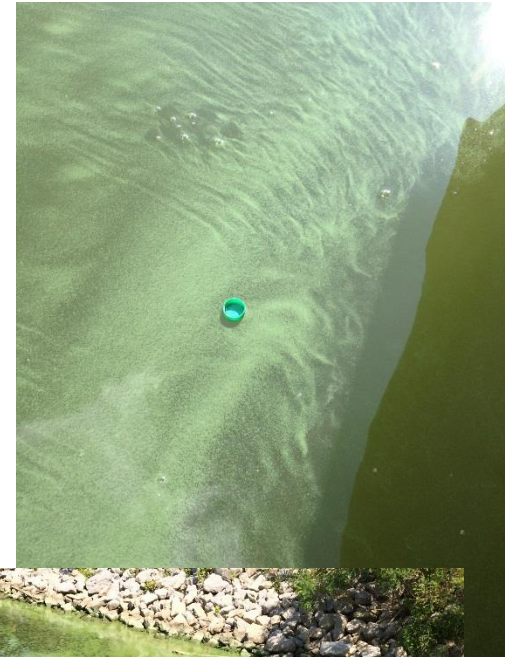


Where To Sample?



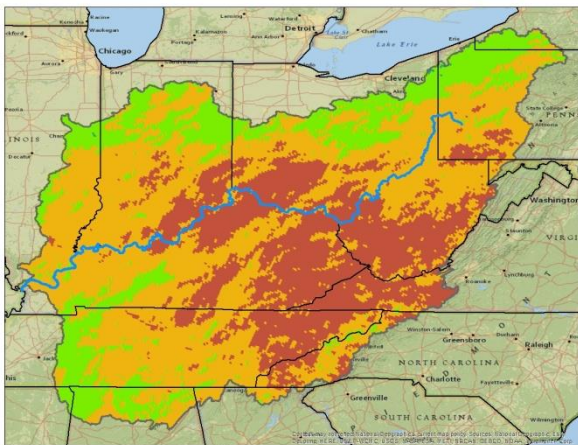
Why did this happen?

- Precipitation?
- Flow?
- Clarity?
- Nutrients?
- Nutrient Ratios?
- Nutrient availability?
- Herbicides?
- Zebra mussels?

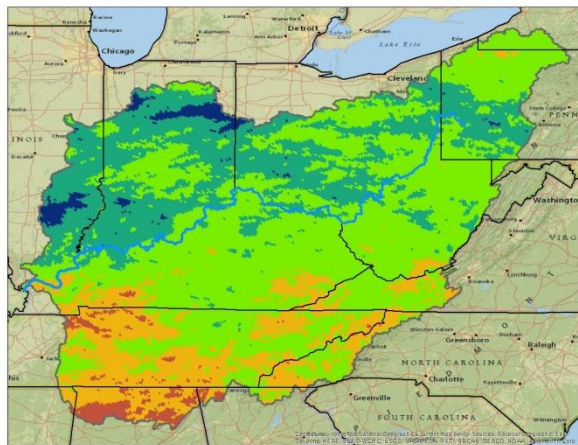


Summer 2015 Monthly Precipitation Relative to Normal

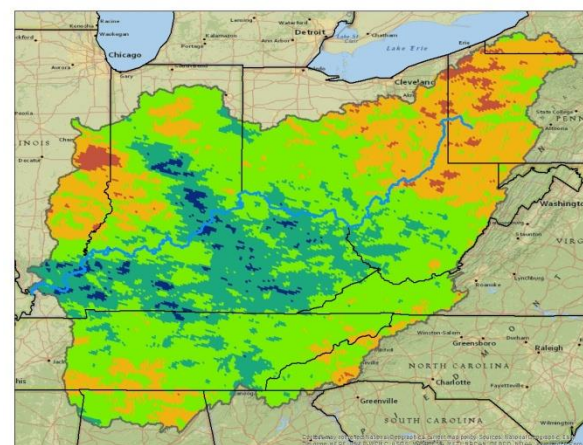
May



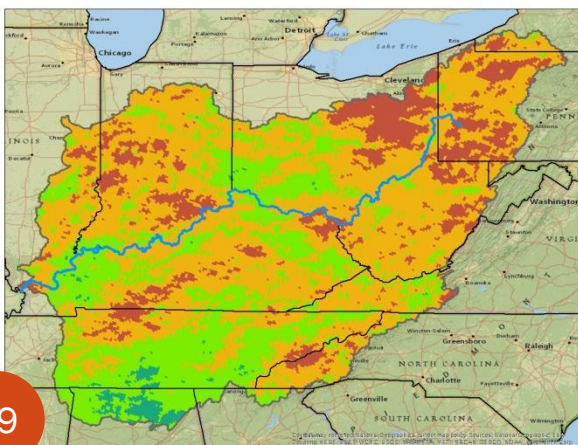
June



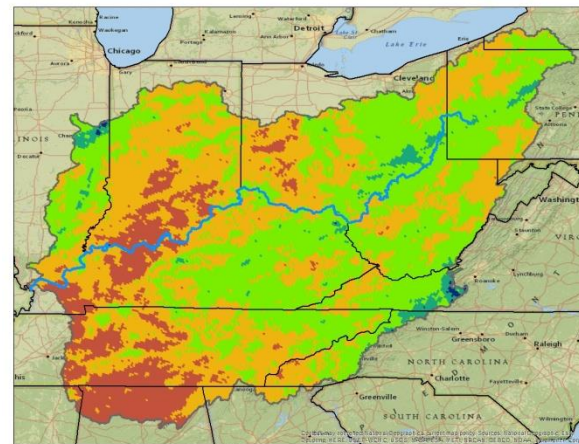
July



August



September



Percent of Normal Rainfall (2015)

- 0.00 - 50.00
- 50.01 - 100.00
- 100.01 - 200.00
- 200.01 - 300.00
- 300.01 - 530.00

Post-HAB

- After action report
 - What did we do right?
 - What did we miss?
 - Improvements to our Response Plan
 - What should our future sampling protocol be?
 - Analysis of cause
- Available data for analysis
 - ORSANCO routine sampling
 - Bi-monthly nutrients
 - Continuous DO monitors
 - Water utilities
 - Temp
 - Turbidity
 - Event sampling
 - toxin, nutrients, species data from multiple States, Federal Agencies and ORSANCO
 - Satellite imagery

Questions ?



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