

# Source Water Monitoring

## Early Warning Event Detection

Brendt Thompson

Scan Measuring Systems

## Why do we monitor?

- Early warning for detection of unusual anomalies
  - Elk River, WV
  - Coal Ash Pond, NC
  - Hinckley, CA
  - Camp Lejeune, NC
- Treatment plant optimization
  - Rainfall events
  - Seasonal turnover
- Long term watershed changes
  - Watershed urbanization
  - Climate change
  - New upstream discharge

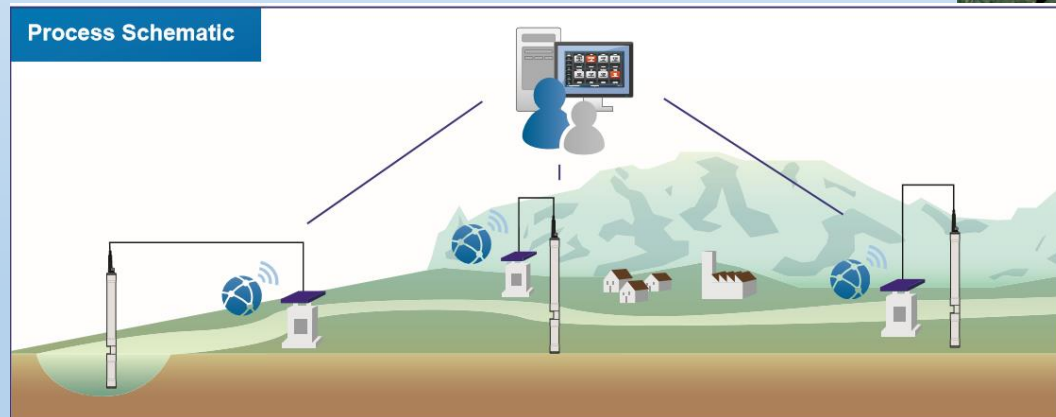
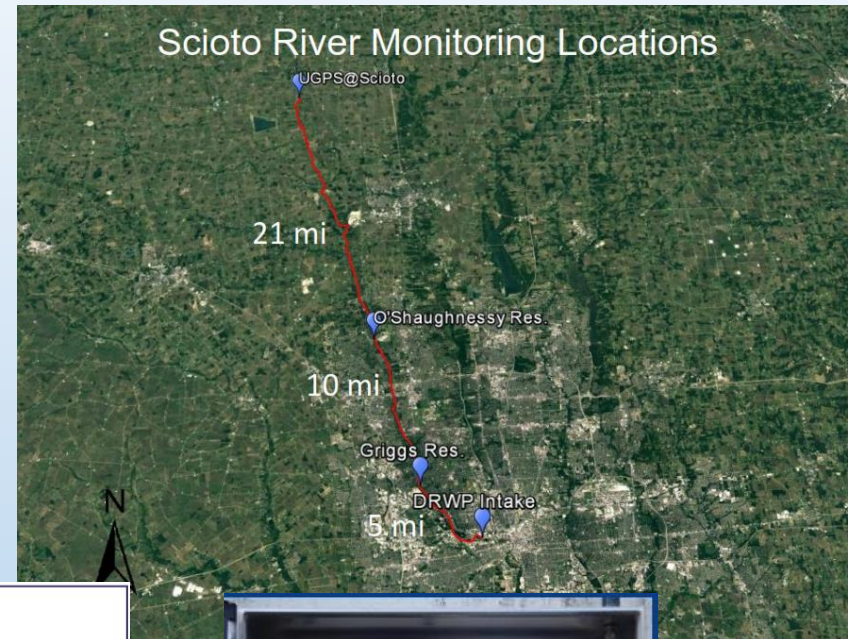
### REASONS TO IMPLEMENT SOURCE WATER MONITORING

- Provide information to facilitate protection of the public water supply for all intended uses
- Observe long-term trends in source water quality to prepare for future challenges or regulations
- Detect and respond to contamination incidents
- Optimize treatment processes to improve finished water quality and reduce costs
- Develop information that supports regulatory compliance
- Investigate and identify pollution sources and potentially responsible parties

\* "Online Source Water Monitoring" Guidance Document (EPA, 2016)

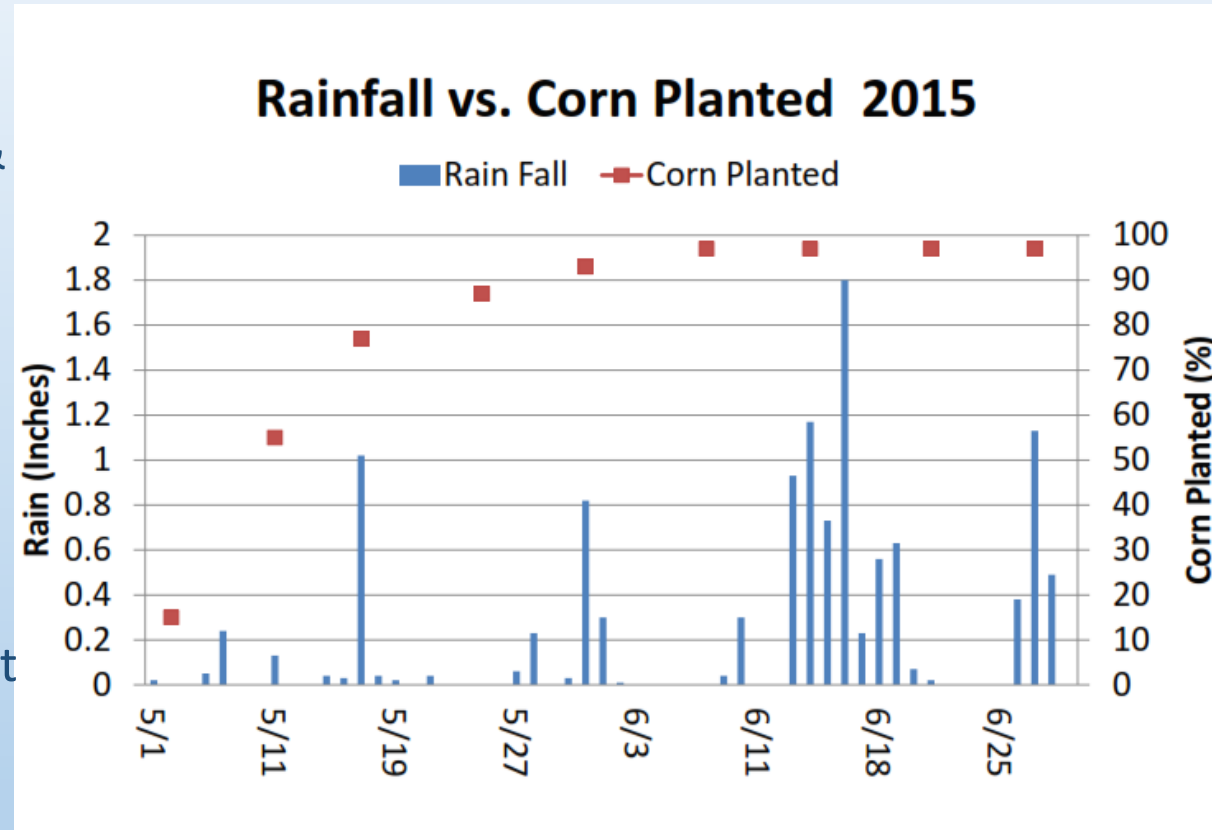
## The Installations

- 4 s::can Remote Monitoring Stations deployed along 30 miles of the Scioto River
- Each Station monitoring NO<sub>3</sub>, TOC, DOC, NTU, UV<sub>254</sub>, UV<sub>436</sub> via a single instrument the spectro::lyser
- Data is transmitted back to DRWP via 3G cellular communication



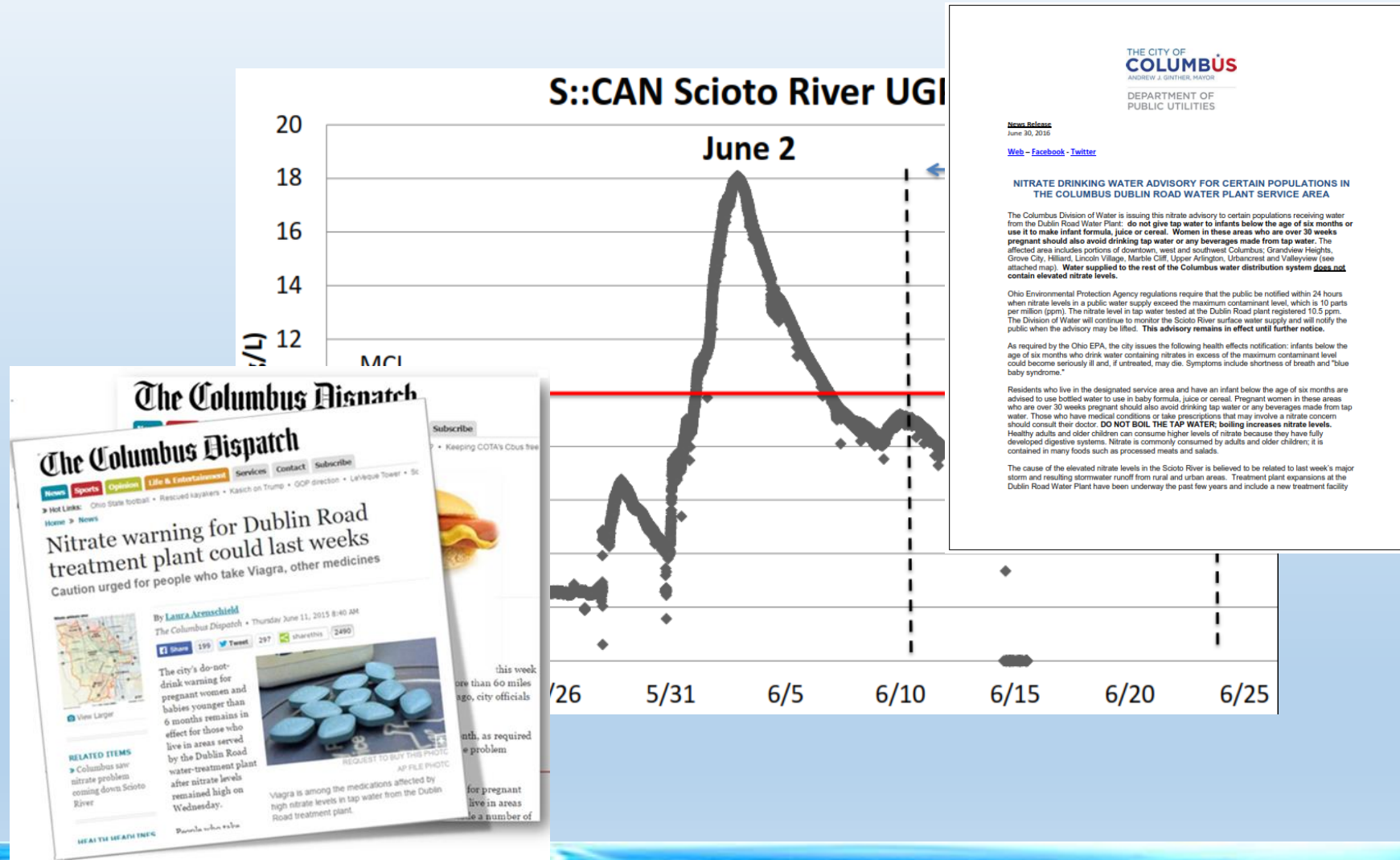
## The Perfect Storm

- Nitrogen is applied as a fertilizer to agricultural & residential land; bacteria in the soil convert N to NO<sub>3</sub>
- Highly leachable and moves readily through the soil
- NO<sub>3</sub>-N is not removed with current treatment at DRWP
- Maximum Contaminate Level = 10mg/L NO<sub>3</sub>-N

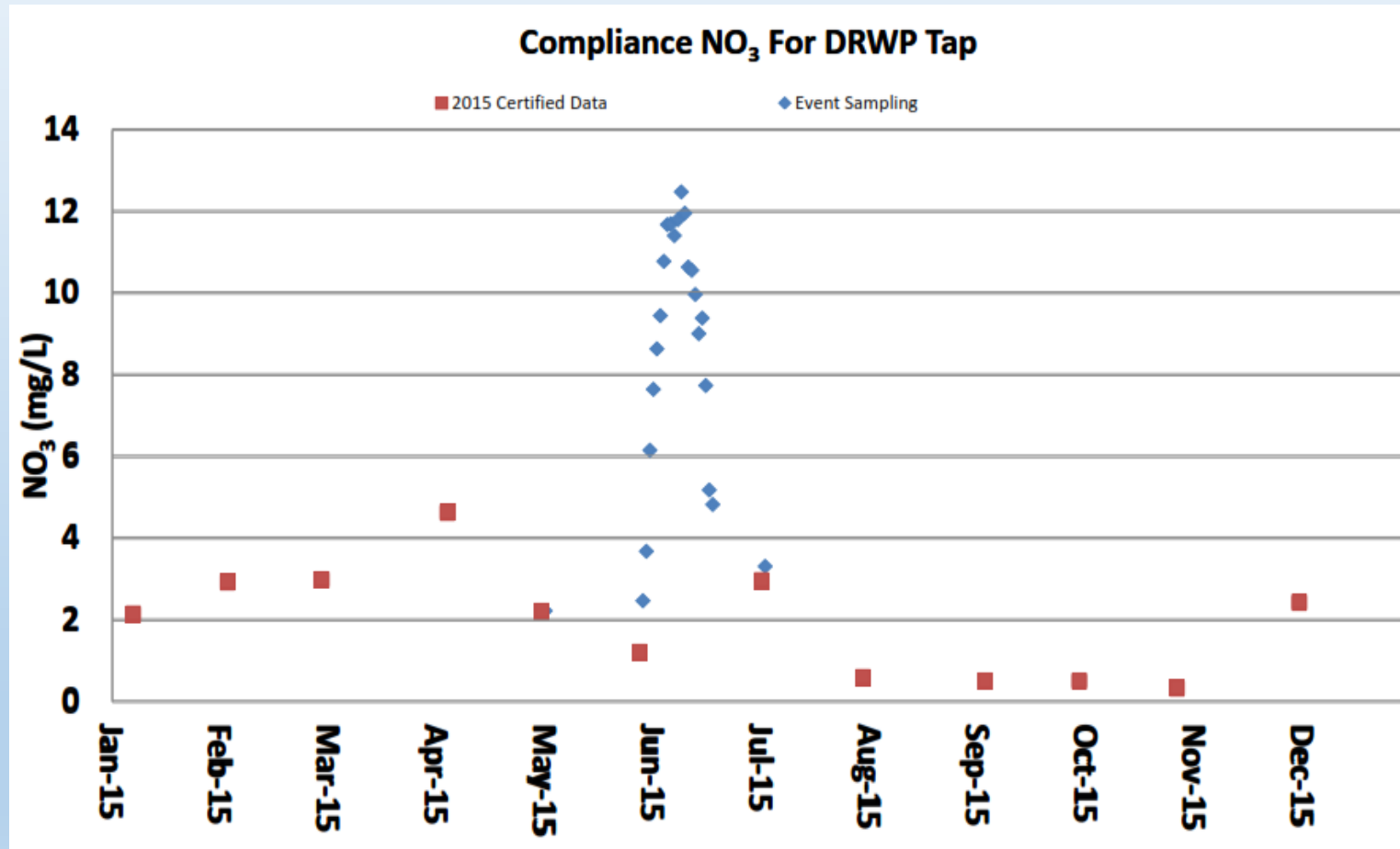


# Case Study: Dublin Road Water Plant – Columbus, OH

## The Event



## The Event (almost missed)



## Summary

- Early warning technologies played a huge role in preparing the City for an impending Tier 1 MCL Violation
- It allowed the City to be proactive and transparent
- If the City only relied on Regulatory Compliance Monitoring, the event would have been missed
- The WQAL was able to set up staff to manage the sampling and analysis



## References

- “Online Source Water Monitoring” Guidance Document (EPA, 2016)
  - [https://www.epa.gov/sites/production/files/2016-09/documents/online\\_source\\_water\\_monitoring\\_guidance.pdf](https://www.epa.gov/sites/production/files/2016-09/documents/online_source_water_monitoring_guidance.pdf)
- “Distribution System Water quality Monitoring Sensor Evaluation” (EPA, 2009)
  - [https://www.epa.gov/sites/production/files/2015-06/documents/distribution\\_system\\_water\\_quality\\_monitoring\\_sensor\\_technology\\_evaluation\\_methodology\\_results.pdf](https://www.epa.gov/sites/production/files/2015-06/documents/distribution_system_water_quality_monitoring_sensor_technology_evaluation_methodology_results.pdf)
- “Event Detection Systems Challenge” (EPA, 2013a)
  - [https://www.epa.gov/sites/production/files/2015-07/documents/water\\_quality\\_event\\_detection\\_system\\_challenge\\_methodology\\_and\\_findings.pdf](https://www.epa.gov/sites/production/files/2015-07/documents/water_quality_event_detection_system_challenge_methodology_and_findings.pdf)
- “The City of Columbus’ 2015 Nitrate Event” (Michele Gilkerson and Ben Ellsesser)