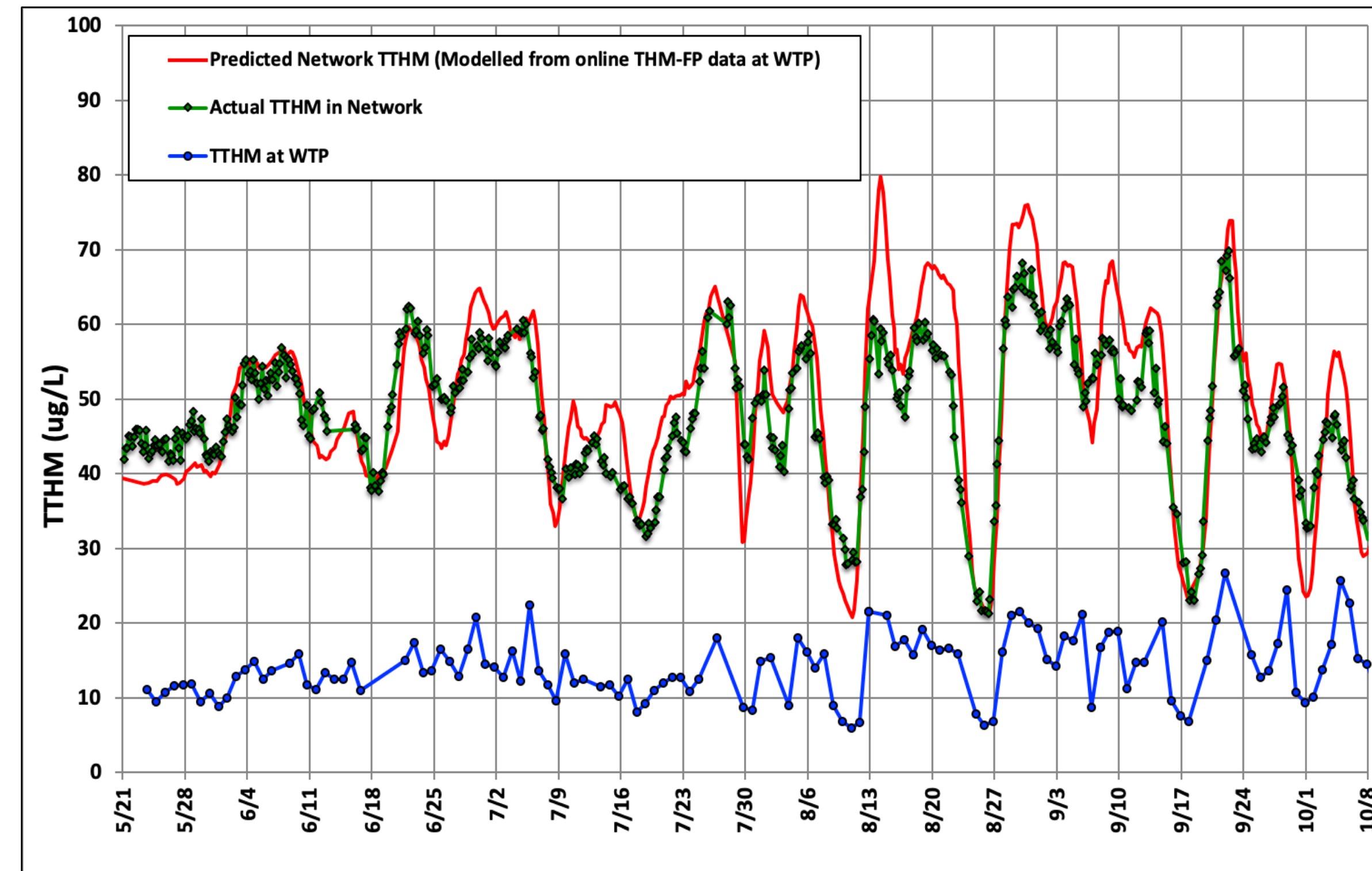


# Real-Time Predictive Data for THM Formation in Water (THM-100 FP)

## What is unique about the THM-100 FP technology?

- Delivers to water treatment plants (WTPs) accurate and reliable, time sensitive, real-time high-density levels of Trihalomethane Formation Potential (THM FP) and Trihalomethane Predicted Network (THM PN) data for raw water sources and treated waste and drinking water.
- Analytical method is specific to THM FP and THM PN and patent protected.
- Incorporates self-calibration and validation to ensure accurate (+/-5%) and repeatable (+/-5%) data. This reduces the risk of false positives and negatives.
- Incorporates remote self-diagnostic performance monitoring of the analyzer in order to deliver >99.5% uptime and ensures mission critical data is available, to control service levels and support continuous design improvements in the technology.
- Unique 5-year warranty for parts and labor.



## What problem did this aim to solve?

THMs are a carcinogenic, regulated disinfection by-product (DBP) and a proxy indicator for the presence of hundreds of other carcinogenic contaminants found in chlorinated drinking and wastewater.

WTPs lack real-time accurate and reliable THM FP and THM PN data of raw or treated water in order to make timely operating decisions on the use of raw water sources or the treatment processes to reduce the presence of DBP precursors in raw water or THM levels at the consumers' tap, while achieving regulatory compliance (80 ppb TTHM) because:

- THMs (and other DPBs) once formed in the disinfection process, increase in concentration with water age and temperature across a water distribution network.
- THM FP of raw and treated water can change rapidly and impose substantial costs on WTPs to meet regulatory standards by either removing the organic precursors of THMs or the THMs once formed.
- No competitive online THM FP or THM PN monitoring technologies. Labs cannot deliver this data in real-time.
- Data-as-a-Service addresses funding constraints of utilities and their requirements for high density THM FP and THM PN data for process optimization system characterization, design and evaluation of alternative THM remediation systems

## What is the value proposition?

Real time THM FP data enables WTPs to:

- **optimize** blends of raw water sources in order to achieve compliance with regulatory standards for TTHMs at minimum cost.
- **minimize** TTHM formation in single source surface water treatment plants by managing throughput of WTP and use of storage to adjust production volumes according to the level of TTHM precursors in raw water supplies while maintaining service levels, potentially avoiding costly treatment plant investments.
- **optimize** current treatment methods based on the predicted network level of THMs (THM PN) in water at the consumer's tap (the regulatory point) that is remote (time and distance) from the WTP, rather than relying on measurements of only those THMs that have formed in the treated water leaving the plant.
- **optimize** the design of THM remediation systems based on high frequency accurate and reliable data vs infrequent laboratory sampling for which the accuracy specification is typically only +/-25%.
- **accelerate** evaluation of THM treatment system pilots and new build, thereby reducing time and cost of validating new treatment technologies and the acceptance of THM remediation projects.

## The Experience

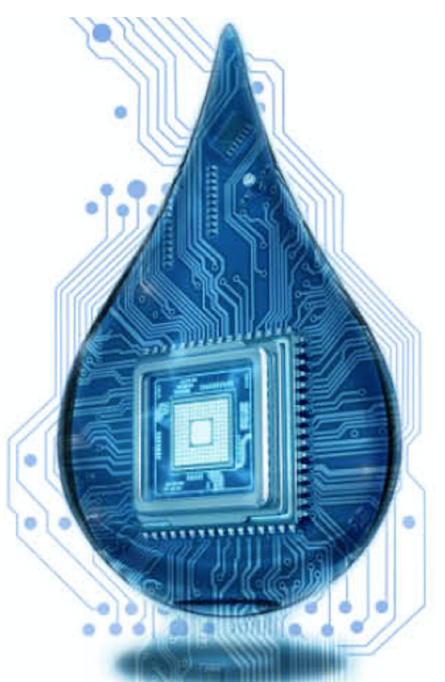
- Laboratories in Europe have been awarded ISO accreditation for the using **THM-100 instruments for online regulatory monitoring at remote network locations.**
- THM-100 has been independently demonstrated in USA and Europe to be **more accurate and reliable than laboratory based methods** for THM and THM FP analysis.
- **THM-100 FP has been widely adopted by WTPs in USA and Europe** as the only viable means of predicting THM formation. Several US & European WTPs have acquired multiple analyzers for strategic management of WTP & network operations, and contractual compliance with other water utilities.
- **Independently validated by University of Massachusetts** as being the most accurate and reliable online instrument for real-time analysis of THM FP of raw water. Currently supporting Hazen and Sawyer project with NYC DEP.
- **Adopted by several US wastewater treatment plants** (WWTPs) for NPDES compliance to sub-ppb levels.
- **Integrated by leading THM treatment system vendors** into their product offering (e.g. Evoqua, Medora, PAX).
- **Adopted by semiconductor plant** to control quality of municipal water purchases to sub-ppb levels.
- **Performance and ROI (<6 months) widely cited** in US and international conferences papers by consulting engineers and WTPs/WWTPs.

## What does this mean for the future?

- An approved method for regulatory compliance monitoring based on requiring continuous compliance with permitted excursions and tighter tolerances (+/-10%) vs current compliance monitoring every 90 days with +/-25% tolerances?
- Consumers have access to THM data **before** they consume or bathe not 90 days **afterwards** to enable them to make informed consumption decisions?

See: <http://www.tthmalert.com>

**TRANSFORMING THE WAY WE SEE WATER**



The above is available to utilities and consulting engineers with **Data-as-a-Service pricing**