

Real-Time Water Quality at Scale: Xylem DC Rivers Monitoring Platform

How a landmark partnership delivered continuous, public-facing water quality data across the Anacostia, Potomac, and Shenandoah rivers

9

REAL-TIME STATIONS

3

MAJOR RIVERS COVERED

4

CORE PARTNER ORGANIZATIONS

9

PARAMETERS TRACKED

6M+

DC METRO RESIDENTS SERVED

“ This project proves what’s possible when solution providers, watershed advocates, and technology teams pool their strengths around a single community goal. Each group bringing their expertise to the table allowed us to build a public-facing platform that makes water quality data easy for community members to understand. The result is a model program we believe can be replicated across urban watersheds nationwide.

— Nicole Horvath, Program Manager, The Reservoir Center

OVERVIEW

Working in partnership with Xylem’s Reservoir Center for Water Solutions, Anacostia Riverkeeper, Anacostia Watershed Society, and Potomac Riverkeeper Network, The Commons developed a comprehensive real-time water quality data management and visualization platform for the Anacostia, Potomac, and Shenandoah rivers. The Reservoir Center contributed the YSI EXO sonde hardware, on-site training, and grant funding to support costs associated with calibrating and maintaining the equipment, eliminating the largest cost barrier to sustained continuous monitoring. The platform ingests continuous sensor telemetry from nine YSI EXO sondes, processes it through a cloud-based pipeline with QARTOD-compliant validation, and delivers the results through an intuitive, mobile-responsive public dashboard — empowering recreational users, researchers, educators, and policymakers across the DC metropolitan region with the same trustworthy, real-time information.

STRATEGIC ALIGNMENT: WHERE CONTINUOUS MONITORING LANDS

By pairing sensor placement with on-the-water expertise from local Riverkeeper organizations, the partnership concentrated continuous monitoring in the urban watersheds most in need of real-time public data — including the Anacostia, historically among the most polluted urban rivers in the United States.

Anacostia · 5

Potomac · 3

Shenandoah · 1

Environmental justice priority

Urban recreation corridor

Upstream context

Closing the data gap: The DC Rivers platform answers a question regulatory monitoring alone cannot — is the river safe *today*, at *this location*? With continuous 15-minute sensor coverage and a permanent public archive, the answer is now available to anyone with a phone.

CONTINUOUS MONITORING AT SCALE

2.84M+

MEASUREMENTS / YEAR

Across all stations and parameters at 15-minute intervals

8,760

HOURS / YEAR

Of 24/7/365 continuous water quality coverage

∞

PERMANENT ARCHIVE

Replacing HydroSphere’s two-year retention ceiling

PROJECT IMPACTS

- ▶ First public-facing real-time water quality dashboard unifying the Anacostia, Potomac, and Shenandoah rivers
- ▶ Multi-year hardware and maintenance commitment from Xylem eliminates the largest cost barrier to sustained monitoring
- ▶ QARTOD-compliant validation ensures every public reading is scientifically defensible
- ▶ Replicable four-way partnership model for urban watersheds nationwide

PLATFORMS & TOOLS

MongoDB Atlas

DATA ARCHIVAL

Supports the data structuring and validation needed to attain long-term hosting and archival across the complete operational lifecycle of the EXO sonde.

Webflow

PUBLIC INTERFACE

Powers the mobile-responsive front-end and content management system that allows Xylem, Reservoir Center, and watershed partner staff to publish educational explainers and updates directly to recreational, research, and policy audiences.

Mapbox

SPATIAL VISUALIZATION

Renders the interactive map at the heart of the platform, surfacing real-time station status across all three rivers with color-coded parameter indicators that translate continuous telemetry into immediate, location-aware decisions.

MONITORED PARAMETERS

- ▶ Dissolved oxygen & % saturation
- ▶ pH, conductivity & turbidity
- ▶ Chlorophyll & blue-green algae pigment
- ▶ Fluorescent dissolved organic matter (fDOM)
- ▶ E. coli proxy, chloride & water temperature