# AquaWatch Smart Water Integrated Management System (SWIMS)

## Catchment Case Study
*Water Management, Simplified*

## OVERVIEW

Water quality improvements can seem slow. However, engaging with catchment groups and citizen scientists can rapidly expand monitoring coverage, accelerate data collection, and foster local stewardship.

## PROJECT

A regional water authority partnered with community catchment groups to establish a multi-point water quality monitoring network using continuous sensing technology. The goal was to improve regulatory oversight, increase local engagement, and enable immediate intervention when water quality thresholds were exceeded.

By integrating sensor-based data collection with community-led maintenance and oversight, the project reduced delays in identifying pollution sources and provided high-resolution data for regulatory decision-making.

## METHODOLOGY

**Collaborative Site Selection:** Key monitoring locations were determined based on land use pressures and ecological significance.

**Community-Led Monitoring:** Citizen scientists deployed and maintained AquaWatch real-time sensors, reducing operational costs.

**Monitored Parameters:**
- Dissolved Oxygen (DO), Turbidity, pH, Temperature, Conductivity, Rainfall and flow.

**Analysis Approach:**
- Assessing Spatial Trends: Identifying pollutant sources and variations across sites.
- Evaluating Seasonal & Event-Driven Variations: Understanding how rainfall and land-use changes influence water quality.
- Identifying Critical Pollution Drivers: Linking changes in parameters to specific land-use practices and environmental conditions.



## KEY RESULTS

- Faster Response to Pollution Events: Detection of a turbidity surge within hours of a heavy rainfall event.
- Enhanced Identification of Industrial Discharges: Real-time conductivity spikes flagged an illicit wastewater discharge which was easy to remediate.
- Improved Stormwater Management Strategies: Rainfall-driven spikes in sediment and conductivity identified high-risk urban runoff zones.
- Cost Savings Through Community Involvement: Routine maintenance of monitoring sites by trained volunteers reduced operational costs by 40% compared to traditional monitoring programs.

## RECOMMENDATIONS

- Deployment of sediment retention barriers to reduce further erosion.
- Prompt site inspection, regulatory intervention, and enforcement measures to halt pollution.
- Implementation of permeable pavement, wetland buffers, and enhanced stormwater filtration systems to mitigate runoff impact.
- Formalised community stewardship agreements to maintain long-term monitoring capacity.

## CONCLUSION

**Long-Term Environmental and Economic Benefits:**

Investing in the right nature-based solutions, such as constructed wetlands, sediment traps, and floodplain reconnection projects, enhances water quality and biodiversity while mitigating human impact.

**Scalable Approach for Regulatory Compliance:**

Standardised protocols for citizen science ensure reliable data for regulatory use, expanding monitoring without extra resource burdens. Grants and technical support sustain engagement and high-quality data collection.

**Technology-Driven Partnerships Improve Response & Decision-Making**

AI-powered analytics and real-time GIS integration allow regulatory agencies to prioritise intervention areas, streamline response times, and allocate resources efficiently. By combining citizen-led monitoring with advanced data processing, authorities can rapidly detect pollution trends, predict emerging risks, and optimise restoration strategies with greater precision.