WATER DATA COLLABORATIVE

STRATEGIC PLAN: 2021-2024

"WATER IS THE DRIVING FORCE OF ALL NATURE." — LEONARDO DA VINCI

The Water Data (WDC) Collaborative was formed in 2017 by seven charter organizations: The Consortium of Universities for the Advancement of Hydrologic Science, Inc. (CUAHSI), Chesapeake Conservancy, Internet of Water (IoW), Izaak Walton League of America, The Commons, River Network, and Waterkeeper Alliance. Together, these organizations represent a diverse nationwide landscape of community scientists and technical experts. We support a shared vision and mission, where the WDC's collective work can impact how data is collected, published, and utilized.

Our Mission: The Water Data Collaborative seeks to grow and maintain an inclusive community of trained and qualified community water scientists who employ best available practices and technologies to provide data that enable the protection and restoration of our nation's waterways.

Our Vision: Credible water quality data collected by community scientists are published, used to inform decisions, and guide actions to ensure our waters remain - or become - healthy, clean, and abundant for use by all communities and ecosystems.

The Problem

The health of our communities relies fully on the health of our waterways. Lakes, rivers, estuaries, oceans, and more provide drinking water, economic opportunities through recreation and fisheries, and quality of life for humans and wildlife. However, the health of our waterways is continually at risk due to climate change, pollution from cities and agriculture, industrial waste, and overuse of the resources on which the entire globe depends.

While water quality data is being collected across the country, only a small portion is currently interconnected in a way that easily allows us to comprehensively assess the health of our waterways. Using rivers and streams as an example, only 31.4% of the 3.5 million stream miles are assessed by state and federal partners.[1] Despite almost 50 years of monitoring enabled by the Clean Water Act, almost 70% remain "unassessed." In short, this means the health of many streams and rivers is simply unknown, and state and federal governments do not have the resources to fill that data gap. With water quality information still unknown, problems remain undiagnosed, affecting the health of our environment and communities. In addition, low-income and minority communities often face disproportionately high pollutant exposures.[2]

Local watershed organizations throughout the nation are a significant untapped resource, collecting water quality monitoring data that detail how our actions on the land affect the nation's waterways. Samples taken by the extensive network of volunteers (or "community scientists") equate to countless hours of donated time and a real-time pulse on local water quality health, information that otherwise would not exist. Unfortunately, many of these groups tirelessly gather that data, only to have it sit in a spreadsheet on a single computer, or worse, on paper in a file cabinet. These data sources, as a result, are not connected to our increasingly connected world, and the public, states, and federal government do not have access to this valuable data. That is where the Water Data Collaborative comes in.

1. United States Environmental Protection Agency. (2016). National Summary of State Information: Summary of Water Quality Assessments for Each Waterbody Type. EPA ATTAINS Database. Retrieved from: https://ofmpub.epa.gov/waters10/attains_nation_cy.control#STREAM/CREEK/RIVER
2. https://ehjournal.biomedcentral.com/articles/10.1186/s12940-018-0442-6
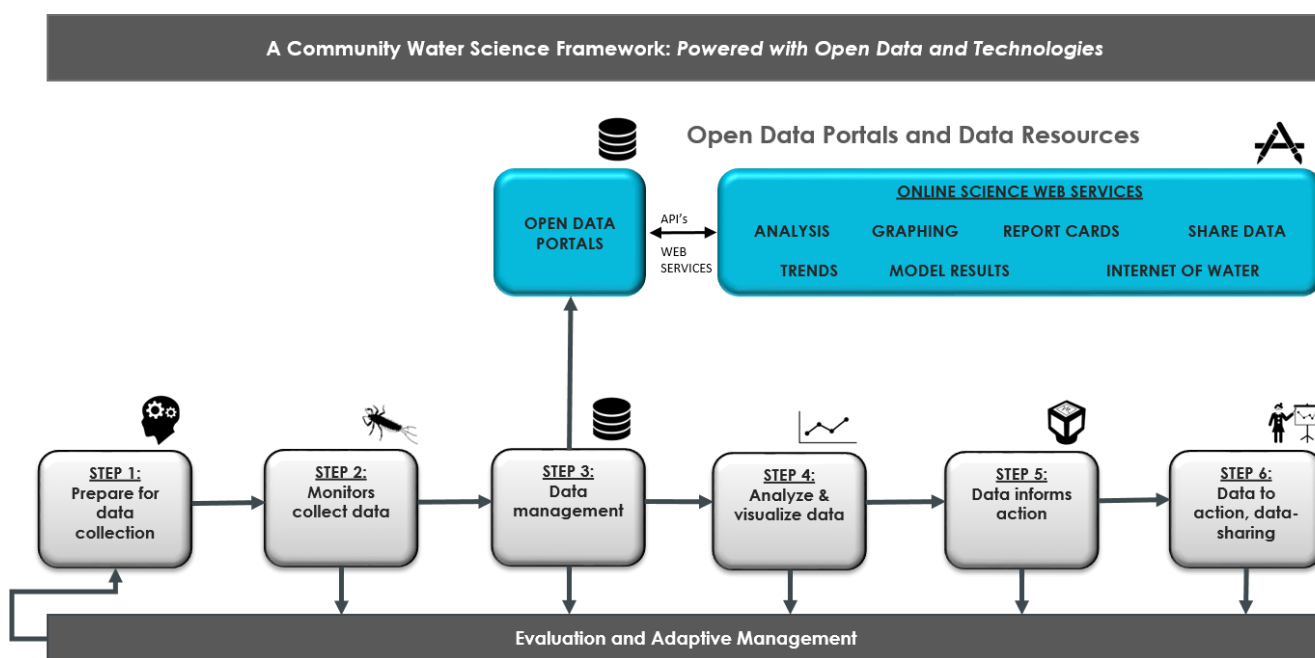
The Solution: The Water Data Collaborative

Bringing community water science under one umbrella of understanding and implementation

Community scientists are striving to deliver vital information on local water quality conditions that is both credible and available to all levels of decision-makers to encourage measurable actions that protect and restore our nation's waterways. The Water Data Collaborative unlocks the power of an entire network of innovative community efforts, by offering an unprecedented opportunity to elevate community science, through unity and standardized processes.

Community Science:

As part of the Water Data Collaborative's commitment to justice, equity, diversity, and inclusiveness, we are replacing the use of the terms 'citizen science' and 'volunteer monitoring' with 'community science.'

The projects of the Water Data Collaborative utilize a conceptual model -- the Community Water Science Framework ("Framework") -- allowing us to organize programs, technologies, and resources in support of watershed science. The Framework promotes an iterative process that includes seven steps: 1) study design, 2) sample collection and analyses, 3) data storage and organization, 4) data analysis and visualization, 5) modeling and planning, 6) informed action from findings, and 7) evaluation and adaptive management. The Water Data Collaborative aims to increase the quality and documentation of water monitoring practices to ensure data and findings will support decision makers, and other data users. We will do this by providing trainings, tools, and support, focused on best practices for community science.

A Community Water Science Framework: *Powered with Open Data and Technologies*

The resources delivered via the Water Data Collaborative will:

- Increase access to, and the discoverability and potential impact of, water quality data
- Share vetted resources, knowledge, and tools and provide previously unavailable resources to community scientists involved in water quality monitoring
- Elevate the quality, transparency, and trustworthiness of data-driven decision processes
- Highlight local efforts that can be replicated and expanded throughout the country
- Create a branded, recognizable, and industry-accepted set of best practices
- Provide a common lexicon or language to communicate, document, and measure these community science efforts to aid in credibility, wider acceptance and expanded use
- Raise the credibility, transparency, role, and status of community science through best practices, training, and certification in all areas of the Framework
- Minimize unnecessary duplication of data collection efforts
- Help funders identify and elevate programs of a known caliber

Water Quality:

For the WDC, water quality means chemical, biological, and physical habitat features, and attributes that collectively facilitate a water ecosystem's ability to function and provide services. When one vector is impaired, it impacts the others. When all vectors are functioning, the intersection represents maximum system resiliency, diversity and health.

Our Commitment to
Diversity, Equity, Inclusion and Justice (DEIJ)

The Water Data Collaborative honors diversity, equity inclusion, and justice principles that are intrinsic to our mission and critical to ensure the well-being and sustainability of the WDC. We recognize systemic racism has created barriers to entry for those who would like to be a part of the community science monitoring community, and for those who could benefit from community science monitoring. We also acknowledge that unhealthy water conditions disproportionately affect poor and communities of color. Whenever possible, WDC will:

- Acknowledge and dismantle any inequities within our policies, systems, programs, and services, and continually update and report organization progress.
- Pool resources and expand offerings for underrepresented constituents
- Be intentional about practicing and encouraging transparent communication for more equitable inter-Collaborative and partnership culture. As a new Collaborative, we will seek out opportunities to support other organizations in this work, and commit to internal growth, learning, and thoughtful implementation in our own organization in areas of DEIJ.

Our work towards achieving our four goals will only be successful when we fully integrate diversity, equity, inclusion, and justice into our structure, processes, and projects. The Water Data Collaborative will weave these values throughout all goals and objectives.

Puget Soundkeeper

Waterkeeper Alliance

Our Future: Goals, Objectives, and Outcomes

The Water Data Collaborative will achieve its mission by focusing on activities related to our four goals:

Goal 1: Technology, Training, & Resources
Deliver a valued, credible, and accessible community science online training program, and related resources, to leverage knowledge and recognize best practices as verified by users, agencies, and funders.

Goal 2: Data Services and Support
Support community scientists at all levels, providing services and expertise to ensure that all community science data follow FAIR data principles --which are findable, accessible, interoperable, and reusable -- in concert with the IoW.

Goal 3: Engagement and Community Development
Build, strengthen, and promote our network to ensure we continually evolve to represent the needs and challenges faced by the diversity of community scientists with whom we work.

Goal 4: Long-term Sustainability & Leadership
Ensure the viability of WDC through appropriate policies, leadership, and sustained funding achieved through collaborative efforts.

GOAL 1:
TECHNOLOGY, TRAINING, & RESOURCES

Deliver a valued, credible, and accessible community science online training program and related resources to leverage knowledge and recognize best practices as verified by users, agencies, and funders.

Objective 1.1: Emerge as the leading entity for all community monitoring programs seeking to institutionalize a standard process to leverage their data for promotion of efforts locally, and improvements to water quality nationally.

Objective 1.2: Provide access to resources, software, case-studies, service-providers, and mentors via the Online Resource Library and Service Provider Directory.

Objective 1.3: Produce, promote, deliver, and evaluate interactive and engaging online modular trainings for all steps of the Framework.

Objective 1.4: Produce a series of webinars and resources to enhance skill sets and best management practices of community water scientists across our networks.

Goal 1 Outcomes: Technology, Training, & Resources
By 2024, WDC will have achieved the following:

- **Seal of Approval -** WDC is recognized and endorsed by state and federal agencies, funders, key non-governmental organizations (NGOs), and the IoW as a leading provider of training, technical resources, and certification for community monitoring science programs in the U.S. via the following:
    - A vetting process from key cohort groups to test on-line trainings and products, and provide case studies and testimonials.
    - Training of community scientists to effectively use approved standards for activities along the Framework.
    - Certifications of completion are available via an online learning platform, where progress can be tracked.
    - Creation and promotion of a verification process to ensure service providers in the Online Resource Library and Service Provider Directory embrace and utilize best practices.
    - Documentation from state and federal agencies regarding approach, content, and best management practices recommended in the Framework.
- **Online Resource Library and Service Provider Directory -** The Online Resource Library and Service Provider Directory is regularly updated, providing up-to-date and high-quality trainings, resources, and referrals for each of the Framework's steps to the growing movement of community scientists.

GOAL 2:
DATA SERVICES AND SUPPORT

Support community scientists at all levels, providing services and expertise to ensure that all community science data follow FAIR data principles --which are findable, accessible, interoperable, and reusable -- in concert with the IoW.

Objective 2.1: Support and implement modern best practices for applying FAIR data principles in WDC projects, making data more discoverable and easily leveraged via the IoW.

Objective 2.2: Share and administer services that simplify data management, visualization, and analysis for community water scientists utilizing WDC accepted platforms, such as Clean Water Hub and Water Reporter. Identify, implement, and deploy the necessary processes that allow water quality monitoring programs to structure and publish their data to open water data repositories like the Water Quality Exchange (WQX), the Water Data Exchange (WaDE), CUAHSI, and other third party metadata catalogues in the IoW network.

Objective 2.3: Provide community science programs with access to direct assistance from industry leaders familiar with the Framework and recommended best practices for data collection preparation, data collection, storage and management, analysis and visualization, data informing action, and data to action.

Objective 2.4: Demonstrate the ability for successful regional data sharing models to scale through additional integrations and pilot efforts.

Goal 2 Outcomes: Data Services and Support
By 2024, WDC will have achieved the following:

- **Data Consolidation and Management -** Clean Water Hub and Water Reporter are integrated and developed to become a widely recognized community science hub and an official hub of the IoW, delivering data to the national Water Quality Portal (WQP).
- **Meaningful Nonprofit Support Services -** Individuals and organizations utilizing WDC resources demonstrate how WDC elevates their organization, allowing them to engage and grow their volunteer base, generate additional grant revenue for their monitoring programs, and catalyze policy change by valuing and leveraging machine readable data.
- **Expanded Use of Integrated Datasets to Inform Policy -** Community scientists are empowered to visualize and utilize monitoring data to improve and advocate for local water quality.
- **Technical Matchmaking -** Community scientists and small watershed monitoring programs are matched and working with technical service providers, resulting in increased efficiency and project success.

GOAL 3:
ENGAGEMENT AND COMMUNITY DEVELOPMENT

Build, strengthen and promote our network to ensure we continually evolve to represent the needs and challenges faced by the diversity of community scientists with whom we work.

Objective 3.1: Ensure inclusive representation, involvement, and input from key stakeholders who generate and consume data, make decisions, and take actions for our waterways.

Objective 3.2: Leverage and build upon existing networks to reach community scientists, relevant agencies, and data users.

Objective 3.3: Demonstrate the value of water data collected by community science NGOs and facilitate integration of these data into public decision making by producing and sharing case studies that combine NGO and public data.

Objective 3.4: Implement a long-term strategy to coordinate with the IoW and educate decisionmakers about the value of community science data.

Objective 3.5: Integrate an online community into our website, highlighting programs, sharing knowledge, and engaging peers and experts to advance individual and collective effectiveness and impact.

Goal 3 Outcomes: Engagement & Community Development
By 2024, WDC will have achieved the following:

- **Network growth -** Expanded participation in the WDC network enhances credibility and utilization of tools that integrate community science into decision-making.
- **Network Engagement -** Cross promotion across all community science networks, and coordination with state or federal partners leads to frequent market exposure of our resources and services.
- **Awareness and promotion -** Community scientists are introduced to - and use - the benefits of our programs, services and online community.
- **Community of Practice -** A nationwide Community of Practice connects water scientists, programs, and data users who share resources via an interactive online community and help spread adoption and uptake of best recommended technologies and monitoring practices.

GOAL 4:
LONG-TERM SUSTAINABILITY & LEADERSHIP

Ensure the viability of WDC through appropriate policies, leadership, and sustained funding achieved through collaborative efforts.

Objective 4.1: The Water Data Collaborative has the necessary funding and resources to support all programs and related activities.

Objective 4.2: The Water Data Collaborative is successfully led by inclusive and representative leadership, and guided by policies and structure that foster justice and equity.

Goal 4 Outcomes: Long-term Sustainability & Leadership
By 2024, WDC will have achieved the following:

- **Staffing -** A dedicated staff and inclusive Steering Committee represents and supports the diversity of community science programs and monitoring expertise.
- **Sustainable funding-** A robust multi-year budget and fundraising plan generates a diverse revenue stream from agencies, foundations, individuals, corporations, and fee-for-service.
- **Organizational Maturity & Growth -** WDC successfully operates under a fiscal sponsor with the necessary capacity to move the needle on strategic objectives while assessing costs and benefits of expansion to a stand-alone nonprofit entity.

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For more information: *www.waterdatacollaborative.org*