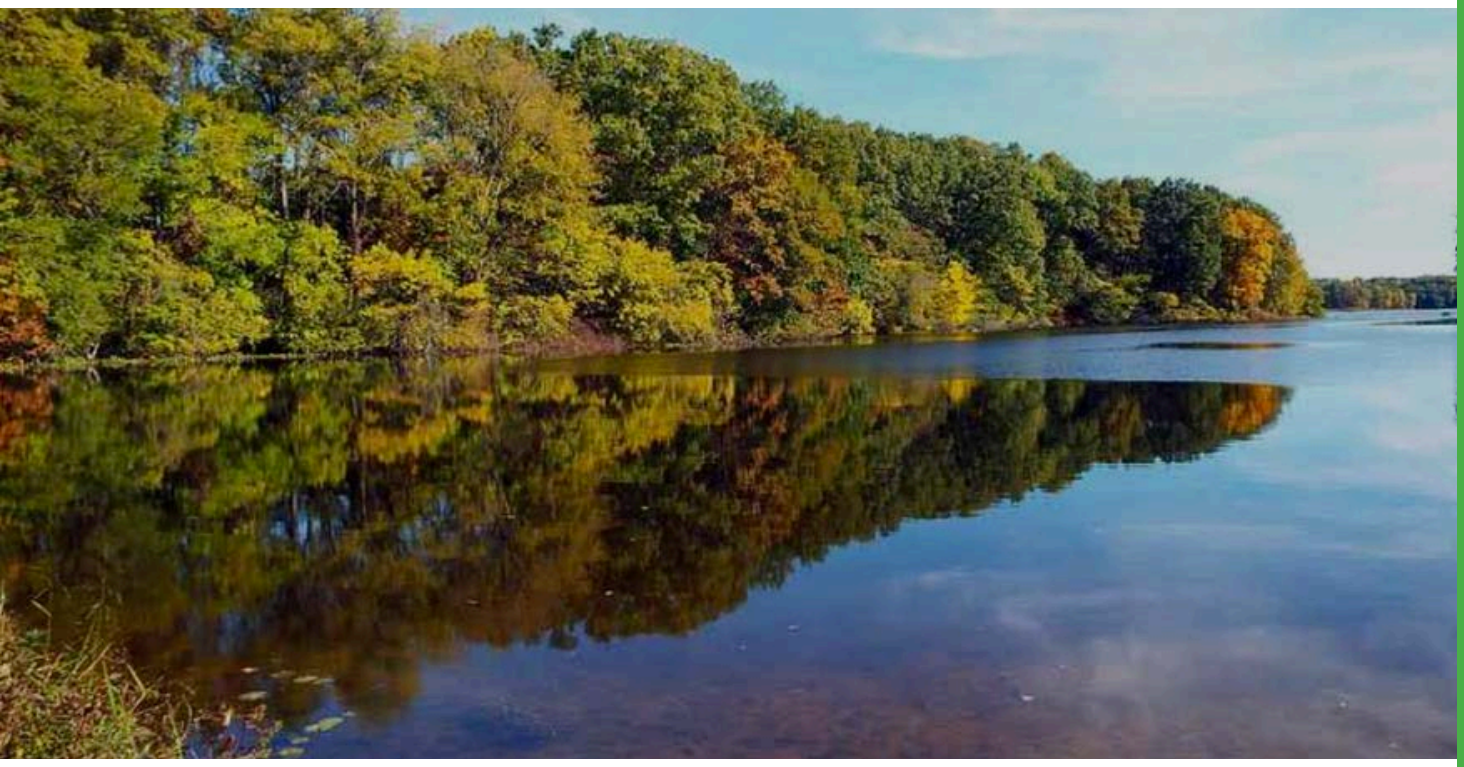
FEBRUARY 2025

Final Report

MBDH/Sense SB Water Quality Project



Presented by
Caroline Corona
Sammy Rothman

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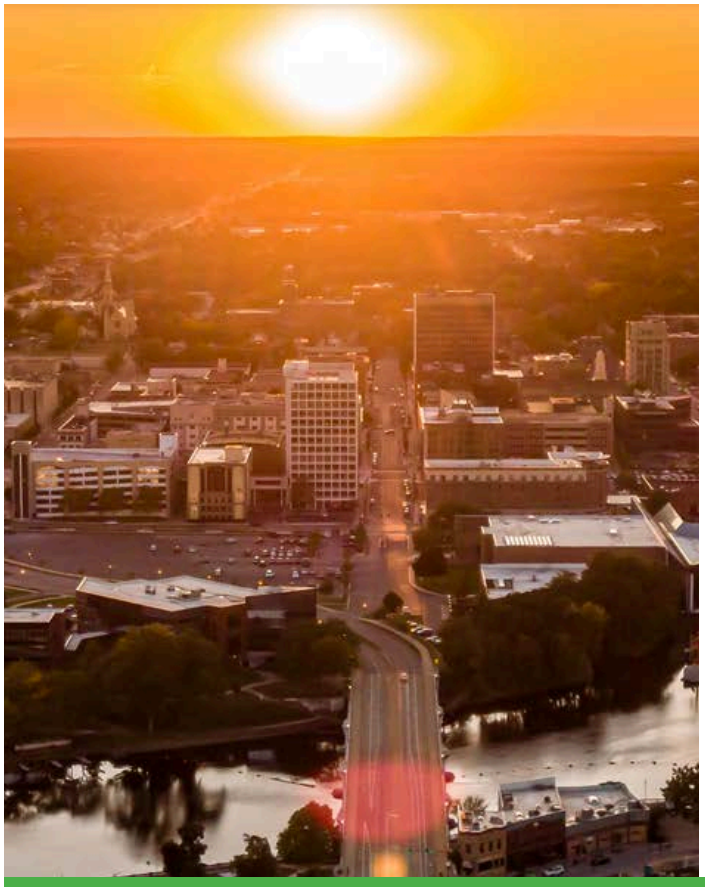
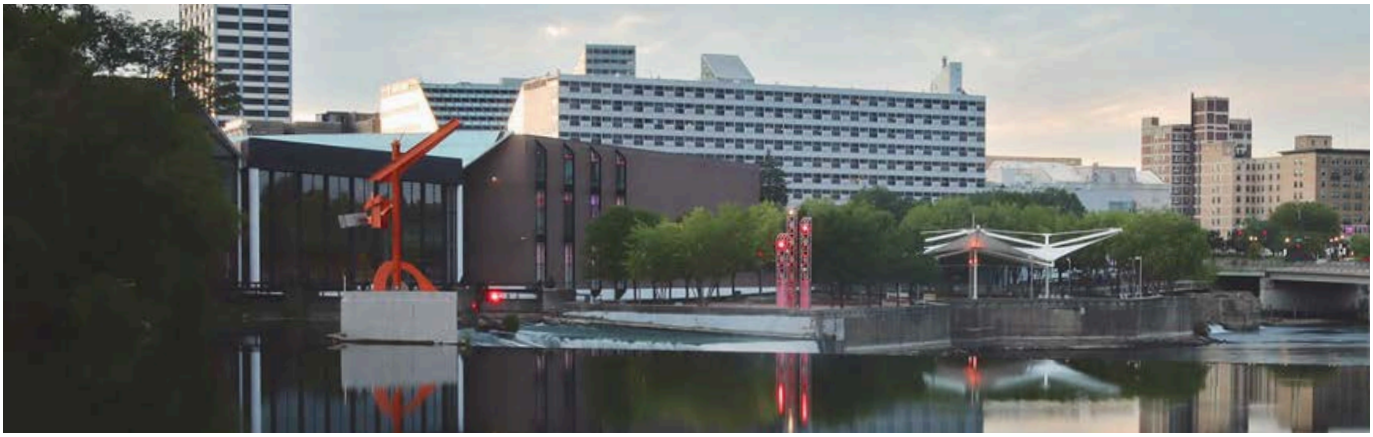


Introduction

Over the past decades, water quality in South Bend and the broader St. Joseph watershed has improved significantly. However, public perception of the quality of water has not kept up with these advancements. As a result, many residents are unaware of the current state of the water. By effectively communicating water quality data, we can ensure continued environmental stewardship.

This proposal leverages historical data and stakeholder insights to bridge the gap between scientific data and public understanding. Communication tools, such as an interactive web dashboard, a water quality report card, and an arts-based community engagement, are explored. The goal of these communication strategies is to make water quality information more accessible and engaging for residents, ultimately strengthening community awareness and involvement.



Scott Palmer

Background

The St. Joseph River was essential to South Bend's growth in the late 19th century, serving as a major trade route as the city's population expanded. Manufacturers took advantage of the river's energy, setting up businesses along its banks and relying on the water to sustain increasing industrial production.

However, with no wastewater treatment systems in place, unchecked industrial activity led to severe pollution. Factories and cities dumped waste directly into the river, causing significant environmental damage. By the end of World War II, the river's water quality had sharply declined, and wildlife populations had fallen.

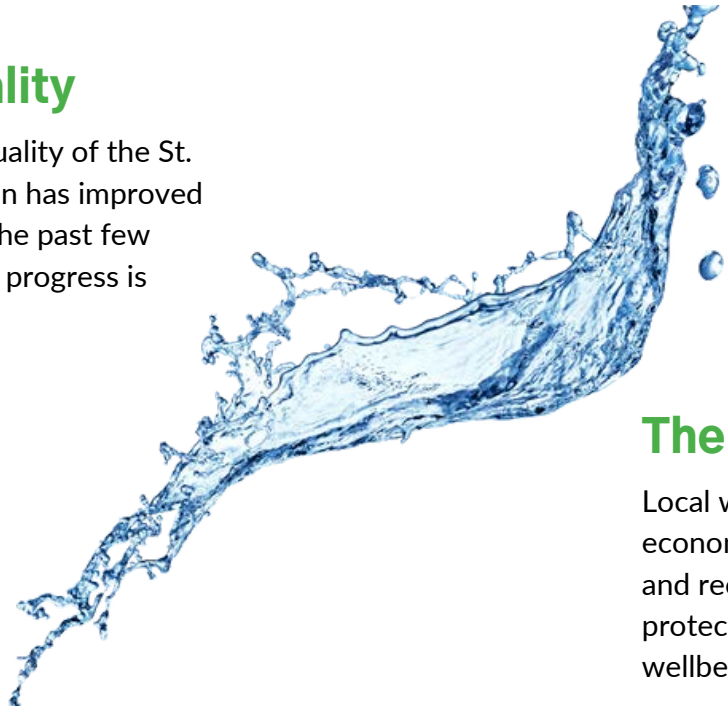
Once considered a "dead" river, extensive restoration and clean up efforts have led to significant improvements in the quality of the water, allowing South Bend residents to enjoy clean, healthy water.

https://www.pbs.org/video/then-now-and-always-the-st-joseph-river-story-mdudna/
https://www.wndu.com/2024/06/04/group-notes-steady-improvement-quality-st-joseph-river/https://www.historymuseumsb.org/research-history/business-history/IONS

Key Themes & Messages

Water Quality

The health and quality of the St. Joseph River Basin has improved immensely over the past few decades, but that progress is fragile



The Value of Water

Local waterways provide for our economic, agricultural, residential, and recreational needs, and protecting them is essential to our wellbeing

Through water quality research conducted by the City of South Bend, the St. Joseph River Basin Commission, and additional stakeholder conversations, a few key themes emerged. First, the health and quality of the St. Joseph River Basin has improved immensely over the past few decades, despite a public perception otherwise. Indeed, the water today is remarkably clean overall and usually safe for outdoor recreation (swimming, fishing, etc.). However, it is also important to communicate that this progress is fragile, and that risks like combined sewage overflows can threaten the health and quality of local waterways. Despite water testing showing that the water is generally clean and safe, these risks can change that status quickly, meaning that the water must be continuously monitored and that residents should be aware of when and how changes could affect water use. Helping the public understand the key measures of water quality and what they mean is essential to promoting safe use of the region's waterways and to spur action on maintaining clean water for all.

The other key theme that emerged from stakeholder conversations in particular is the value of water and communicating why the health and quality of local waterways matters to South Bend and the broader St. Joseph River Basin community. Local waterways are essential to our wellbeing: they provide for our economic, agricultural, residential, and recreational needs. The watershed provides drinking water for the region's 1.5 million residents and supplies water to support the agricultural industry, which makes up approximately 70% of the region's land use. Residents and visitors embrace the natural beauty of the watershed by hiking, biking, canoeing, and fishing through the area's forests and streams. Our economy and wellbeing rely on this water being clean, safe, and healthy; and communicating that value became one of the key goals of this proposal.

Communication Proposals

The key themes inspired four proposals for communicating information about the health of the St. Joseph River Basin and encouraging people to connect to the local watershed. These have the potential to provide education on complex water quality topics and motivate action to keep local waterways clean.

Interactive Web Dashboard

An interactive web page that is regularly updated highlighting key metrics and information on water quality.

Report Card

An easily digestible graphic that shows how the watershed performs on key metrics, assigning an overall score or grade

Timeline

A visual or interactive timeline highlighting the history of the St. Joseph Watershed

Arts Engagement

A collection of local artistic reflections on the value of the area's waterways

https://spushipcanal.participate.online/art

Interactive Web Dashboard

An interactive web page that is regularly updated highlighting key metrics and information on water quality

A regularly updated dashboard would give South Bend residents real-time access to water quality data in an understandable format. This tool would provide an easily identifiable overview of the condition of the waterbody based on the most recent data.

Data from water sensors placed throughout South Bend's waterways could be used to track pollutants, bacteria levels, and temperature, and then relay this information in real-time to the dashboard. Color-coded indicators could provide a quick visual reference, with green indicating good water quality, yellow indicating moderate water quality conditions, and red indicating dangerous water quality conditions.

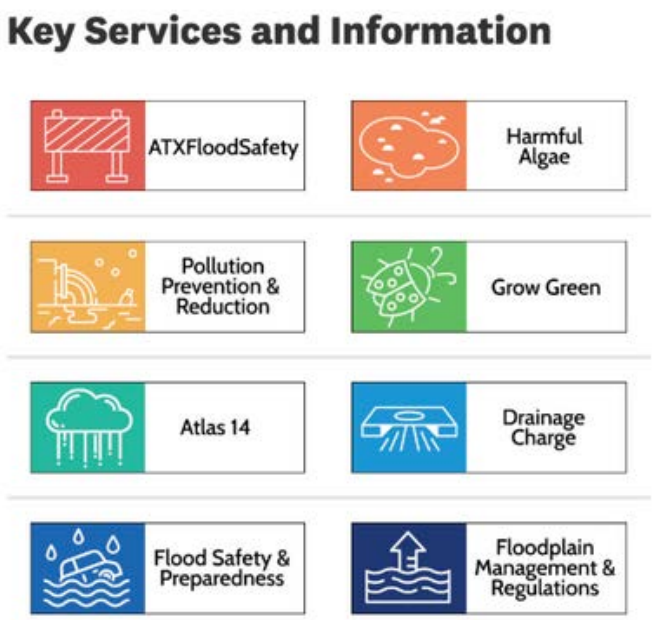
By updating in real-time, the dashboard can help residents stay informed about the health of their local waterways in an intuitive way, allowing them to easily assess conditions and make informed decisions.

Resources Needed

In order to support a live dashboard, essential resources like water sensors and a dedicated web platform would be required. Additionally, the following elements would support the development of an interactive web dashboard:

- Data Collection and Integration
- Dedicated Website or Platform
- Data Visualization Tools
- User Interface and Design Expertise
- Technical Maintenance and Updates
- Community Outreach/Media Communication

Case Study



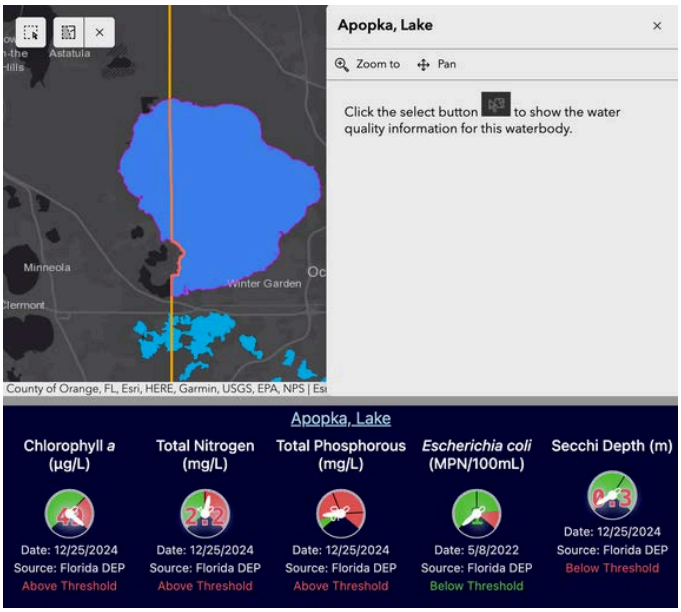
City of Austin

The City of Austin provides access to its water quality data through an Open Data Portal. Through this service, residents can access datasets related to water quality, including real-time monitoring data, historical trends, and assessments of local watersheds.

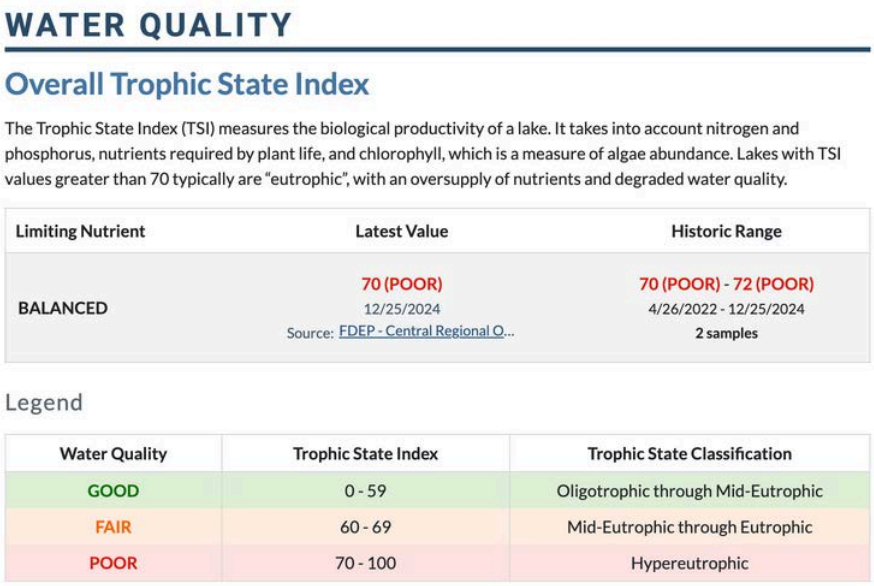
Orange County Water Atlas

The Orange County Water Atlas was developed to help the general public understand Florida's water resources.

Each waterbody is separately coded, allowing users to easily locate and explore specific areas. From there, they can access comprehensive data, including water sample analyses, images, and an extensive data index explaining the different contaminants and their potential impacts.



https://www.austintexas.gov/department/watershed-protection
https://orange.wateratlas.usf.edu/



WATER QUALITY

Overall Trophic State Index

The Trophic State Index (TSI) measures the biological productivity of a lake. It takes into account nitrogen and phosphorus, nutrients required by plant life, and chlorophyll, which is a measure of algae abundance. Lakes with TSI values greater than 70 typically are "eutrophic", with an oversupply of nutrients and degraded water quality.

Limiting Nutrient	Latest Value	Historic Range
BALANCED	70 (POOR) 12/25/2024 Source: FDEP - Central Regional O...	70 (POOR) - 72 (POOR) 4/26/2022 - 12/25/2024 2 samples

Legend

Water Quality	Trophic State Index	Trophic State Classification
GOOD	0 - 59	Oligotrophic through Mid-Eutrophic
FAIR	60 - 69	Mid-Eutrophic through Eutrophic
POOR	70 - 100	Hypereutrophic

Orange County Water Atlas

Additionally, the Orange County Water Atlas provides a color-coded legend depicting "Good", "Fair", and "Poor" water quality levels. It also displays the most recent water quality values alongside their historical range, allowing users to track changes over time.

Report Card

An easily digestible graphic that shows how to watershed performs on key metrics, assigning an overall score or grade

There are many metrics used to measure water quality, which can be difficult for non-experts to navigate. These indicators use different units, have different ranges of possible values, and rely on different thresholds to assess health and quality. Chlorides, which indicate the level of salts in the water, are measured in milligrams per liter (mg/L), and levels above 250 mg/L pose risks to human health. Nitrates, which lead to eutrophication and harmful algae blooms, are also measured in mg/L, but the EPA considers levels above 10 mg/L to be excessive. Bacteria like E. Coli is generally measured in Colony Forming Units (CFU) per 100 mL, and other metrics introduce additional units of measurement. Someone with little background or experience would likely have a difficult time comprehending whether a particular indicator value is good or bad and what it means. This can make public water quality reports difficult to digest for non-scientific audience, yet residents and visitors may rely on this data to make informed decisions regarding water recreation and use.

Converting these measures to a more standard rating system through a report card can improve public dissemination and understanding. Letter grades are a useful heuristic that are widely understood, as we are taught the A-F grading scale from a very young age. Assigning indicators like nitrates, chlorides, bacteria levels, etc. with a letter grade can allow users to easily see which dimensions of water quality the area's waterways are performing well in and which need improvement. A single summative grade for the water system overall can give users a quick answer to the question: how clean, healthy, and safe is the water?

This report card should be published on a regular basis (i.e. annually or semi-annually) to show how the water system is progressing. Each report card release would present additional opportunities to highlight progress made and call attention to areas for improvement. It could also be used to educate people on what the different water quality indicators mean and why they're important.

Resources Needed

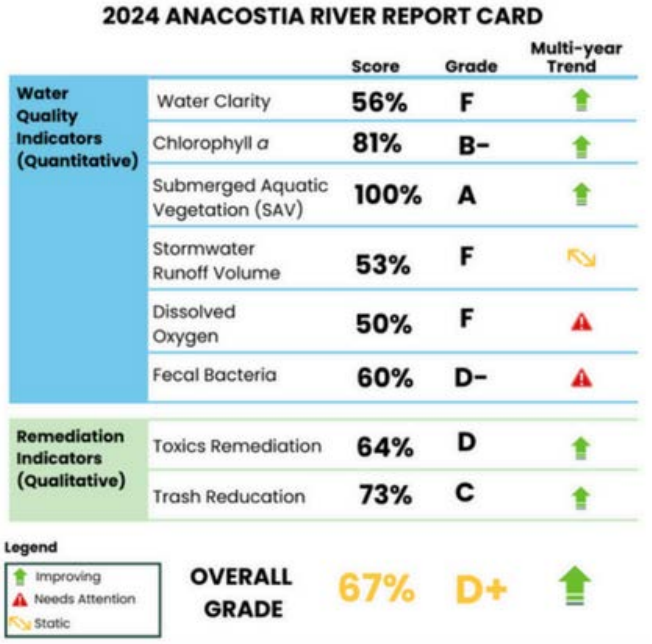
The report card could be made available online and further disseminated on social media, printed on handouts or flyers, and shared with news outlets. To do so, the following resources would be needed:

- Data Collection and Translation
- Dedicated Website or Platform
- Printouts
- Press Communications

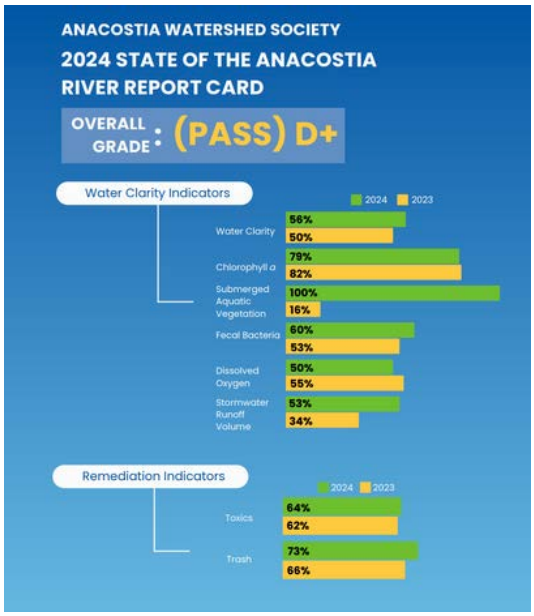
Case Study

The Anacostia Rivershed Society in Washington, DC publishes an annual report, titled "State of the Anacostia River" that includes a report card with an overall water quality grade (A-F) as well as numeric and letter grades for a set of environmental metrics. The annual report has been used to rally people around the region's goal of making the Anacostia River swimmable and fishable by 2030 and regularly garners local media attention (see DCist, WTOP, and NBC Washington).

The 2024 report includes several water quality indicators and each is assigned a percentage score, a corresponding letter grade, and an icon signaling the multi-year trend. This methodology is also used to create an overall summative grade, which provides a simple key message to share with the public and media outlets. The Anacostia Rivershed Society Report Card provides a model for communicating complex water quality metrics.



Anacostia Rivershed Society, 2024



Additional Examples & Other Resources

- Tampa Bay Estuary Report Card: Summarizes dense water quality records to communicate performance on management targets and regulatory thresholds
- Elkhorn Slough Water Quality Report Card: Provides an interactive web-based tool to explore water quality grades in different parts of the Elkhorn Slough watershed in Monterey, CA
- OpinionWorks Best Practices for Creating a Water Quality Report Card: Outlines a series of recommendations for designing and disseminating an environmental report card based on results from a readership study of tributary report cards
- Community Science Institute Water Quality Report Card Activity: An educational tool that guides kids through exploration of the aquatic life found in streams and what that indicates about the health and quality of the water

Timeline

A visual or interactive timeline highlighting the history of the St. Joseph River Basin

An interactive timeline showcasing major milestones in the history of the St. Joseph River Basin would highlight the extensive restoration work that has been completed while further illustrating the quality of the water. This tool would provide residents with an engaging way to understand the transformation of the watershed that has been achieved over the past decades from environmental work.

The timeline could include key historical events, such as the industrial era's impact on the watershed, the introduction of the Clean Water Act, and the introduction of projects aimed at reducing pollution and restoring habitats. Additional highlights, such as community-led initiatives, collaborations with environmental organizations, and measurable improvements in the water quality over the past decades would make the timeline more relevant and engaging for South Bend residents.

Before-and-after photos, stories or successful conservation efforts, and charts tracking historical pollution reductions could be included as interactive features of the timeline, allowing residents to learn more about the history of the watershed and the developments implemented to improve the water quality.

By highlighting the history of the watershed and the work that has gone into its recovery, the timeline could serve as a tool to help residents understand the progress that has been made and appreciate the importance of ongoing environment stewardship.

Resources Needed

To create an interactive timeline highlighting major milestones in the history of the St. Joseph River Basin, the following resources would be needed:

- Historical Records and Reports
- Legislation and Policy Documents
- Water Quality Data
- Technical and Digital Tools (to host the timeline)
- Content Development
- Outreach and Collaboration

Case Study

The San Francisco Baykeeper offers an interactive timeline highlighting its history of defending the San Francisco Bay. Serving as both an educational resource and advocacy tool, the timeline allows the public to explore key historical events that have shaped the sustainability of the Bay. By showcasing the extensive advocacy and restoration efforts in an interactive and engaging format, the timeline helps residents understand the impact of environmental policies and community action on water quality.

https://baykeeper.org/timeline/

Arts Engagement

A collection of local artistic reflections on the value of the area's waterways

Storytelling and qualitative modes of communicating are just as valuable as highlighting data. Local waterways serve important functions to the community, from supplying drinking water and supporting agriculture to providing ecosystem services that can help mitigate the effects of climate change. Local waterways also provide recreational opportunities like fishing, paddling, and hiking. All residents benefit from the health of the St. Joseph River Watershed, but these benefits can be difficult to quantify and communicate, leading some to underestimate its value.

Water plays a role in everyone's life, and turning to local residents to express how they experience the watershed and perceive its value can help build a dynamic and powerful messaging campaign on why the health and quality of local waterways is important. People could share written reflections, visual art pieces, and more to reflect on why the local system is important. This is a great way to get non-expert community members of all ages involved in water quality efforts and can lift up diverse voices and perspectives on the local water system. It also provides opportunities for residents to connect over shared experiences or concerns and helps build a community identity around the area's water assets.

Engagement with the arts could culminate in an online repository, contests, traveling art shows, or a permanent exhibit. Arts projects could complement existing community events or spur new events and programs. Local arts organizations, libraries, schools, and other community organizations could support recruitment and collection, while the St. Joseph River Basin Commission and other environmental organizations could incorporate educational components. Overall, art provides another way for residents to process information about water quality and helps to further build a sense of community.

Resources Needed

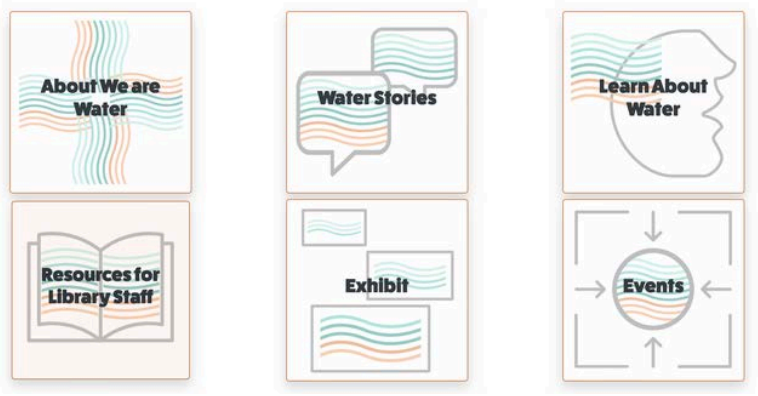
These reflections and art projects could be collected and disseminated online or in-person, and could inspire additional events or programs. To get started, the following resources would be needed:

- Advertising/recruitment materials (fliers, social media posts, organizational outreach)
- Arts organization partners
- Editorial services (i.e. selecting art for publication or display)
- Dedicated website or platform

Case Study

We are Water is a place-based educational, arts, and communications campaign in the 4-corners region of the Southwestern United States. Its mission is to share stories and inspire conversations about what water means to communities in the region, and it works with local community organizations and libraries. The We are Water website includes a series of video stories and a photo gallery that lift up community expressions on the value of water and inspire conservation action. The campaign also provides resources for organizations and educators to lead activities on water education and arts expression, including water testing, water bead bracelet making, conversation guides, and more.

The We are Water campaign also has a traveling exhibit that visits different libraries across the Four Corners region, providing an in-person space to learn, share, and talk about the value of water. The exhibit has four themes: water and life, water use and water rights, water in the landscape, and water in the community. Displays include educational information, stories, and community reflections, and each component of the exhibit features a hands-on activity or game as well. The exhibit and online resources provide a dynamic, engaging opportunity for community members to learn about and reflect on the area's water system.



Cooperative Institute for Research in Environmental Sciences, We are Water (2025)

Additional Examples & Other Resources

- Red Rock Stories: An online repository with two published books of writers reflections on the landscape and Utah, with a call to protect public lands
- Earth Art Chicago: Highlights important environmental issues impacting Chicago through locally made public art
- National Endowment for the Arts Enhancing Environmental Consciousness: A partnership between the EPA and the NEA that embeds artists in six national estuary or urban water sites to integrate arts and culture into key EPA program areas