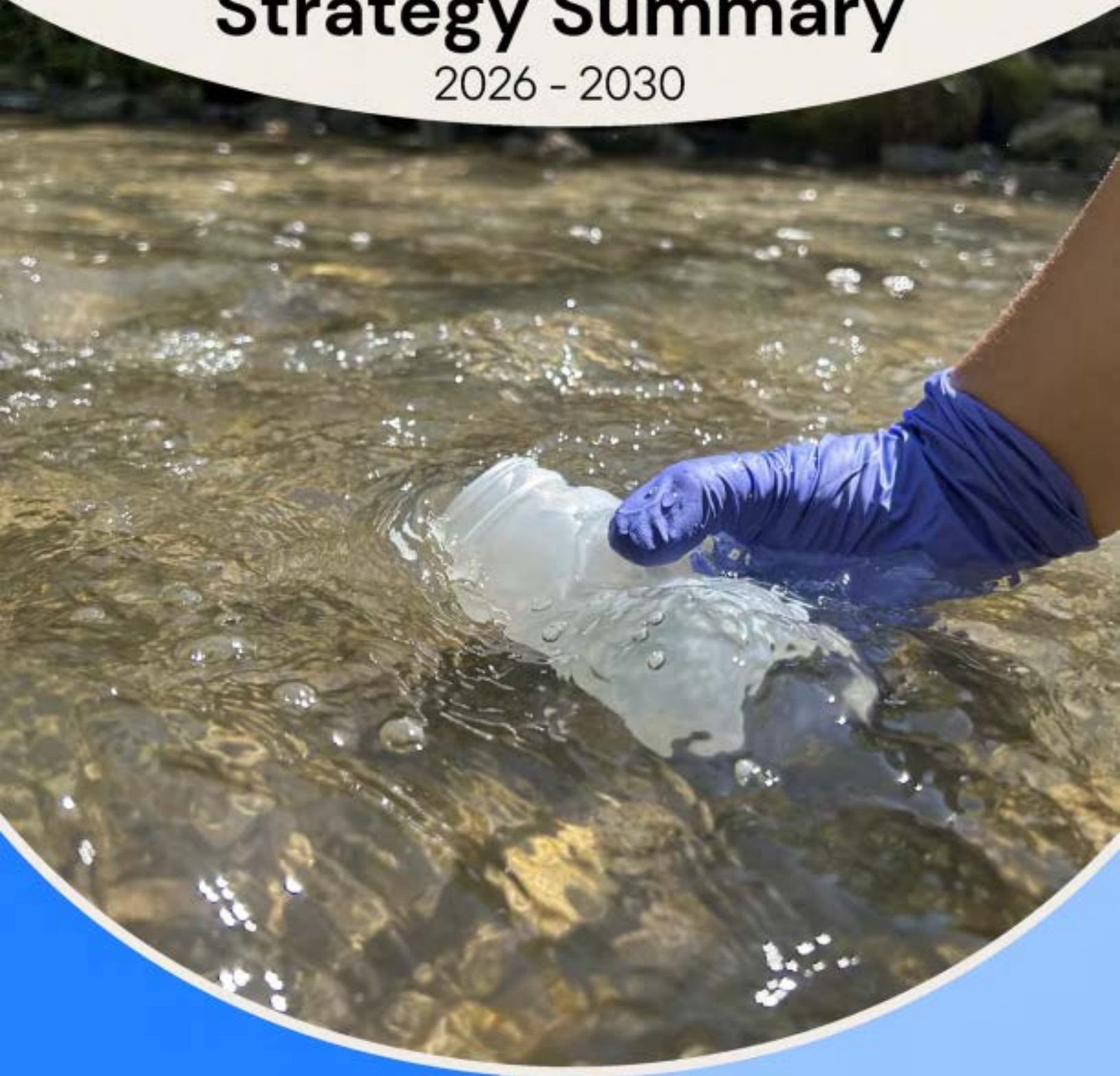


Watershed Monitoring Strategy Summary

2026 - 2030



AUSABLE BAYFIELD
CONSERVATION

CREATING AWARENESS | TAKING ACTION

Traditional Territory Acknowledgement

Ausable Bayfield Conservation Authority (ABCA) acknowledges the original stewards of this land, the Haudenosaunee and Anishinaabe.

We recognize the Huron Tract Treaty signed in 1827. We recognize that this territory was subject to the Dish with One Spoon wampum, under which multiple nations agreed to care for the land and resources including plants and animals, in peace.

As shared stewards of this land and water, the ABCA is grateful to have the opportunity to meet and work in this territory.

There are many indicators of environmental quality. Physical, chemical and biological systems are connected; but water is the ultimate tell-tale sign. It runs over and through the land, absorbing everything it touches which makes it a **cumulative indicator of the health of our watershed.**

Getting an accurate picture of our water requires **a team effort.** Field technicians collect the samples, while GIS specialists and data analysts turn raw data into information. We don't collect data for the sake of it; we use it to make **informed management decisions.**

This strategy outlines ABCA's monitoring programs and explains how we use long-term data to measure our progress and adapt our practices. There is also a recommended path forward with the community and more regional partners to **evaluate conservation efforts.**

TABLE OF CONTENTS

Monitoring Matters	2
Goals of Monitoring	3
Water Quantity	4
Water and Climate	6
Groundwater	7
Water Quality	8
Biomonitoring	10
Monitoring to Manage	12
Lands	13
Data into Information	14
The Importance of Scale	15
Community Interests	16
Recommendations	17





Monitoring Matters

The Ausable Bayfield Conservation Authority (ABCA) has an 80 year history of environmental monitoring. Monitoring is a fundamental principle in the integrated process ABCA uses to manage watersheds. Monitoring will continue to inform decision makers, track changes to baseline conditions and evaluate our current land use and practices.



Mission

Protect, improve, conserve and restore the watershed in partnership with the community.

Vision

Healthy watersheds where our needs and the needs of the natural world are in balance.

Goals of Monitoring

1

Detect imminent threats of drought, flooding and erosion.

3

Identify long-term changes within our environment.

2

Understand the state of our land, water, plants, and animals.

4

Determine the effectiveness of our land use and management practices.

Data



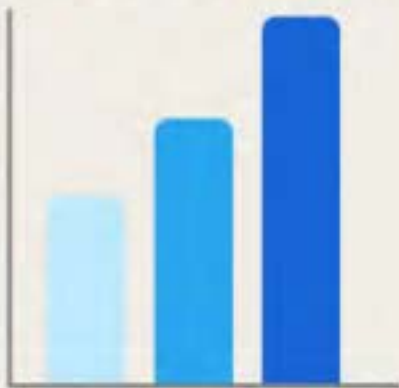
Sorted



Arranged



Presented



Explained With a Story



There is more to monitoring than sampling.

The collected data needs to be sorted and analysed to tell a story. Data analyses at ABCA requires ongoing strategic relationships.

Water Quantity

ABCA maintains a network of water level and climate stations to track the movement of water across our landscape. Measuring water quantity is about more than just predicting floods or droughts. The volume and speed of water in our systems directly dictate how much sediment and nutrients are carried downstream to Lake Huron. By monitoring real-time flow and precipitation, we gather the data needed to protect both human communities and aquatic systems.



Hydrometric Network

In partnership with the Ontario Ministry of Natural Resources (MNR) and Environment and Climate Change Canada (ECCC), ABCA operates 13 hydrometric stations. This remote and automated system continuously monitors water levels, automatically transmitting real-time discharge data so staff can track changing conditions across the watershed.

Snow Course

During the winter, snow is measured bi-weekly at eight sites across the watershed. By tracking water equivalent from the snow depth, we can calculate exactly how much water is stored on the landscape and predict how much will be released during a spring melt or sudden thaw event.

Volunteer Rain Gauge Network

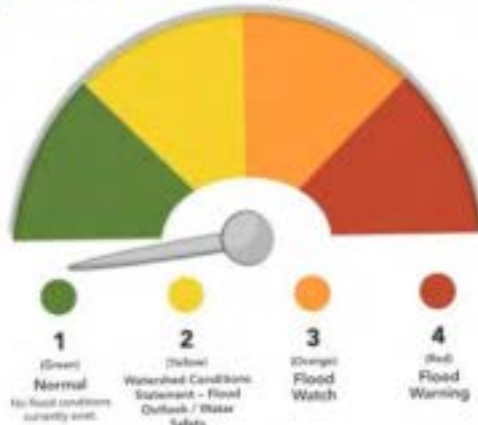
To supplement rain data from the hydrometric stations, ABCA manages a network with twenty volunteers, annually. Participants report on rainfall amounts collected with rain gauges on their properties. This data helps cover gaps between existing stations and help staff better understand conditions across the watersheds.

Flood Forecasting

ABCA assesses flooding risks by combining real-time data from our 13 hydrometric stations, weather forecasts, and winter snow measurements. This information feeds into predictive models that gauge where and to what extent flooding may occur, allowing us to issue timely flood messages to affected municipalities and public to ensure community safety.



Flood Message Levels



Water and Climate

Climate and water are fundamentally connected. Longer-term changes to our climate will affect both the availability and quality of freshwater and intensify floods, droughts, and other water-related issues for freshwater plants and animals.

Since 2012, ABCA has operated an integrated water and climate monitoring station near Parkhill. The Parkhill station is the most complex in Ontario, with 29 sensors measuring 33 different indicators, including meteorological conditions, water quantity and quality, and soil properties.

To capture local variations across the watershed, ABCA also operates three additional weather stations that collect real-time data on precipitation, temperature, soil moisture, and wind.

Ontario Low Water Response

When prolonged dry weather occurs, the Provincial Low Water Response Program guides our local response to low water conditions. ABCA analyzes streamflow and precipitation data to assess drought severity, sharing these findings with a local water management committee. Depending on the severity level, we issue low water advisories or implement practices to balance the water needs of residents, agriculture, and local ecosystems.

Groundwater

Provincial Groundwater Monitoring Network

Groundwater is an important source of clean drinking water and steady streamflow. Since 2001, ABCA has partnered with the Ministry of the Environment, Conservation and Parks (MECP) and our member municipalities to monitor major aquifers through the Provincial Groundwater Monitoring Network (PGMN). We collect water quality and water level data at 16 dedicated wells across the watershed, helping us track shifting water demands and catch potential contamination risks from both human and natural causes.

Huron Sentinel Wells

Stemming from a 2001 report for Huron County, the Sentinel Well program tracks regional groundwater safety over time. ABCA conducts annual testing at six representative drinking water wells across the county. These wells are monitored for nutrients, bacteria, and metals (such as naturally occurring arsenic) that could be harmful for human consumption. This monitoring provides the baseline for safety of the region's drinking water supplies.



Water Quality

The concentrations of nutrient, sediment, mineral, metal and bacteria in our streams can indicate land management practices and soil conditions across our watersheds. By pairing water quality data with flow volumes, we can calculate the total load of potential pollutants moving through the system. We compare these values with stated objectives from the Provincial and Federal governments to evaluate if our waters safely support drinking water standards, recreational activities, and healthy aquatic life.

Setting a Baseline

Monitoring long-term baseline conditions allows us to evaluate current conditions, track environmental shifts over time, and measure the true effectiveness of local stewardship programs. If an unexpected environmental issue arises, having an historical baseline is what allows for the detection and actions to address the emerging issue.

Identifying Gaps

While our baseline data is robust, environmental monitoring must constantly evolve. We recognize the need to improve information sharing and expand beyond routine schedules. While routine monitoring tells us the "everyday" story; targeted, event-based sampling (such as after intense rainstorms) and site-specific evaluations are critical to understanding watershed processes.

Ultimately, diagnosing a water quality issue may be simpler than implementing the landscape-scale solution to fix it. Ongoing management will require continued collaboration with local and regional partners. The analysed data will help to guide important landscape level decisions.



Provincial Water Quality Monitoring Network

Since 1964, ABCA has partnered with the Ministry of the Environment, Conservation and Parks (MECP) to sample surface water through the Provincial Water Quality Monitoring Network (PWQMN). Out of 433 sites across Ontario, nine are located within ABCA watersheds. Many of these sites are strategically co-located with stream gauges, climate stations, and biomonitoring sites to give us a complete ecosystem picture. In 2003, we added eight "enhanced" sampling sites to fill geographic gaps and introduced routine *E. coli* testing across all baseline stations to better track fecal contamination risks.



Biomonitoring

Aquatic animals, including insects, freshwater mussels and fish are sensitive bio indicators. The numbers of the different animals can evaluate ongoing stewardship efforts designed to reduce threats to river health.

Some of the freshwater mussel and fish species found in the ABCA watersheds are species at risk. These species are sensitive to threats such as nutrient enrichment, sediment loads, low oxygen concentrations and invasive species. ABCA works closely with Fisheries and Oceans Canada (DFO), who provide important funding to conduct species population tracking and habitat enhancement. This specialized monitoring program helps to match local stewardship dollars (3:1) resulting in an improved river for the animals and the people that live in the Ausable and Bayfield Watersheds.

Mussels

The ABCA watersheds are home to 28 species of mussels. Mussels are stationary filter feeders, making them highly susceptible to changes in water quality. This lack of mobility makes them exceptional long-term bioindicators. Mussel surveys conducted at dedicated index stations provide vital data on abundance, diversity, and the presence of species at risk, helping us evaluate the effectiveness of local stewardship projects.



Benthics

Benthic macroinvertebrates are small, spineless animals that live at the bottom of our streams. Because different animals have a different tolerance to pollution, they can be used as indicators to tell us about the state of the watershed.

ABCA's long-term benthic monitoring has successfully informed critical decisions regarding wastewater treatment plants, municipal landfills, and long-term agricultural cropping practices. These stations are associated with water quality sites, giving us an immediate "snapshot" of water chemistry and a long-term look at biological health.

Fish

Fish hold recreational and economic value for our community, with at least 90 species (including some at risk) found in the ABCA watersheds. Certain species are highly sensitive to environmental degradation, so their presence or absence provides insight into water health factors such as temperature, available oxygen, and clarity.



Monitoring to Manage

Old Ausable Channel (OAC)

The OAC is a 14-kilometre river between Grand Bend and Port Franks. Cut off from the main river over a century ago, this spring-fed stream faces human-induced threats from local runoff. The resultant algal blooms reduce oxygen concentrations and impact the species at risk fish. With the help of residents and Pinery Park staff, water quality, temperature, and oxygen concentrations are monitored. This data tracks the success of local management actions taken by the community to protect the sensitive species and this rare ecological gem.

Huronview Demonstration Farm

This area is home to the most productive agricultural land in the country, and we support community-led soil monitoring and management. Some partners include producers, Ontario Soil and Crop Improvement Association and their local county chapters, as well as the University of Guelph.

One example of this important relationship is monitoring water, soil, and crop yields to evaluate environmental and economic best practices on a farm-sized scale. Located south of Clinton, Ontario, the rolling fields at Huronview had a farming system that led to low soil fertility and erosion along the Bayfield River. In 2009, the Huron Stewardship Council installed riparian buffers and wetlands. In 2014, the County of Huron leased the property to the Huron Soil and Crop Improvement Association to work with ABCA to measure the effects of reduced tillage, cover crops, and innovative tiling approaches.

Lands

Land and water are fundamentally connected. The health of our rivers depends entirely on the forests, wetlands, the soil and fields that surround them. How we manage these landscapes directly impacts water quality, controls erosion, and builds climate resilience. While there are some monitoring projects that link land management practices to water, more effort to measure forest, wetland and soil conditions would help to inform decisions about important natural assets.

Geographic Information Systems (GIS)

Data tells us what is happening at a single point in time. GIS allows us to see the bigger picture. By mapping our landscape features such as topography, soil characteristics, and land use, water quantity and quality data can be transformed into visual, actionable information.

The use of continuous data with spatial analyses allow us to 1) predict and model active hazards such as flooding and erosion and 2) map pollution pathways. To ensure our digital models match reality we verify data with field observations. Spatial modeling helps to identify prime locations for conservation practices, such as wetland enhancements. This mapping can also identify other projects that will have the greatest impact on water quality and help reduce flooding and erosion.

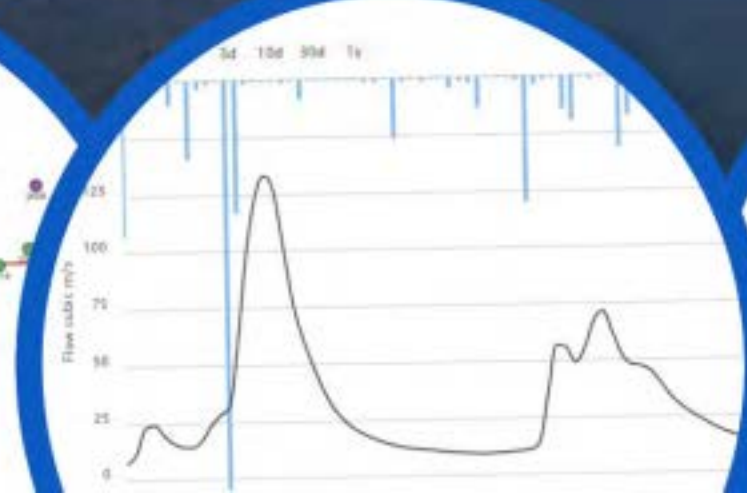
Turning Data into Information

Data Management

Effective data management is the backbone of our monitoring program, ensuring the hundreds of thousands of records generated annually remain accurate, accessible, and actionable. We maintain strict quality assurance and quality control protocols to ensure every sample, measure, observation, and spatial record is verified and reliable. By centralizing this data into secure, organized databases, we protect baseline data from decades past. This careful management ensures our data remains trustworthy, allowing analysts to confidently identify long-term trends and create information to share with our partners and our community.

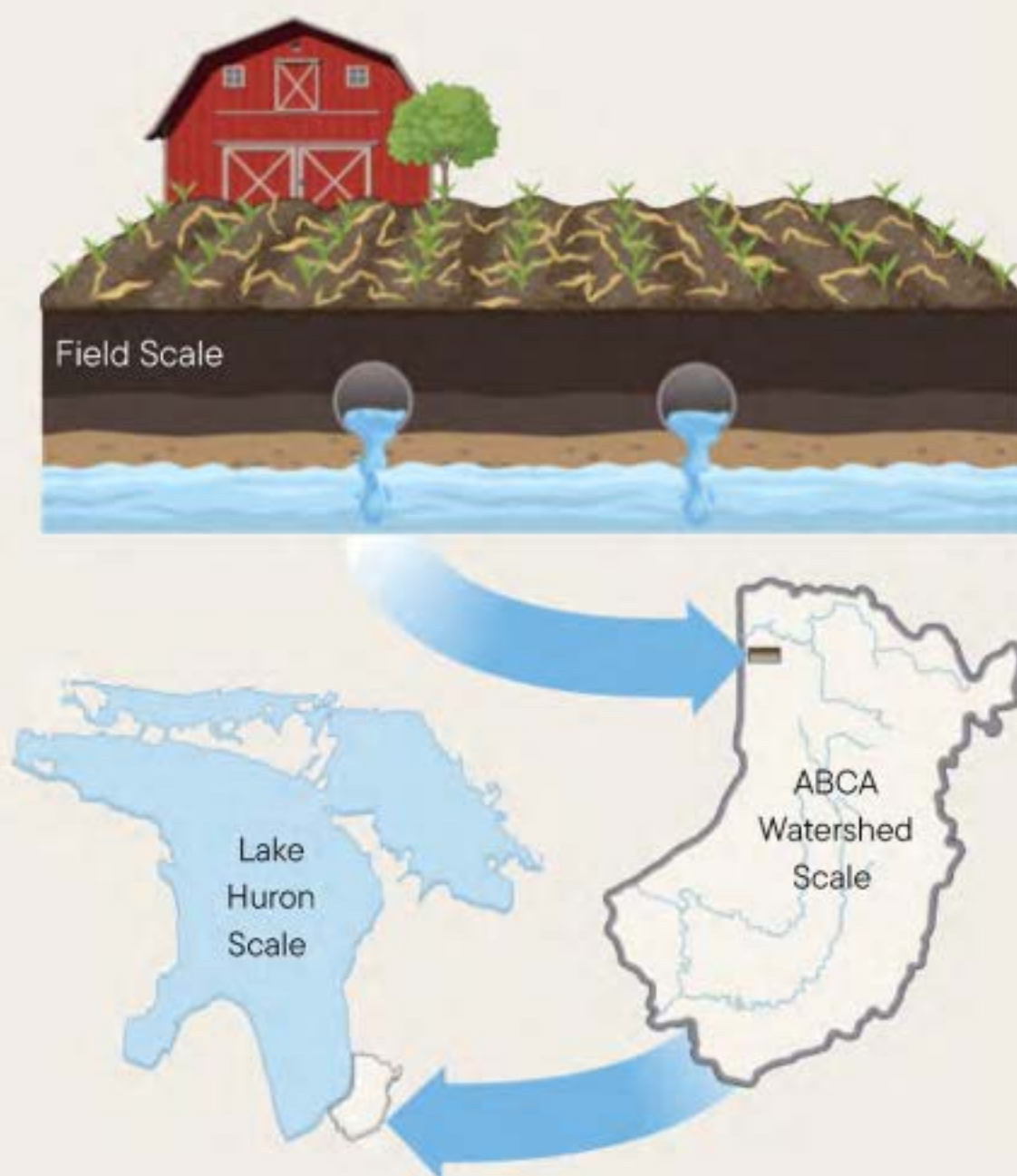
Communications

Information belongs in the hands of the community, not hidden in databases or spreadsheets. We translate technical monitoring data into clear meaningful information. This information can be delivered in flood messages, occur in reports on our website, or be presented at public events. By sharing our watershed's story transparently, we build local trust, celebrate conservation successes, and inspire residents to become involved in stewardship on the landscape.



The Importance of Scale

Water issues like flooding, erosion, and habitat loss don't stay in one place—they spread across the landscape, creating challenges that can't be solved by individual properties or projects alone. That's why we monitor water at multiple scales, from individual fields and local ravines to the entire Lake Huron shoreline. By linking local data with watershed-wide monitoring, we can identify effective solutions, apply them more broadly, and improve the health of the environment.



Leveraging Community Interests

Our watersheds have unique ecological conditions that matter deeply to local residents and regional partners alike. Monitoring community priorities helps us build grassroots support and leverage important environmental grants to scale up our conservation efforts.

Shoreline

ABCA works with the Bluewater Shoreline Residents' Association to run weekly beach and ravine sampling for *E.coli* and the University of Waterloo to use citizen science to capture pictures of the shoreline overtime.

By tracking shoreline conditions we can show residents how runoff and changing lake levels impacts their shoreline. This monitoring provides transparent, local environmental data along the Lake Huron coast.

Turtle Monitoring

The ABCA watersheds are home to all native species of turtles found in Ontario. Turtles act as nature's clean up crew helping to maintain healthy rivers by eating decaying animals, aquatic vegetation and insects. Turtle populations are threatened by habitat degradation and road mortality. ABCA supports local communities to monitor turtle populations and protect turtle nests each year. These efforts aid in turtle species and habitat conservation long term.



Recommendations

1. Understand soil and water linkages from an agricultural perspective

- Conduct cost benefit analyses required for best management practice uptake.

2. Maintain strategic relationships

- Partnerships maintain costs and meet different objectives for water management.

3. Fill gaps in our monitoring network

- Conduct event-based groundwater sampling of areas affected by karst geology.
- Add a stream gauge for Nairn Creek to improve flood forecasting.
- Invest in biomonitoring information for the Parkhill Creek.
- Use fisheries data to inform upstream best management practices.
- Track shoreline changes with citizen-derived photography.
- Review shoreline recession rates.
- Value our natural areas: inventory forests, wetlands, rivers, parks that we own.
- Encourage use of citizen-science precipitation monitoring, such as CoCoRaHS.

4. Move beyond baseline monitoring

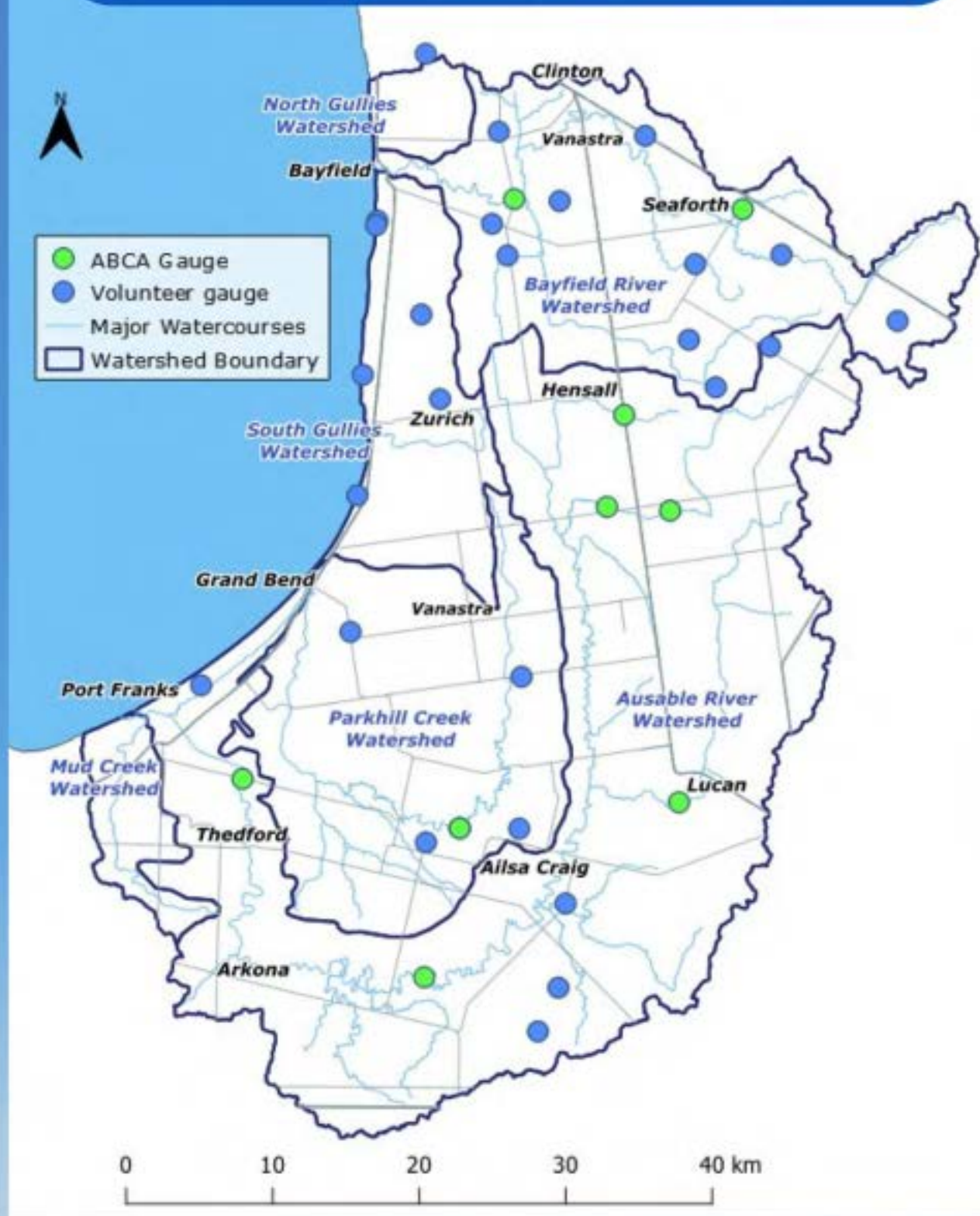
- Compare event-based data from Tricks Creek, Parkhill and Huronview sites to evaluate climate and land management on water in different landscapes.

5. Continue to build capable staff

- Update the hydrologic model to predict flooding and erosion risks.
- Translate our science into clear, shared knowledge.



Monitoring Rainfall: ABCA and Volunteer Rain Gauges



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