

Conservation & Agriculture in the Saginaw Bay Watershed

History

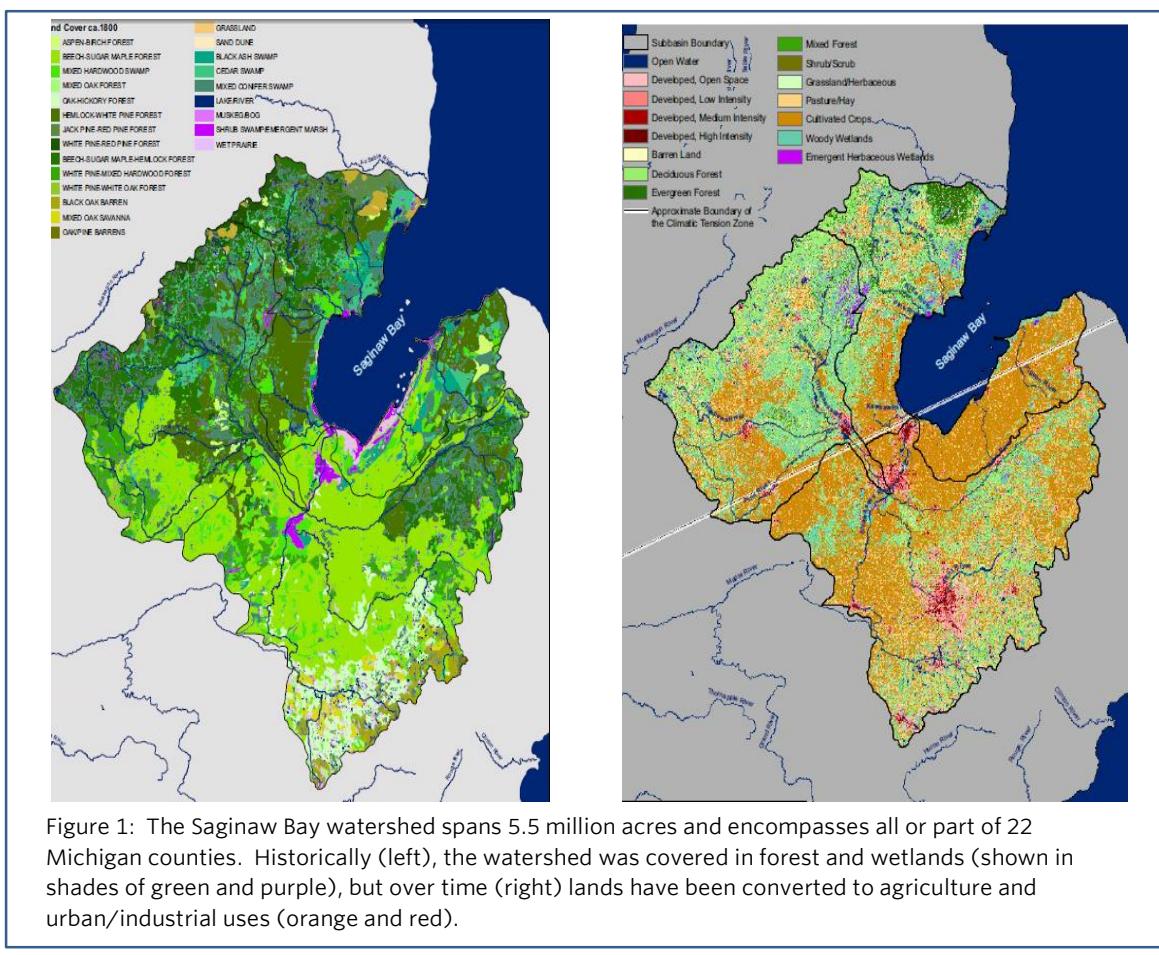
The Saginaw Bay watershed is the largest in the state of Michigan, spanning 5.5 million acres and 22 counties. The ecological health of Saginaw Bay and its tributaries is critically important, not only to Lake Huron, but the entire Great Lakes ecosystem, as this watershed provides vital ecosystem services for both nature and people, including fish spawning habitat and abundant farmland.

Yet, two centuries of human activity have highly impacted Saginaw Bay and its watershed. Intense demands on the shoreline and intensive agricultural land practices have altered land and water habitats, key ecological processes and hydrology, and degraded water quality. Most of the Bay's coastal wetlands have been lost; those that remain no longer connect to the lake and are no longer accessible to spawning fish.

One of the most significant drivers of change to coastal and inland freshwater habitats throughout the Saginaw Bay watershed is excess nutrients and sediment entering rivers and lakes due to poor land use practices. With agricultural land use covering 45 percent of the watershed's land area (Figure 1), it is crucial that we work to understand how to properly manage this land to balance agronomic and environmental needs.



The Saginaw Bay watershed is Michigan's largest.



Vision

In conjunction with the Conservancy's Great Lakes Project, the Michigan Chapter is working to ensure that the Saginaw Bay watershed continues to provide vital ecosystem services for both nature and people over the long term.

At the core of the Saginaw Bay Watershed Project is the strategic implementation of agricultural conservation practices (i.e., best management practices or "BMPs") that will lead to improved ecological health of the watershed as measured by the health of the watershed's river and stream fish communities.

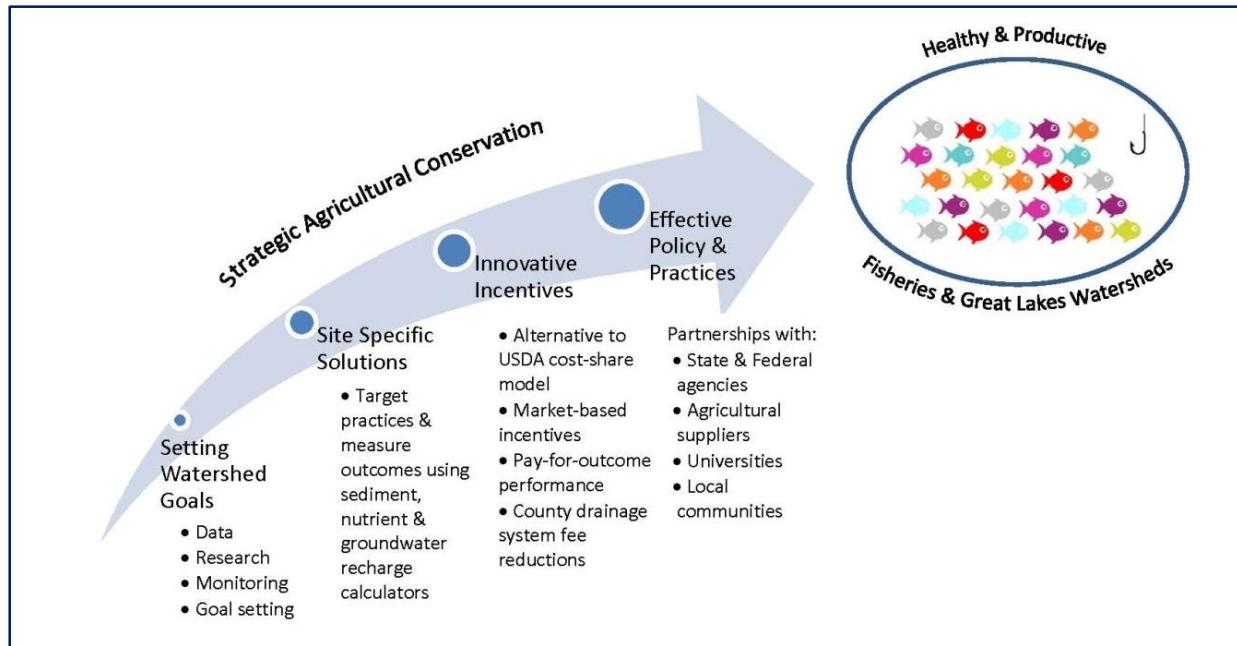
Setting Goals and Strategies

The first step toward achieving this vision was to develop scientific computer modeling that would allow us to link conservation practices to ecological indicators and to set realistic goals. Next, in collaboration with partners, we developed an online conservation decision-making tool to enable land managers to strategically target conservation practices that have been identified as having the potential to yield the greatest return on conservation investment. The Conservancy is now working with partners and land managers to put this science and conservation technology into practice.

To ensure the adoption of BMPs and, ultimately, the improvement of ecological health in the Saginaw Bay watershed, we are employing a suite of strategies:

1. Develop conservation goals that are linked to predicted ecological outcomes.
2. Use models to target conservation practices to areas with the greatest conservation need.
3. Develop and deploy financial incentives to agricultural land managers that are tied to pollutant reduction results.
4. Work with partner organizations—both traditional and new—in the Saginaw Bay region to deliver conservation programs locally.

The following graphic depicts how we aim to reach our goal of improving the ecological health and aquatic biodiversity in the Saginaw Bay watershed, measured by fish community health.



How Much is Enough?

Our work in the region started with trying to find answers to a fundamental question that has plagued resource managers for decades: How much conservation is enough to achieve desired ecological outcomes? Traditionally, agricultural BMPs have been implemented haphazardly across broad landscapes. Although some progress has been made toward ecological improvement, our analysis suggests that by targeting these

same practices to specifically *at-risk* areas in the watershed, desired ecological results can be achieved more efficiently.

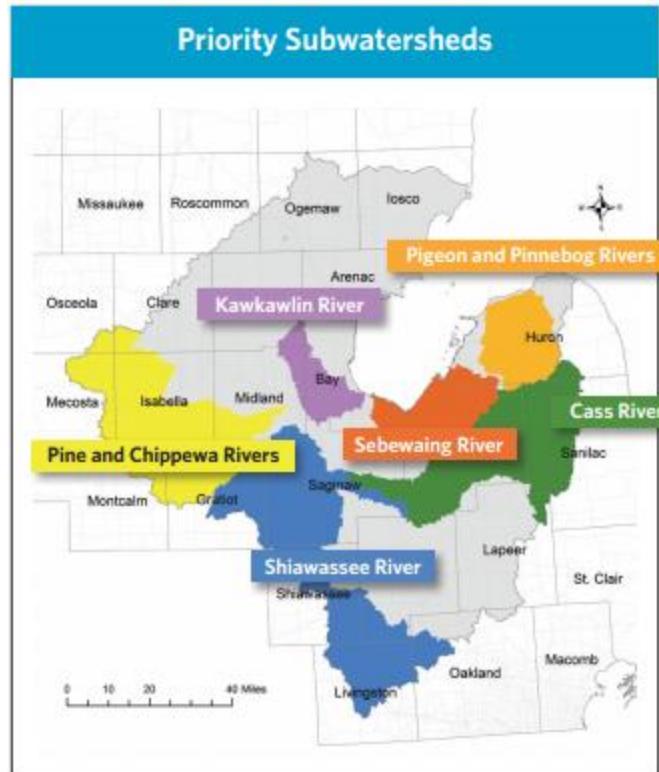
Geographic Focus and Outcomes

Several focus areas representing a range of agricultural footprints were identified prior to modeling: The Cass, Kawkawlin, Pigeon/Pinnebog, Pine/Chippewa, Sebewaing and Shiawassee River watersheds (pictured at right). For each sub-watershed we then used the “How Much Conservation is Enough?” model to forecast fish community condition based upon improvements in water quality and flow achieved through various conservation scenarios.

In general, this model helps resource managers determine realistic ecological goals and related conservation actions, as well as which specific areas of these sub-watersheds would result in the most ecological benefit from an intensive effort to implement BMPs.

Best management practices recommended to achieve sediment and nutrient reductions in Saginaw Bay watershed include:

- nutrient management plans
- cover crops
- conservation tillage
- conservation cover
- drainage water management
- filter strips
- hay and pasture plantings
- wetland restoration



The “How Much Conservation is Enough?” model provides the Conservancy and its partners with the scientific answers needed to set realistic goals and to identify high-priority areas that are most likely to see ecological improvement as a result of agricultural conservation practices.

Strategic Agricultural Conservation

The Conservancy is working hard to rethink the traditional mechanisms that deliver and fund such conservation practices at the farm scale. We are collaborating with a wide variety of public and private partners to develop and test new, more targeted and effective ways to incentivize farmers to implement BMPs on their land. Current activities include:

- *Site-Specific Solutions:* In partnership with the Michigan State University Institute of Water Research, The Nature Conservancy developed online tools to help resource managers target practices and measure outcomes at the farm scale. Sediment, nutrient, and groundwater recharge calculators are now online and available through the Great Lakes Watershed Management System (www.iwr.msu.edu/glwms). This tool allows users to quickly and easily report the benefits of installing practices on specific farmland.
- *Engaging Agribusiness in Conservation:* In partnership with the Michigan Agri-Business Association (MABA), the Conservancy is engaging with agribusinesses as a delivery system for conservation practices. Agronomy retailers and their on-staff crop advisors, who already provide year-round advice and technical assistance to growers, are working directly with them to deliver approved, measurable conservation practices in our six priority watersheds. The eligible conservation practices, including cover crops, conservation tillage and nutrient management, are being promoted by agribusiness partners to their local client base to help reduce runoff of sediment and nutrients to nearby waterways.

- *Innovative Incentives:* The Nature Conservancy is also currently partnering with the Gratiot, Huron, and Sanilac Conservation Districts to test a new way to financially incentivize land managers to implement BMPs on farms, demonstrating an alternative to the current USDA cost-share model. This new approach focuses on paying for measured conservation performance instead of acres enrolled. This pay-for-performance (PfP) approach links financial compensations to the amount of environmental benefit derived from the adoption of new conservation practices.

Unlike traditional conservation programs where flat rates are paid per acre enrolled, the PfP method pays participants for every ton of sediment reduced or every gallon of groundwater recharged (depending on whichever conservation scenario is better suited to the unique situation). In this way, payment amounts are directly tied to a participant's conservation performance and, as such, there are no minimum or maximum payment amounts and no field within an eligible watershed is denied enrollment. Instead, low impact fields accordingly receive lower payments and high impact fields accordingly receive larger payments.

- *Effective Policy and Practices:* The Michigan Agricultural Environmental Assurance Program (MAEAP) is a non-regulatory, voluntary certification program which requires farmers to thoroughly assess their farms for environmental risk factors and take actions to address those risks. The Conservancy is a member of the MAEAP partnership and is working with MAEAP staff and other partners to help establish program goals that are linked to ecologically meaningful watershed goals.

For more information on The Nature Conservancy's work in the Saginaw Bay watershed, please visit www.nature.org/saginawbay.