The Nature Conservancy
Michigan

SOIL

It's easy to think of soil as "dirt," but soil is so much more. It is a living system, rich in micro-organisms and nutrients, that sustains everything that grows on this green earth. The type of soil and its condition dictate what plants can grow, as well as how water flows and what it carries with it through the landscape. When it comes to healthy, thriving lands and waters—everything comes back to soil.

For a sustainable future, one of the most important questions to address is how to feed a growing population while also protecting clean water. Luckily, the answer is right beneath our feet.

MICHIGAN: OUR AGRICULTURAL LEGACY

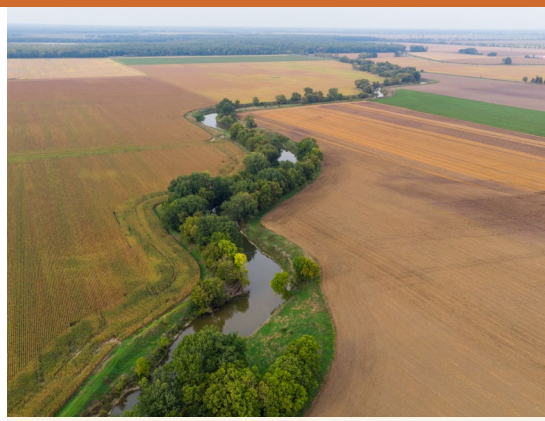
Agriculture is an important economic sector in Michigan, generating $13 billion annually and providing more than 20% of our state's jobs. However, some common farming practices used in Michigan and across the country have inadvertently weakened soil health over time, putting the future productivity of these lands and waters at risk. As soil loses sediment and nutrients like phosphorus in runoff, this runoff also increases the threat of toxic algal blooms or dead zones (oxygen-poor water that cannot support life) in the Great Lakes—a vital freshwater resource for people and nature.

SEEKING BALANCE FOR PEOPLE AND NATURE

If you're a farmer, you know your livelihood depends on healthy soils. But changing the way you farm can be risky and expensive, and a failed crop is hard to come back from. In Michigan's agricultural watersheds, most notably the Saginaw Bay watershed, The Nature Conservancy (TNC) is working to encourage farmers—and make it easier—to shift to practices that restore and sustain long-term soil health and reduce harmful runoff.

Ultimately, we all depend on clean water and fresh food. TNC believes that productive agriculture and healthy ecosystems can coexist, if we address where they intersect: the soil.

COVER: Farmer Steven Tait with TNC's Ben Wickerham. © Jason Whalen/Fauna Creative; RIGHT: River running through agricultural fields in the Saginaw Bay watershed. © Jason Whalen/Fauna Creative



GOAL

Working collaboratively with farmers, we aim to expand soil health practices across 1.8 million acres (50% of the Saginaw Bay watershed's row crop acres), to reduce nutrient runoff by 40%.

OUR STRATEGIES

INCENTIVIZATION

Beginning in 2011, TNC connected Saginaw Valley farms and conservation through a suite of incentivization projects. This includes our groundbreaking Saginaw Bay RCPP project (see page 4), as well as a "pay-for-performance" program that reimbursed farmers for using conservation practices based on the benefit to soil and water quality, instead of the number of acres. The partnerships and knowledge generated by these projects have given us a strong foundation for lasting change.

ENGAGEMENT

Connecting with farmers is extremely important to the long-term success of TNC's work in soil health and water quality—from getting helpful information into the hands of those who need it, to identifying and supporting champions of conservation. TNC hosts a quarterly workshop series for farmers as well as a biennial recognition program for our "Soil Health Heroes," and organizes and supports farmer-led networks.

COLLABORATION

TNC also partners with agribusinesses, crop advisors, food companies and public agencies to support them in building conservation into their business models and to expand the reach of soil health practices. For example, we partnered with the Michigan Corn Growers Association to bring the national Soil Health Partnership (www.soilhealthpartnership.org) to our state, and continue to work with county drain commissioners on an incentive program for farmers that reduces their drainage fees.

SCIENCE

TNC leverages data and research to focus our work in the places that can have the biggest positive impact on water quality and soil health. This includes studying the effects of specific practices, such as using strip tillage to reduce the impacts of farming sugar beets, as well as analyzing the economic and social dimensions of the barriers and opportunities that farmers face.

ABOVE, LEFT: Farmer Mike Milligan showing healthy soil on his farm. © Jason Whalen/Fauna Creative; ABOVE, RIGHT: Sugar beet field in the Saginaw Bay watershed © Jason Whalen/Fauna Creative

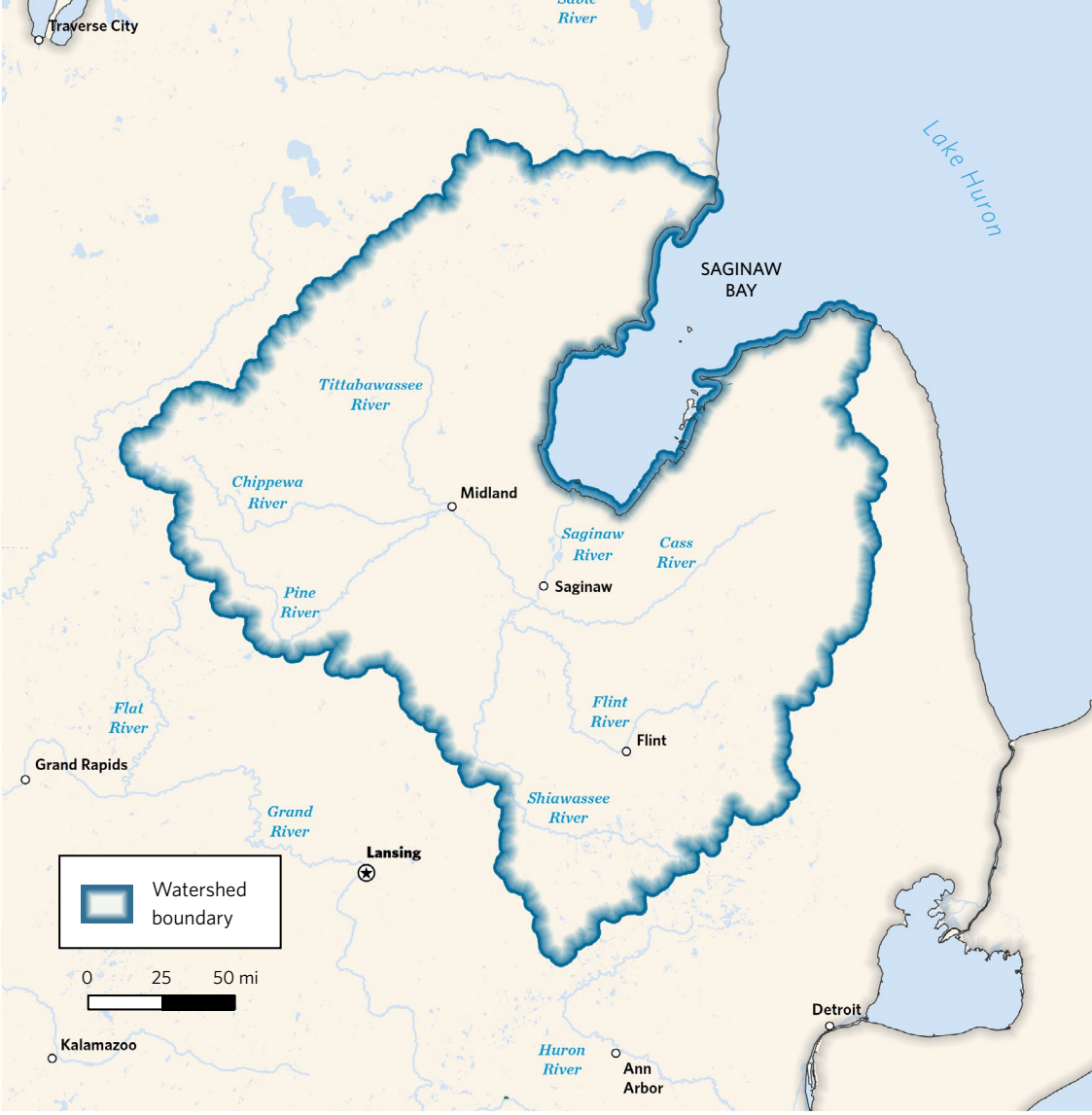
TOOLS FOR SOIL HEALTH

- The Great Lakes Watershed Management System (www.iwr.msu.edu/glwms) allows us to target practices where they have the greatest benefit.
- Healthy soil stores more carbon, reducing agriculture's impact on a changing climate. Tools like COMET-Farm (www.comet-farm.com) enable TNC to track and pursue the carbon benefits of healthier soils.
- Remote sensing data through the Operational Tillage Information System (www.ctic.org/optis) helps us map changing crop cultivation practices at a regional level.

ABOVE: Pollinators like monarch butterflies can benefit from flowering cover crops. © Jason Whalen/Fauna Creative

SOIL HEALTH PRACTICES:

- **Conservation tillage:** A method of producing crops that disturbs the soil and surface cover as little as possible, reducing soil loss. This includes strip tillage and no-till practices.
- **Cover crops:** Crops such as rye or wheat that are planted between rotations to protect bare fields, retain nutrients, reduce erosion and improve soil structure.
- **Drain water management:** The practice of using controlled drainage structures to manage water levels in farm fields in order to retain water and nutrients.
- **Filter strips:** Narrow strips of vegetation planted between a farm field and an ecologically vulnerable area, such as a stream, to reduce erosion and runoff.
- **Nutrient management:** A range of activities aimed at reducing the need for fertilizers by using the 4Rs: the Right Source of Nutrients at the Right Rate and Right Time in the Right Place.



KEY PROJECTS

Farmer-Led Networks

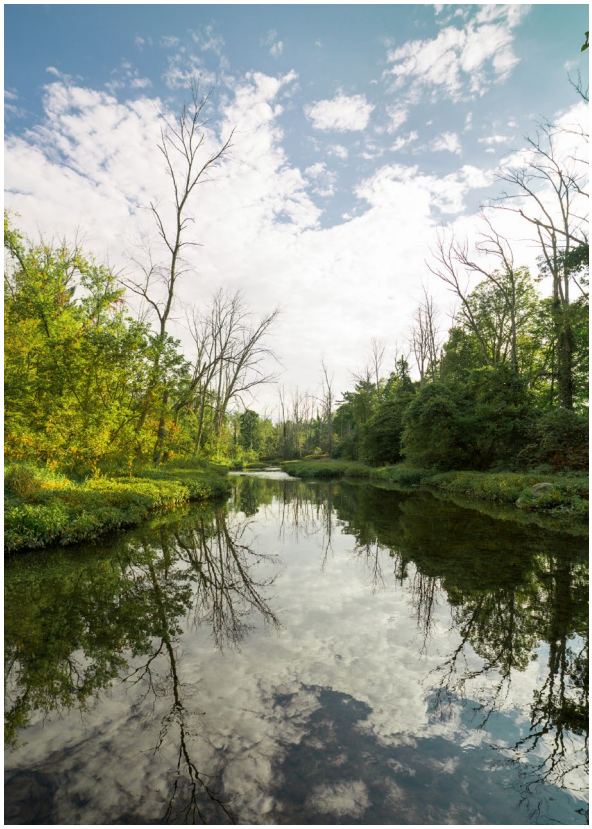
In August 2019, on a farm in the Saginaw Bay watershed, farmers came together to discuss soil health—and stayed long after the planned end of the meeting. By the second meeting, attendance had doubled. These farmer-led networks continue to grow rapidly. Since launching this first group, TNC has assisted Michigan State University in establishing several more, building a structure for knowledge-sharing that regional farmers can carry on into the future.

Saginaw Bay Watershed Monitoring Network

TNC and our partners are working to secure the robust data on water quality we need for the Saginaw Bay watershed, by developing a network and installing sensors that will allow a range of stakeholders to better understand how water quality is changing here—over time and at scale.

Supply Chain Incentives

TNC is working with Star of the West, a regional grain company, to incorporate incentive programs into the supply chain, will eliminate the need for a third party like TNC to become involved. In this way, wheat farmers will receive a bonus when they sell their product if they used certain conservation practices to grow it.



RIGHT: The Cass River is one of the main rivers in the Saginaw Bay watershed. © Jason Whalen/Fauna Creative

SUCCESS STORY: Regional Conservation Partnership Program (RCPP)

RCPP is a unique U.S. Farm Bill program that prioritizes funding for farms where local water quality is compromised and/or where there is substantial risk for erosion. Over five years, TNC channeled nearly $8 million of this funding into the Saginaw Bay RCPP project, which allowed us to work through the agricultural supply chain to increase awareness and use of conservation practices and develop methods scalable to other regions.

ABOVE: Farmer Ryan Shaw uses a shovel to check the soil health in his field. © Jason Whalen/Fauna Creative

BY THE NUMBERS

- **70,000 acres of new conservation practices**
- **Over 25,000 pounds of phosphorus kept out of the water**
- **Over 6,800 tons of sediment retained on farm fields**
- **Over 130 farmer partnerships secured**

GLOBAL CONNECTION

Agriculture is the single largest human use of land and water, using 60% of Earth's arable land and accounting for 70% of its freshwater use—yet experts predict production must grow by an additional 60% by 2050 to meet the needs of a growing population. TNC's efforts to advance agricultural conservation practices will be an important part of creating a world where people and nature can thrive together. Around the planet, from Brazil to southeast Asia to the Mississippi River basin, we are working with local communities to match the right practices with the right places to protect habitat and water resources—and the sustainability of our global food supply.

LEFT: TNC's Mississippi River program and Gulf of Mexico initiative are working with farmers and partners to slow the growth of or even reduce the Gulf of Mexico dead zone, by managing nutrients more efficiently in farm fields and restoring wetlands and rivers to capture nutrients and reduce runoff. © Carlton Ward Jr.

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