

CURRENT CONDITIONS ASSESSMENT: Land Stewardship in Southeast Michigan

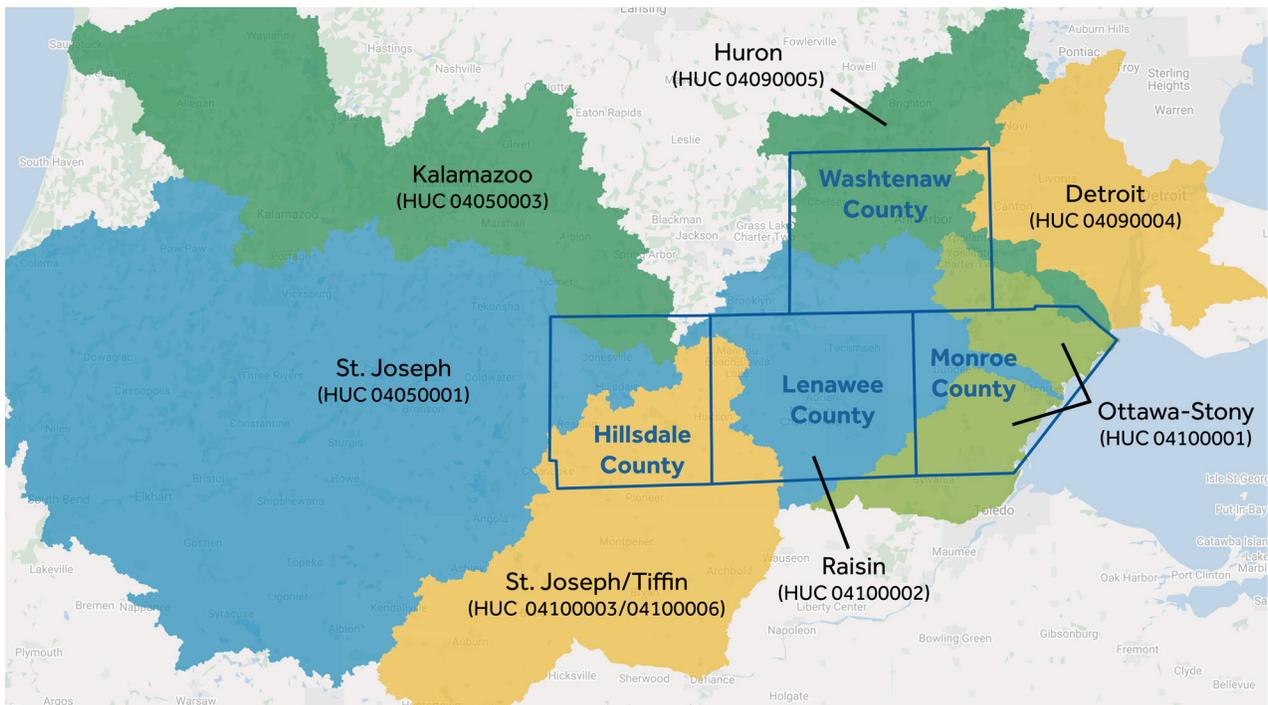
Introduction

With support from the Fred A. and Barbara M. Erb Family Foundation, Delta Institute seeks to engage landowners, land managers, and farmers to implement conservation practices in Southeastern Michigan, thus improving environmental outcomes. Specifically, we seek to improve water quality in the Great Lakes Basin through the reduction of nutrient loading and runoff. Transitioning to a different approach to land management will also enable farmers and producers to improve soil health and enhance the profitability and resiliency of their operation.

To better understand the socioeconomic, environmental, and political dynamics that impact the success of these agricultural

conservation programs, the project team at Delta Institute has compiled and summarized data on producer demographics, land use, cropping area, tenure status, conservation practices, and conservation program participation and outcomes.

This assessment also provides preliminary analysis of the data trends presented herein with a focus on four target counties located in Southeast Michigan. These counties, Hillsdale, Lenawee, Washtenaw, and Monroe, span the boundaries of eight subbasins, four of which drain directly into the western basin of Lake Erie (Figure 1). Note that St. Joseph/Tiffin is part of the Maumee River Watershed.



(Figure 1) The four target counties and eight target watersheds (HUC 8) in Southeast Michigan.

Image: Google My Maps

Key Takeaways

- Seventy percent of producers are between the ages of 45 and 74
- More acreage is being managed by fewer farm operations today than in the past.
- Nearly 40 percent of individual farm operations manage between 10 to 50 acres of land; with the next largest contingent of operations (27 percent) managing 50 to 179 acres.
- Eighty-eight percent of agricultural land is used as cropland - 45 percent is soybeans and 31 percent is corn.
- Conservation tillage and tile drainage are the two most widely applied conservation practices.
- Farm Bill payments are consistent in terms of average payments per contract and dollars spent per acre across counties in each program year.
- Strengthening the network of existing conservation organizations and initiatives could improve the region's capacity to identify opportunities, set priorities, compete for limited funding and ultimately implement conservation practices.

Producer Demographics

Agricultural producers in Southeast Michigan are individuals that overwhelmingly identify as white men, 70 percent of whom are between the ages of 45 and 74.

97 percent
of producers identify
their race as white.



66 percent
of producers identify
as Male.



Farm Operations: Acreage & Tenure Status

More than one million acres across the four target counties in Southeast Michigan are used for farm operations. While agricultural acreage grew by only 0.8 percent between 2002 and 2017, the number of unique farm operations decreased by about 10 percent during that same period. This suggests that while the total amount of farm acreage is staying relatively stable, a shrinking population of operators are managing that land. It should be noted that agricultural acreage has remained relatively stable in this geography. This trend is further supported by the fact that the average acreage managed by individual operations increased across each of the four counties between 2002 and 2017. In Lenawee and Hillsdale counties, operations grew by an average of nearly 16 percent in terms of acres operated. In Washtenaw and Monroe counties, a positive average growth trend was also observed, though the growth was not as significant.

These trends align with the changes occurring within agriculture at the state and national level. As agricultural land is being lost, there is consolidation of farms with fewer producers managing more acres. Agricultural acreage has decreased by roughly four percent from 2002 to 2017 for both Michigan and the entire US, while the number of operations have decreased by ten percent and four percent in that same time period for Michigan and the US, respectively. Though the average acreage did not change significantly between 2002

and 2017 in the US, the average farm operation size in Michigan increased by seven percent.

Sixty-five percent of operations across the four counties are identified as having full-owner tenure status (where all of the land contained in the operation is owned by the operator) and 73 percent of acreage is identified as part-owner tenure status (some of the land is owned by the operator and the remainder is rented). This suggests that larger operations (with more acreage) are more frequently subject to partial ownership or enter into contracts with tenants; whereas operations with full ownership status more frequently manage less acreage than their counterparts.

Of 4,896 farm operations across the four counties, nearly 40 percent manage between ten to 49.9 acres of agricultural land. The next largest portion of operations (27 percent) manage 50 to 179 acres. The abundance of small operations may pose a broad challenge to the adoption of conservation practices because smaller opera-

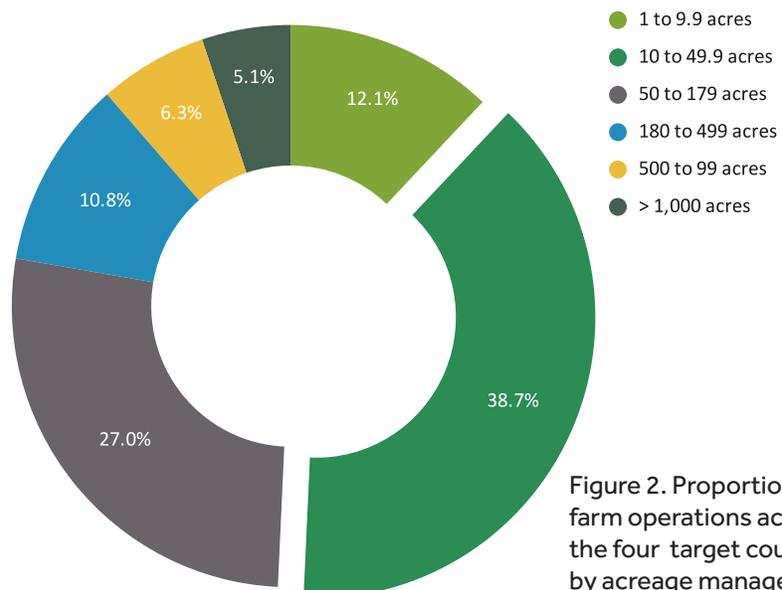


Figure 2. Proportions of farm operations across the four target counties by acreage managed.

tions likely have lower revenue and lower capacity (compared to larger operations) to implement on-field interventions or apply for competitive funding sources. Figure 2 (page 3) shows this breakdown in greater detail; Table 1 shows how many operations of each size were located in each county.

Table 1. Number of Operations by Size (acres) in Each County

County/ Acreage	1 to 9.9 acres	10 to 49.9 acres	50 to 179 acres	180 to 499 acres	500 to 99 acres	> 1,000 acres
Hillsdale	139	395	418	120	63	70
Lenawee	145	436	417	145	114	104
Monroe	177	449	212	131	71	45
Washtenaw	130	613	274	135	60	33
Total	591	1,893	1,321	531	308	252

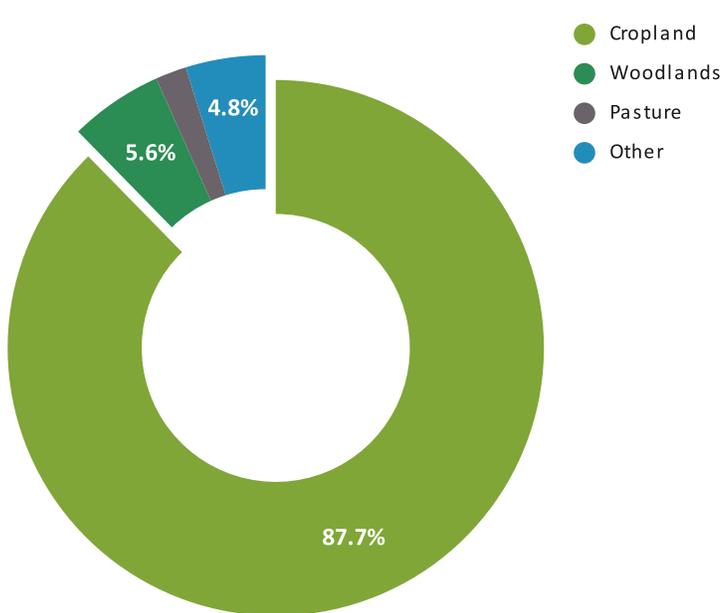


Figure 3. Proportions of total agricultural land use by type of land as reported by farmers.

Land Use & Livestock

The vast majority of agricultural land across the four target counties reported as cropland. Soybeans (45 percent) and corn (31 percent) comprise 76 percent of the total cropping area. The remaining land use designations are far smaller in terms of acreage, with woodlands and other uses, including "...farmsteads, homes, buildings, livestock facilities, ponds, roads, wasteland, etc.", being the next two most prominent land uses reported. The overall trends in Figure 3 are consistent within each of the four target counties. Additionally, hogs account for 40 percent of all livestock inventory; dairy cows 23 percent, and chicken and sheep 18 and 15 percent respectively. In 2016, 93 percent of all livestock were reported in Concentrated Animal Feeding Operations, primarily in Hillsdale and Lenawee counties.

Conservation Practices

Agricultural producers in the four target counties utilize a variety of conservation practices on their land. The most commonly used practices address a number of agricultural issues including erosion, nutrient loading, and soil health. Tile drainage is the most widely reported single practice among the suite of practices applied by producers on agricultural

land. Conservation tillage, both no-till practices and otherwise; and conventional tillage are also widespread. However, when considered as a single practice, conservation tillage is the most widely applied practice. Figure 4 shows the acreage on which practices have been applied in each of the four counties.

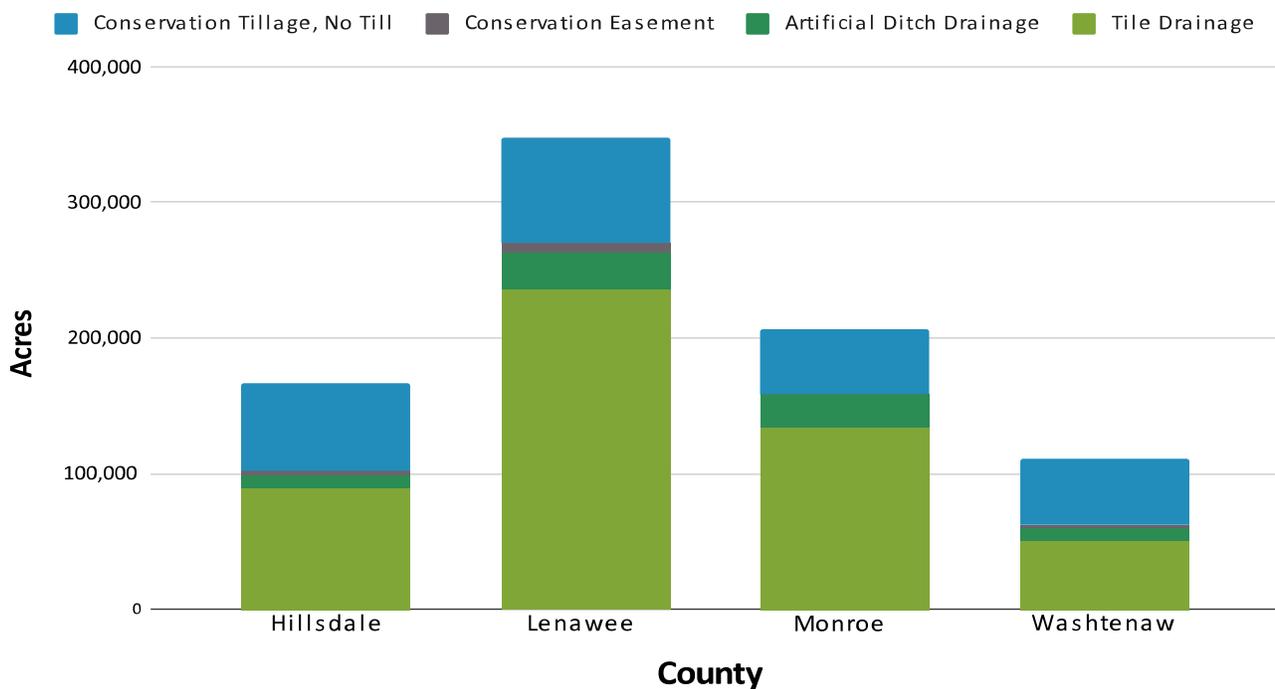


Figure 4. Amount of acreage in each county on which specific conservation practices have been applied. Though tile drainage is not typically considered a conservation practice, it is commonly found in this geography and is useful to illustrate overall rates of practice utilization.

Conservation Programs

Agricultural producers looking to apply conservation practices on their land have a variety of programs that offer assistance to aid these efforts, each with different priorities in terms of desired outcomes. Assistance is most commonly available through these programs in the form of financial, technical, legal, and outreach assistance.

Producers in Southeast Michigan participate in a variety of a programs promoting conservation

on agricultural lands. These programs are made available in different geographies and administered by a number of federal, state, and private entities. The following section describes the most commonly utilized programs in the four target counties and, for select programs, how effectively they've been implemented in those areas.

Federal Programs

Conservation Reserve Program (CRP)

Financial Assistance

Technical Assistance

Removal/Easement

Rental Payments

CRP provides financial and technical assistance to farmers and ranchers to address environmental concerns. Administered by the Farm Service Agency (FSA), it provides an annual payment to farmers who commit to removing environmentally sensitive lands from production and planting species that benefit the environment.

Environmental Quality Incentives Program (EQIP)

Financial Assistance

Technical Assistance

EQIP provides financial and technical assistance to farmers wanting to incorporate conservation practices into their farm operations. NRCS co-invests with farmers to implement practices like cover crops, forest improvement, irrigation, and prescribed grazing. Outcomes include reductions in nonpoint source pollution, more efficient nutrient usage, and improved soil health, which both support the quality of the environment and the operation of the farm.

Conservation Stewardship Program (CSP)

Financial Assistance

Technical Assistance

Removal/Easement

Maintain/Monitor

CSP provides financial and technical assistance to farmers looking to enhance their conservation practices and farm operation. Participants in the program receive payments for maintaining existing practices, with additional funding available for implementing new conservation practices. CSP enrolls the entire farm and is intended to support conservation practices that go beyond addressing immediate concerns.

Great Lakes Restoration Initiative (GLRI)

Financial Assistance

Technical Assistance

GLRI provides financial assistance to protect and restore the Great Lakes. It has five focus areas, with Focus Area 3 targeting nonpoint source pollution impacts on nearshore health. The objectives of this focus area are to reduce nutrient loads from agricultural watersheds, reduce untreated stormwater runoff, and to improve the effectiveness of pollution control and management.

Agricultural Conservation Easement Program (ACEP)

Removal/Easement

ACEP provides financial and technical assistance for conserving agricultural lands and wetlands, helping "Indian tribes, state and local governments and non-governmental organizations protect working agricultural lands and limit non-agricultural uses of the land." For working farms, the program helps producers keep their land in agriculture. ACEP also protects grassland, including rangeland, pastureland and shrubland.

Great Lakes Sediment and Nutrient Reduction Program (GLSNRP)

Financial Assistance

GLSNRP, administered by the Great Lakes Commission, provides grants to local and state governments and nonprofit organizations to install sediment and nutrient control practices. Two projects currently funded by this program in Hillsdale and Lenawee counties have received \$113,126 and \$50,000 respectively.

State Programs

Michigan Agricultural Environmental Assurance Program (MAEAP)

Technical Assistance

Certify/Verify

MAEAP is a voluntary program administered by Michigan Department of Agriculture and Rural Development (MDARD) designed to reduce agricultural producers' legal and environmental risks. It aims to teach effective land stewardship practices that comply with state and federal regulations and shows producers how to identify and prevent agricultural pollution risks on their farms.

Farmland and Open Space Preservation Program

Removal/Easement

The Farmland and Open Space Preservation Program, administered by MDARD, utilizes a number of financial tools including tax incentives and permanent conservation easement donations to incentivise landowners to preserve agricultural land as open space. Additionally, the program establishes funds for local governments to purchase development rights. In June 2018, 3.3 million acres of land were protected under this program; and, more specifically, by provisions in the Michigan Farmland and Open Space Preservation Act (P.A. 116).

Right to Farm Program

Technical Assistance

The Right to Farm Program (P.A. 93) provides outreach and assistance to farms for addressing nuisance complaints and assessing management practices and operations. Program staff also assess compliance under Michigan's Generally Accepted Agricultural Management Practices (GAAMPs) "While adherence to the GAAMPs does not act as a complete barrier to complaints or lawsuits, it does provide an umbrella of protection from nuisance litigation."

Michigan Biosolids Program

Technical Assistance

This program is administered by the Michigan Department of Environment, Great Lakes, and Energy (EGLE). MDARD's role in the program is providing education and technical assistance to those affected by the land application of biosolids. EGLE and MDARD have partnered with Michigan Farm Bureau, Michigan State University Extension, and the Michigan Water Environment Association to provide leadership and promote beneficial uses of biosolids and to make Michigan a national leader in environmentally sound Biosolids processes and products.

Private Programs

4R Nutrient Stewardship Certification Program

Technical Assistance

Certify/Verify

The Ohio AgriBusiness Association, on behalf of the Nutrient Stewardship Council, administers the 4R Nutrient Stewardship Certification Program. The program is a voluntary certification program which encourages agricultural retailers, service providers, and other certified professionals to implement proven best practices through the 4Rs, which refers to using the Right Source of Nutrients at the Right Rate and Right Time in the Right Place. Currently, four agricultural operations in Southeast Michigan are certified through the program; they are located in Saline (Washtenaw County), Blissfield (Lenawee County), Morenci (Lenawee County), and Litchfield (Hillsdale County). Moreover, 1.55 million acres in agricultural production are certified in Western Lake Erie Basin (WLEB). This program is most widely utilized in Ohio's portion of the Maumee River Watershed, the greatest source of nutrient loading into WLEB.

Federal Program Spending and Enrollment

Though federal conservation programs provide significant funding for agricultural conservation in the region, those programs engage only a small fraction of the operations across the four counties. For example, 89 percent of unique contracts among the selected programs were through CRP, but less than 10 percent of all producers in the four target counties enrolled land in CRP. Specifically, an average of 455 farmers in total were enrolled in CRP across the four counties in each program year. In 2017 alone, 4,896 unique farm operations were active across the four counties. Similar data was not available for EQIP and CSP.

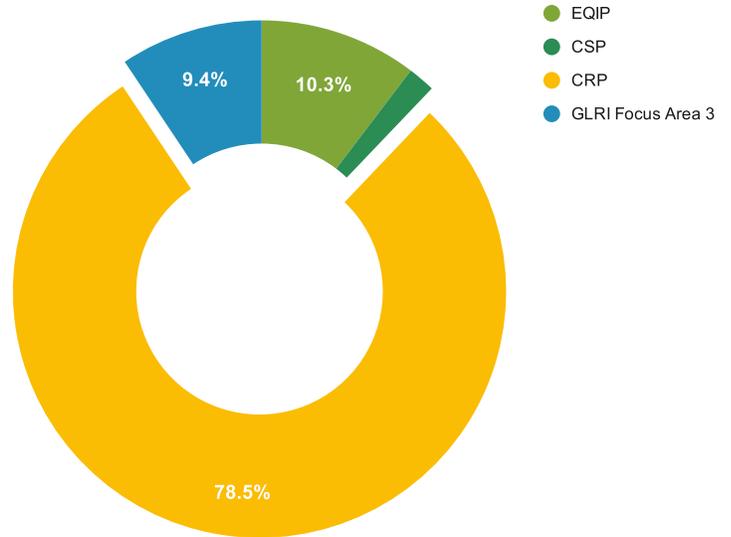


Figure 5. Proportion of total funding across the four target counties by federal programs.

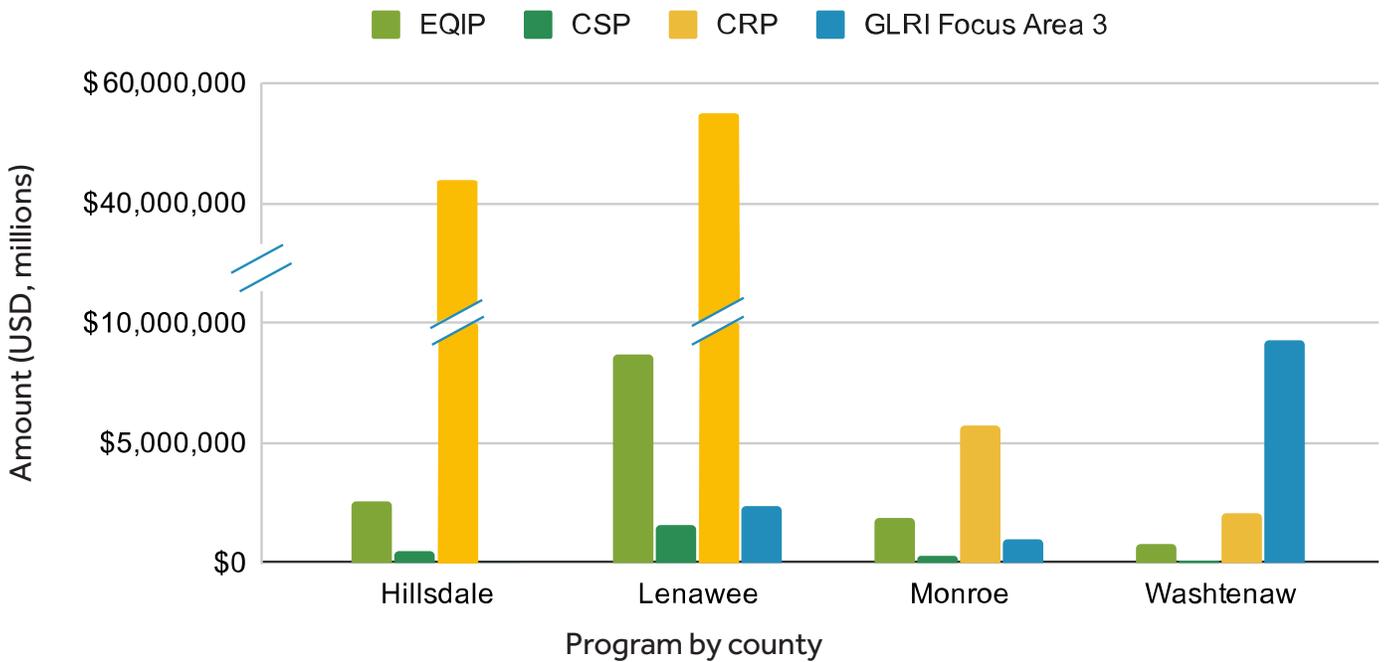


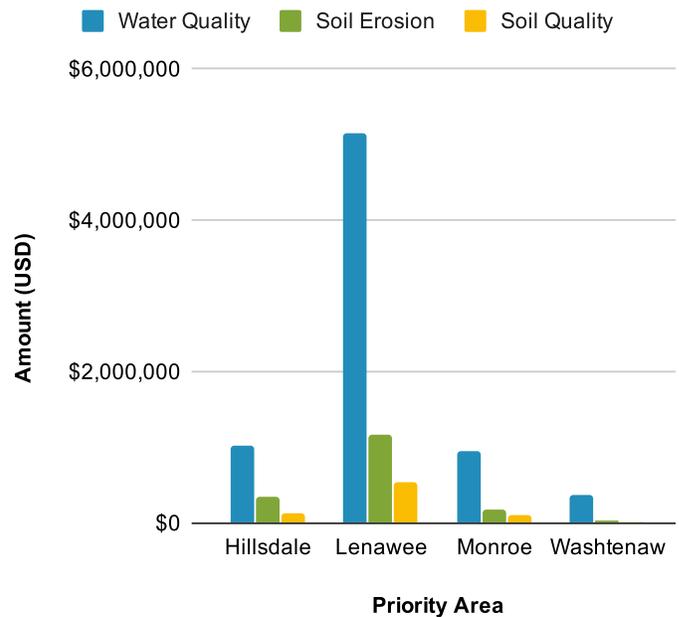
Figure 6. Total amount of dollars (USD, million) spent in each county by each federal program to date (most recently available data).

Nearly 80 percent of funding from federal conservation programs comes from CRP. The overall distribution of federal funding directed to the four counties through Farm Bill and GLRI programs is shown in Figure 5 (page 8). Washtenaw County is the only county that received more funding from GLRI than any other program. Figure 6 (page 8) shows how funds were directed in each county.

Across the four counties, the amount of money provided to producers via EQIP contract payments between 1998 and 2015 was highly variable; Washtenaw County, however, exhibited a substantially higher degree of variance (as great as 300% percent in some instances) in the amount of payments made through EQIP compared to the other counties. CRP payments, on the other hand, are more consistent in terms of dollars spent per program contract. Between the four counties, dollars spent per acre ranged from \$1,999 in Monroe County to \$2,949 in Hillsdale County. Though similar data was not available for CSP at the county scale, the average payment made through CSP across the entire state of Michigan was \$8,440 and covered 414 acres.

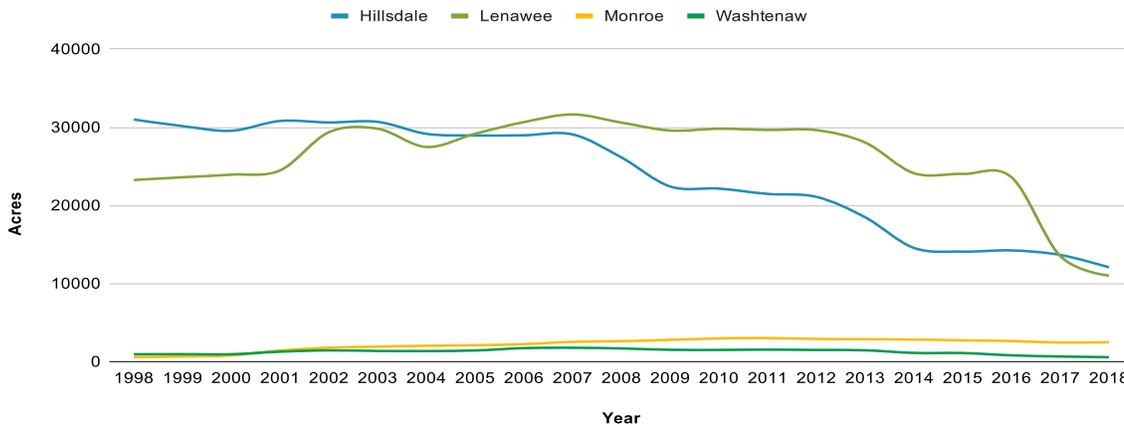
The significant majority of payments directed through EQIP and CSP have been made to address water quality concerns due to nutrient

loading (Figure 7). Note that GLRI Focus Area 3 funding is explicitly focused on improving water quality by addressing nonpoint source pollution. Additionally, note the total acreage enrolled in CRP has remained relatively stable in Monroe and Washtenaw counties, where funding remains low; and that enrolled acreage is significantly more variable in Hillsdale and Lenawee counties, where the majority of the funding has been directed since 1998 (Figure 8).



Above: Figure 7. Amount of EQIP and CSP program funding directed to each county to date by priority concern.

Left: Figure 8. Acreage enrolled in CRP in each county from 1998 to 2018.



State Program Enrollment and Performance

Data on program performance at the state level is not consistently nor widely available for the suite of Michigan-specific conservation programs. Further, the data that is available shows that some of these programs are sporadically applied across the state with varying degrees of success.

For example, MAEAP verifications cover an extremely low portion of agricultural acreage in the four target counties (Table 2.1). Despite low participation, the program has quantified key environmental outcomes as a result of the program's verification activities (Table 2.2). Similar information is not available for the four target counties

for other state-wide programs. MDARD does, however, publish an annual report describing program outcomes for the Farmland and Open Space Preservation Program, the most recent of which reported FY2018 outcomes.

The performance metrics described in that report include measures of productivity, tax credits issues, and acres enrolled. Per that report, the program issued an average of \$48 million in tax credits each year between 2014 and 2018. In that same time period, an average of 42,538 acres were enrolled during each program year.

Table 2.1. Proportion of Total Agricultural Acreage in Each County Verified by MAEAP

Conservation practice/County	Hillsdale	Lenawee	Monroe	Washtenaw
Nutrient plan or CNMP	1.28%	2.05%	0.94%	0.48%
Buffer/filter strips	0.01%	0.02%	0.02%	0.01%
Cover crops	0.32%	0.50%	0.21%	0.08%
Conservation tillage	0.51%	0.22%	0.45%	0.21%
No-till, zone till, or grass cover	0.71%	0.63%	0.33%	0.19%

Table 2.2. Environmental Outcomes in Each County Verified by MAEAP

Sediment reduced (tons)	19,386.21	31,160.17	14,340.76	7,305.16
Phosphorus reduced (lbs)	31,038.26	49,891.58	23,065.43	12,137.65
Nitrogen reduced (lbs)	62,071.48	99,773.65	46,524.72	26,285.40

Conservation Partnerships

Leveraging expertise, staff capacity, and additional resources is an essential component of implementing successful conservation programs at any scale. Much of this can be accomplished by engaging local conservation organizations and formal partnerships with narrowly defined missions to support the goals in a particular watershed.

Each of the five watersheds and four counties are home to formal, watershed or county-specific conservation partnerships. Most frequently, these organizations are known as watershed councils or soil and water conservation districts. These organizations are typically well organized, with a professional staff governed by a board of directors representing government agencies, academic institutions, private businesses, and non-governmental organizations. Watershed councils typically focus on issues related to water resources and land use whereas conservation districts address agricultural and natural resource concerns. Conservation organizations in the five watersheds and four counties include:

- Huron River Watershed Council
- Friends of the St. Joe River Watershed Council
- Kalamazoo River Watershed Council
- Friends of the Detroit River
- River Raisin Watershed Council
- Hillsdale Conservation District
- Lenawee Conservation District
- Monroe Conservation District
- Washtenaw County Conservation District

In some cases, formal conservation partnerships are established by government programs to support the implementation of specific initiatives. These partnerships are often led by state agencies, counties, or municipal organizations.

For example, the Regional Conservation Partnership Program has established three partnerships (listed below) in recent years to support work funded by the program.

- Michigan/Indiana St. Joseph River Watershed Conservation Partnership
- Tri-State Western Lake Erie Basin Partnership
- Huron River Initiative RCPP

There are also multiple membership-based, conservation-centered organizations that engage with and provide support to their members. This support often includes technical assistance, training, and networking opportunities. Such organizations fill an important role in connecting the similar but often disparate work happening across geographies. Additionally, these organizations can help consolidate and amplify political influence distributed among member organizations to contribute to policy-oriented outcomes on a larger scale. Examples of these types of organizations include the Michigan Association of Conservation Districts and the Michigan Water Environment Association. These organizations' membership includes local conservation districts and watershed councils as well as public and private-sector entities respectively.

Strengthening this network of organizations and initiatives serves to improve the region's capacity to identify opportunities, set priorities, compete for limited funding, and ultimately guide the implementation of focused conservation practices. Doing so requires a multilateral approach that cuts across levels of government, private firms, NGOs, and academic institutions.

In 2007, the Phosphorus Policy Advisory Committee issued its final report to the Michigan De-

partment of Environmental Quality (now called EGLE). The Advisory Committee comprised a diverse group of stakeholders representing the variety of sectors referenced above.

The purpose of the Advisory Committee “was to identify the major source categories of phosphorus loadings to Michigan’s surface waters, and for each of these categories, to review and compile the voluntary and regulatory management approaches that are being or could be used to control phosphorus.” Agriculture was identified as one of the major sources, citing risk factors such as soil erosion, cropland and pasture runoff, tile drained fields, CAFOs, and greenhouses. In its final report, the Advisory Committee set forth a comprehensive suite of recommendations that addressed:

- education and technical assistance;
- community education initiatives;
- incentives and voluntary programs;
- funding issues;
- monitoring, source identification, and loading analysis;
- land use development;
- phosphorus containing product changes;
- regulation; and,
- watershed initiatives.

Furthermore, the Michigan Department of Environment, Great Lakes, and Energy (EGLE) continues to represent the final report of the Advisory Committee as a special initiative which helped to establish Michigan’s Nutrient Framework to Reduce Phosphorus and Nitrogen Pollution. This framework is directly reflected in EGLE’s approach it takes to “set load-reduction goals for prioritized watersheds and reduce nutrient loadings through a combination of point-source and nonpoint source reduction activities.”

Perhaps more significantly, EGLE’s Nonpoint Source Program provides programming that addresses many of the recommendations described in the final report.

While this group had a short lifespan and was established with a uniquely narrow charge, it serves as an example of how a network of practitioners, advocates, and policymakers can be utilized to advance conservation goals by addressing myriad factors impacting conservation outcomes at every scale.

Further, the State of Michigan published its Domestic Action Plan (DAP) for Lake Erie in 2018 which affirms actions toward meeting the commitments and goals established by the Western Basin of Lake Erie Collaborative Agreement and Annex 4 of the Great Lakes Water Quality Agreement (GLQWA). Additionally, it describes the specific processes and tactics that the State will implement and pursue as collaborative action with “municipalities, nongovernmental organizations, other stakeholders” and the states bordering Lake Erie.

Specifically, the DAP identifies specific objectives for the State; actions to be taken or supported by the Michigan Department of Agriculture and Rural Development, MDEQ (now EGLE), and the Michigan Department of Natural Resources; program, policy and research gaps; and, an adaptive implementation strategy. Finally, it describes the processes through which the State will measure, track, and report progress toward meeting the identified objectives.

Conclusion

The findings published herein suggest that the intricacies of the agricultural sector - as they relate to implementing on-field conservation practices and the assistance often required to do



so - are further reflected by an intricate network of both publicly and privately funded programs which landowners, land managers, and farmers are compelled to navigate with varying degrees of success.

Understanding how information flows between key stakeholders; how participation in these programs are distributed among the target counties; and which instances of conservation spending result in the greatest ROI will inform how this complex network of programs, producers, and policymakers can shift their approach to improve outcomes on agricultural land.

As such, this assessment informs a subsequent phase of work in which the project team will conduct a feasibility assessment of how agricultural landowners might be more effectively incentivized to take action to further protect and apply conservation practices on working agricultural land.

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