

IOWA'S PATH TO CLEAN WATER AND FLOOD RESILIENT COMMUNITIES



A REPORT BY CODY SMITH,
CENTER FOR RURAL AFFAIRS



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October 2020

Iowa's Path to Clean Water and Flood Resilient Communities

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I. INTRODUCTION

As Iowans, water is central to each of our most basic activities, and, in our state, there is a lot of it. Across Iowa, there are 416 square miles of surface water, which 3,155,070 residents rely on for recreation, drinking water, agriculture, or other purposes.^{1,2} At the same time, Iowa ranks second in the U.S. for total agricultural production with \$27,535,876 in total cash receipts from all commodities.³ Simultaneously, as a result of human-induced climate change, total precipitation has increased by three inches over the last three decades in the state.⁴ On its own, ranking first in the nation for corn, egg, and hog production on the state's 30,622,731 acres of farmland is an impressive feat.^{5,6} Conversely, in totality, this mixture of agricultural superiority and an increasingly wet climate can spell trouble for the management of Iowa's water resources, especially as it relates to water quality and flood mitigation.

At all levels of government, there are opportunities to provide leadership in the management of water resources. Local governments can develop watershed management plans to guide action, collaboration, and success by coordinating with city, county, and other public entities to achieve water quality and flood reduction targets. State leaders can, and do, support programs and initiatives to respond to, prepare for, and improve the manage-

ment of water resources. Meanwhile, resources from the federal government can help amplify local and state efforts. However, greater strategy and emphasis on local involvement can provide a clear path to improved water quality and enhanced flood mitigation throughout Iowa's communities.

In June 2020, the Center for Rural Affairs conducted the "Our Iowa, Our Water Survey" to collect views of rural residents on the topics of flooding and water quality in the state and within their communities. The survey was mailed to 1,268 Iowans throughout the state's most rural state house districts. In addition, it was posted online and promoted to farmers, landowners, small business owners, and many others throughout rural Iowa. In total, the survey received 386 responses, including 143 from farmers or landowners, 23 from local elected officials, and 44 from small business employees or owners. See Figure 1 on page 2. The results have been summarized and will be featured throughout this paper.

A. IOWA'S WATER QUALITY CHALLENGE

Iowa's monocultural agriculture system is remarkably effective at controlling water for productivity. Subsurface tile drainage has allowed farmers to manage moisture in corn and soybean fields to achieve impressive crop yields. In fact, Iowa's average yield for corn and soybeans in 2019 was 198 bushels/acre and 55 bushels/acre, respectively.⁷ Much of this success can be attributed to the vast network of drainage infrastructure that rapidly whisks excess water away and quickly moves it down streams which have often been channelized to further improve efficiency. According to the 2017 U.S. Department of Agriculture's Census of Agriculture, about 53 percent of Iowa's cropland acres were tiled.⁸ See Figure 2 on page 2. This rapid removal of surface water from agricultural fields, which are rich with nutrient-dense soils and applied crop fertilizers, facilitates efficient machinery travel, seed germination, and disease resistance—leading to some of the highest crop yields in the U.S.

1 "How Wet is Your State? The Water Area of Each State." U.S. Geological Survey, usgs.gov/special-topic/water-science-school/science/how-wet-your-state-water-area-each-state?qt-science_center_objects=0#qt-science_center_objects. Accessed August 2020.

2 "QuickFacts: Iowa." U.S. Census Bureau, July 1, 2019, census.gov/quickfacts/IA. Accessed August 2020.

3 "Cash receipts by commodity, state ranking, 2019, nominal (current dollars)." U.S. Department of Agriculture Economic Research Service, Sept. 2, 2020, data.ers.usda.gov/reports.aspx?ID=17844. Accessed September 2020.

4 Schilling, Megan. "Midwestern Rain Events and Climate Change: Here's the Spring 2020 Outlook." Successful Farming, Feb. 5, 2020, agriculture.com/weather/future-conditions/midwestern-rain-events-and-climate-change. Accessed August 2020.

5 "Iowa's Rank in United States Agriculture." U.S. Department of Agriculture, National Agricultural Statistics Service, July 2019, nass.usda.gov/Statistics_by_State/Iowa/Publications/Rankings/IA-2019-Rankings.pdf. Accessed August 2020.

6 "Iowa Farm Facts." Living History Farms, 2020, lhf.org/learning-fields/crops/iowa-farm-facts/#:~:text=35.7%20million%3A%20Acres%20of%20land,devoted%20to%20cropland%20in%20Iowa. Accessed August 2020.

7 "Ag Decision Maker: Iowa Corn and Soybean County Yields." Iowa State University Extension and Outreach, March 2020, extension.iastate.edu/AGDm///crops/pdf/a1-14.pdf. Accessed August 2020.

8 Zulauf, Carl, and Ben Brown. "Use of Tile, 2017 U.S. Census of Agriculture." Department of Agricultural, Environmental and Development Economics, Ohio State University, Aug. 1, 2019, farmdocdaily.illinois.edu/2019/08/use-of-tile-2017-us-census-of-agriculture.html. Accessed August 2020.

FIGURE 1. OCCUPATIONS OF “OUR IOWA, OUR WATER SURVEY” RESPONDENTS

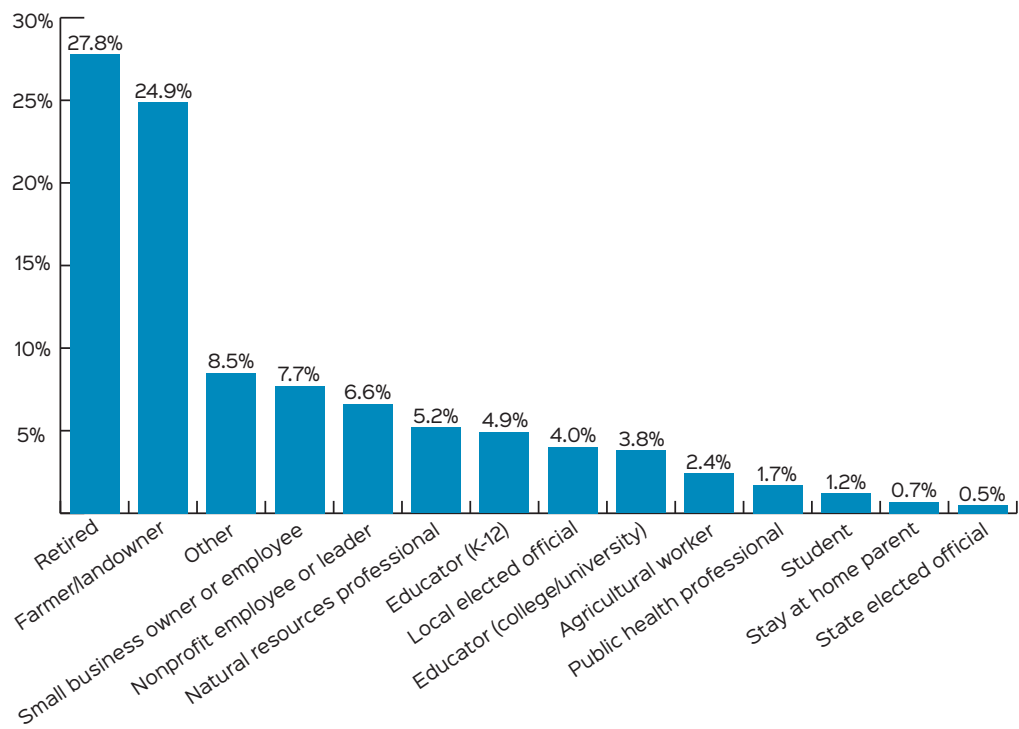


FIGURE 2. ACRES TILED AS A SHARE OF CROPLAND ACRES, U.S., 2017 (ROUNDED TO NEAREST PERCENT)

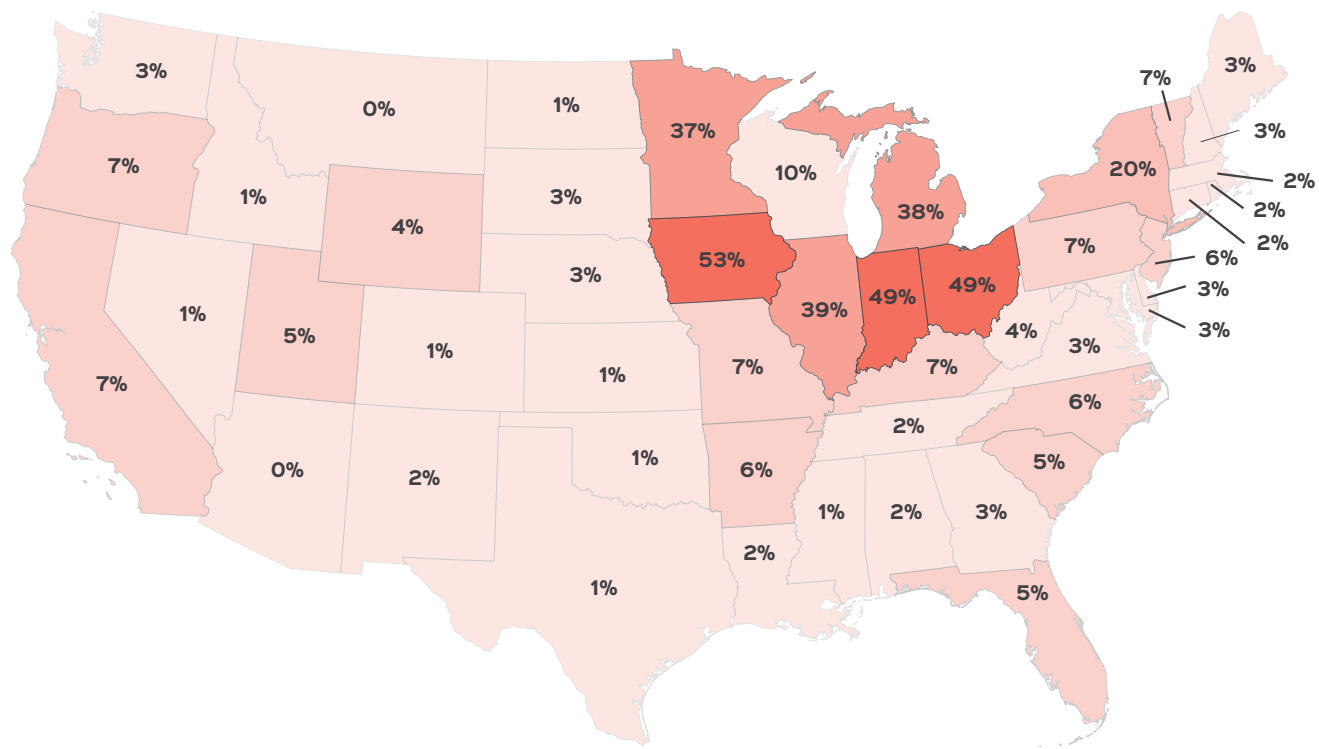


FIGURE 3. ARE YOU CONCERNED ABOUT THE QUALITY OF THE WATER IN LAKES, RIVERS, AND STREAMS IN THE STATE OF IOWA?

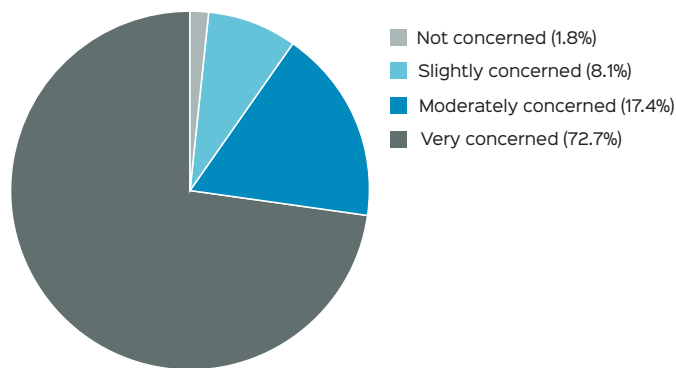
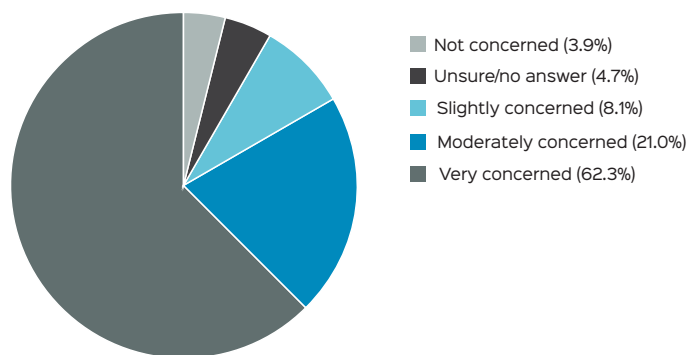


FIGURE 4. ARE YOU CONCERNED ABOUT THE QUALITY OF THE WATER IN THE LAKES, RIVERS, AND STREAMS IN YOUR COMMUNITY?



Consequently, this streamlined system of managing water for agricultural productivity enables the swift delivery of nutrients (i.e. nitrogen and phosphorus) to surrounding lakes, rivers, and streams.

Nutrient-laden water provides a suitable habitat for algae blooms, which are a form of cyanobacteria that emit toxic substances, such as microcystins, and exist on the surface of the water. This process is known as eutrophication. When active, algae pose a danger to the health of people, animals, and marine life by polluting the water with these toxins. When the algae decays, hypoxia, a process where decomposition consumes much of the available oxygen in the water and creates areas of low dissolved oxygen levels, occurs. Commonly referred to as “dead zones,” hypoxic areas of water have dissolved oxygen concentrations less than 2 to 3 mg/L.⁹ See Figures 3 and 4 for survey responses regarding water quality.

9 “Hypoxia 101: What is hypoxia and what causes it?” U.S. Environmental Protection Agency, Jan. 31, 2019, epa.gov/ms-htf/hypoxia-101#:~:text=Hypoxic%20waters%20have%20dissolved%20oxygen,to%20saline%20or%20temperature%20gradients. Accessed August 2020.

The nutrients leaching from Iowa’s farm fields contribute to a large dead zone in the Gulf of Mexico, at the estuary of the Mississippi River, which occupies between 6,000 and 7,000 square miles in any given year.¹⁰ In 2017, the Gulf of Mexico dead zone was 8,776 square miles—the size of New Jersey.¹¹ Though there are other contributors, such as municipal wastewater treatment facilities, industrial facilities, and lawn fertilizer, nonpoint agricultural pollution has been consistently identified as the primary source of nutrient pollution to the Mississippi River.¹² In fact, the National Water Quality Assessment shows nonpoint agricultural pollution as the number one source of impairment in rivers and streams across the U.S.¹³

This environmental challenge is not new. In 1997, the U.S. Environmental Protection Agency convened a Mississippi River/Gulf of Mexico Watershed Nutrient Task Force, more commonly known as the Hypoxia Task Force. Still in operation today, the group consists of the 12 states in the Mississippi River watershed and sets goals for improving water quality. Iowa, a member of the task force, responded to a 2008 call for state strategies to address nutrient loss into the river basin by beginning the process of drafting the Iowa Nutrient Reduction Strategy. Finalized in 2013, the Iowa Nutrient Reduction Strategy is a statewide goal to reduce the amount of nitrogen and phosphorus in Iowa’s waterways by 45 percent by 2035. The strategy, created through an interagency partnership and public input process led by the Iowa Department of Natural Resources, Iowa Department of Agriculture and Land Stewardship, and Iowa State University, steers much of the state’s water quality efforts and is expected to require billions in public investment to achieve its goals. Currently, state efforts to achieve the goals of the Iowa Nutrient

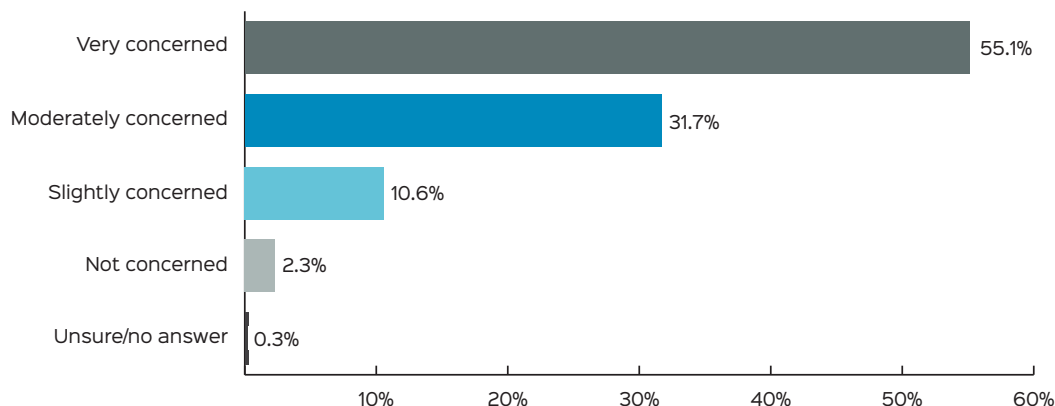
10 Bruckner, Monica. “The Gulf of Mexico Dead Zone.” Microbial Life Educational Resources, Montana State University, Oct. 15, 2019, serc.carleton.edu/microbelife/topics/deadzone/index.html#:~:text=The%20Gulf%20of%20Mexico%20dead%20zone%20is%20an%20area%20of,to%206%2C000%2D7%2C000%20square%20miles. Accessed August 2020.

11 Smith, Casey. “New Jersey-Size ‘Dead Zone’ Is Largest Ever in Gulf of Mexico.” National Geographic, Aug. 2, 2017, nationalgeographic.com/news/2017/08/gulf-mexico-hypoxia-water-quality-dead-zone/. Accessed August 2020.

12 “Trends in annual water-quality loads to the Gulf of Mexico.” U.S. Geological Survey, nrtwq.usgs.gov/mississippi_loads/#/GULF. Accessed August 2020.

13 “National Probable Sources Contributing to Impairments.” U.S. Environmental Protection Agency, ofmpub.epa.gov/waters10/attains_nation_cy.control#causes. Accessed June 2020.

FIGURE 5. ARE YOU CONCERNED ABOUT FLOODING IN THE STATE OF IOWA?



Reduction Strategy rely on a voluntary adoption approach. This means farmers, landowners, and other stakeholders are not required or compelled to install conservation practices through regulation, but rather through voluntary adoption.

B. IOWA LEADS THE NATION IN FLOODING DISASTERS

Iowa is no stranger to natural disasters, especially widespread flooding. Since the first one was issued in 1953, the state has had 70 federal disaster declarations.¹⁴ As of 2018, Iowa topped the list of states with the highest amount of disaster declarations as a result of flooding—even before the devastating spring floods of 2019.¹⁵ The floods in spring 2019 covered countless acres of farmland and ravaged several rural communities, like Hornick and Hamburg. In total, the 2019 floods caused an estimated \$1.6 billion in damage and led to a major disaster

declaration in 56 of 99 counties.^{16,17} In 2008, water from the Cedar River in Cedar Rapids reached 20 feet above flood stage, covered nearly 10 square miles of the city, displaced around 10,000 people, and led to more than \$800 million in federal disaster assistance.¹⁸ These disasters, tragic in outcome, have made it clear that Iowa faces a steep challenge in the management of water resources.

There are many factors which contribute to flooding, such as increased precipitation and changes in weather patterns as a result of human-induced climate change, but these challenges can also be attributed to the manipulation of natural systems to meet societal goals, such as draining farmland. For example, during a 30-year period at the beginning of the 20th century, approximately 1,000 miles

14 “Declared Disasters, Iowa.” Federal Emergency Management Agency, [fema.gov/disasters/disaster-declarations?field_dv2_state_territory_tribal_value=IA&field_year_value=All&field_dv2_declaration_type_value=All&field_dv2_incident_type_target_id=All](https://www.fema.gov/disasters/disaster-declarations?field_dv2_state_territory_tribal_value=IA&field_year_value=All&field_dv2_declaration_type_value=All&field_dv2_incident_type_target_id=All). Accessed September 2020.

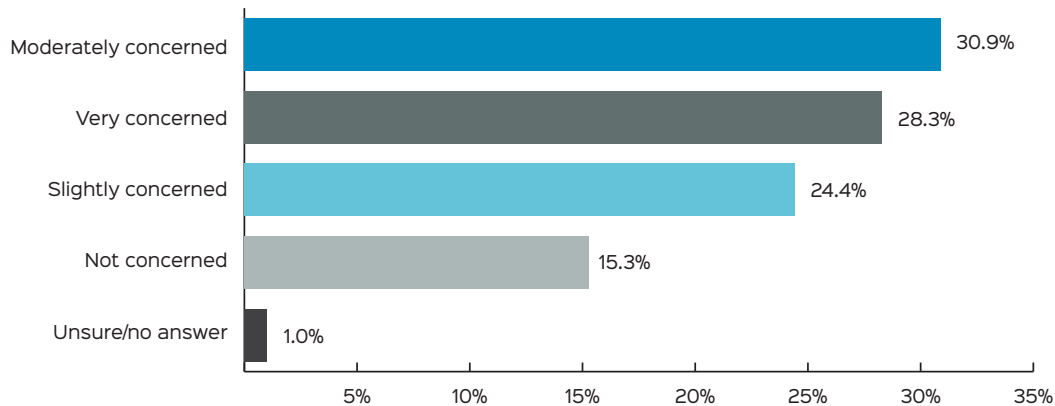
15 “Natural Disasters: Examining the National Impact from 1953 to 2018.” ADT, 2019, [adt.com/natural-disasters/declaration-analysis](https://www.adt.com/natural-disasters/declaration-analysis). Accessed August 2020.

16 Hardy, Kevin, and Austin Cannon. “Iowa flooding: Damage from floodwaters reaches \$1.6B, Gov. Kim Reynolds estimates.” *Des Moines Register*, March 22, 2019, [desmoinesregister.com/story/news/2019/03/22/iowa-flooding-damage-estimate-governor-kim-reynolds-federal-flood-relief-trump-nebraska-missouri/3232934002/](https://www.desmoinesregister.com/story/news/2019/03/22/iowa-flooding-damage-estimate-governor-kim-reynolds-federal-flood-relief-trump-nebraska-missouri/3232934002/). Accessed September 2020.

17 “President Trump approves major disaster declaration for 56 Iowa counties.” Office of the Governor of Iowa, Kim Reynolds, March 23, 2019, [governor.iowa.gov/2019/03/president-trump-approves-major-disaster-declaration-for-56-iowa-counties](https://www.governor.iowa.gov/2019/03/president-trump-approves-major-disaster-declaration-for-56-iowa-counties). Accessed August 2020.

18 “Cedar Rapids sees losses and gains from the flood of 2008.” KCRG-TV9, June 14, 2018, [kcrg.com/content/news/Cedar-Rapids-sees-losses-and-gains-from-the-flood-of-2008-485483511.html](https://www.kcrg.com/content/news/Cedar-Rapids-sees-losses-and-gains-from-the-flood-of-2008-485483511.html). Accessed August 2020.

FIGURE 6. ARE YOU CONCERNED ABOUT FLOODING IN YOUR COMMUNITY?



of rivers and streams were lost to channelization, leaving less than half of the state’s original miles of inland streams.¹⁹ Channelization refers to the process of straightening or redirecting natural streams in an artificially-modified or constructed stream bed.²⁰ An example can be found in the Missouri River, which used to span 5,000 to 10,000 feet wide and moved 2 mph in Sioux City, Iowa. Today, it spans only 740 feet and moves at 6 mph.²¹

While the channelization of natural river and stream ecosystems and subsurface tile drainage enabled the effective drainage of water for agricultural production and accelerated the removal of water, it has reinforced a system where man-made infrastructure

often dictates the characteristics of water bodies. Again, using the Missouri River as an example, some 8,300 control structures, such as wing dams and revetments, have been built in the river from Ponca, Nebraska, to the mouth of the river in Missouri.²²

This human-controlled infrastructure has allowed for greater development of valuable property, including agricultural land, city infrastructure, and interstate highways in the floodplain by managing the water in reservoirs and controlling releases through dams. However, this infrastructure was built for the meteorological conditions of a previous time. Many components of water resources infrastructure in Iowa are out of date, undermaintained, or unequipped to deal with current precipitation and weather patterns. Furthermore, as precipitation and weather variability increases as a result of human-induced climate change, these systems will continue to struggle as these different conditions become the new reality. As meteorological conditions continue to shift in favor of warmer and wetter climates, there are opportunities for local leaders to address the challenges associated with the management of water resources in Iowa. See Figures 5 and 6 for survey responses regarding flooding.

19 “Iowa’s Biological Communities: Iowa Waterways.” Iowa Association of Naturalists, Iowa State University Extension, September 2001, store.extension.iastate.edu/Product/Iowa-Waterways-Biological-Communities-PDF. Accessed August 2020.

20 “Stream channelization.” Encyclopedia.com, Aug. 28, 2020, encyclopedia.com/environment/encyclopedias-almanacs-transcripts-and-maps/stream-channelization#:~:text=Jun%2008%202020-,Stream%20channelization,agricultural%20use%2C%20and%20control%20flooding%20. Accessed August 2020.

21 Hyrtek, Nick. “The Mighty Mo: River has long, unruly history that management has yet to solve.” Lincoln Journal-Star, June 5, 2011, journalstar.com/news/state-and-regional/nebraska/the-mighty-mo-river-has-long-unruly-history-that-management-has-yet-to-solve/article_bc8468a5-20be-5d46-82d4-8545322e7243.html. Accessed September 2020.

22 Ibid.

II. LOCAL LEADERSHIP PROVIDES A PATH FORWARD

The perspective of local leadership is crucial for addressing these challenges. These leaders are on the front lines of these conditions and are personally invested in finding equitable solutions for their communities. Collaboration, intergovernmental cooperation, goal setting, and planning are among the available proven strategies for local jurisdictions to improve water quality and mitigate the impact of flooding in their communities. Robust planning at the watershed scale, strategic investments in staffing, and the allocation of public dollars can help put both rural and urban communities on the path to success. See Figures 7 and 8 for survey responses regarding flood risk decision making.

A. ENGAGING LOCAL STAKEHOLDERS TO PLAN AHEAD

People who live in communities impacted by poor water quality and widespread flooding also have an informed perspective of how these environmental externalities impact their quality of life. For example, residents of Hamburg, in Fremont County (population 6,993), experienced the floods of 2019 firsthand.²³ Leaders in the rural county worked with state leaders to secure more than \$15 million in flood recovery funds for residential buyouts, levy repairs, and other related relief efforts.²⁴ This crucial perspective helps state and federal leaders make informed decisions about the allocation of public resources for flood relief and preparedness.

In addition, this unmediated experience with flooding has helped inform locally-directed flood mitigation efforts. See Figure 9 on page 7 for survey responses regarding flooding at the local level.

Fremont County is a member of the West Nishnabotna Watershed Management Coalition, which is a watershed management authority (WMA) in southwest Iowa. A WMA is a Chapter 28E cooperative agreement among cities, counties, and soil and water conservation districts (SWCDs) that enables them to work collaboratively on watershed planning

FIGURE 7. WHO DO YOU TRUST MOST TO MAKE DECISIONS ABOUT MANAGING FLOOD RISK IN YOUR COMMUNITY?

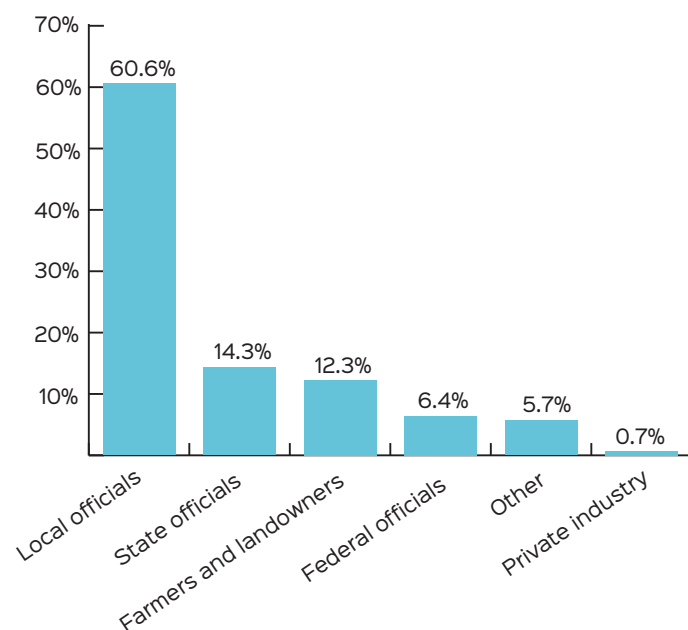
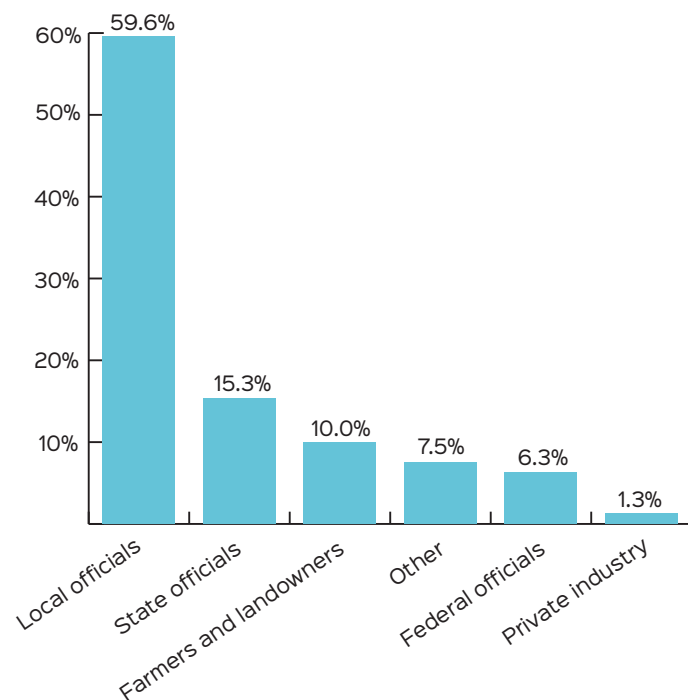


FIGURE 8. WHO DO YOU TRUST MOST TO MAKE DECISIONS ABOUT IMPROVING WATER QUALITY IN YOUR COMMUNITY?



23 "Population change rate, 2018-19." U.S. Department of Agriculture Economic Research Service, 2020, ers.usda.gov/data-products/atlas-of-rural-and-small-town-america/go-to-the-atlas/. Accessed August 2020.

24 "Hamburg awarded \$15 million for flood recovery." WOWT, Sept. 19, 2019, [wowt.com/content/news/Hamburg-awarded-15-million-for-flood-recovery-560806121.html](https://www.wowt.com/content/news/Hamburg-awarded-15-million-for-flood-recovery-560806121.html). Accessed August 2020.

and management within a Hydrologic Unit Code (HUC)-8 watershed. In more general practice, chapter 28E agreements are a type of intergovernmental partnership between two or more political subdivisions that have agreed to jointly exercise their powers in a cooperative manner.²⁵

One type of Chapter 28E agreement is a WMA, which was created in 2010 by the Iowa Legislature to:

- Assess the flood risks in the watershed.
- Assess the water quality in the watershed.
- Assess options for reducing flood risk and improving water quality in the watershed.
- Monitor federal flood risk planning and activities.
- Educate residents of the watershed area regarding water quality and flood risks.
- Allocate moneys made available to the authority for purposes of water quality and flood mitigation.
- Make and enter into contracts and agreements and execute all instruments necessary or incidental to the performance of the duties of the authority. A watershed management authority shall not acquire property by eminent domain. (Iowa Code 466B.23).²⁶

Statewide, several of the 26 existing WMAs are organized along the boundaries of smaller watersheds, such as the headwaters of the South Skunk River WMA (cluster of HUC-12s) and Squaw Creek WMA (HUC-10). See Figure 11 on page 8. WMAs offer a crucial way for stakeholders to develop partnerships that are not restricted by political boundaries, but instead are organized along the boundaries of the watershed. Securing funding is a key challenge for the widespread adoption of WMAs as they cannot levy any taxes and are reliant on grants and other financial contributions from their members. However, these locally-directed partnerships allow for meaningful engagement and input from crucial stakeholders, including farmers, landowners, homeowners, and small business owners, to help set goals for the watershed—including charting a path to cleaner water and more flood resilient communities.

FIGURE 9: DO YOU THINK POLICYMAKERS AT THE LOCAL LEVEL (COUNTY SUPERVISORS, CITY COUNCILS, ETC.) SHOULD DO MORE TO ADDRESS FLOODING IN YOUR COMMUNITY?

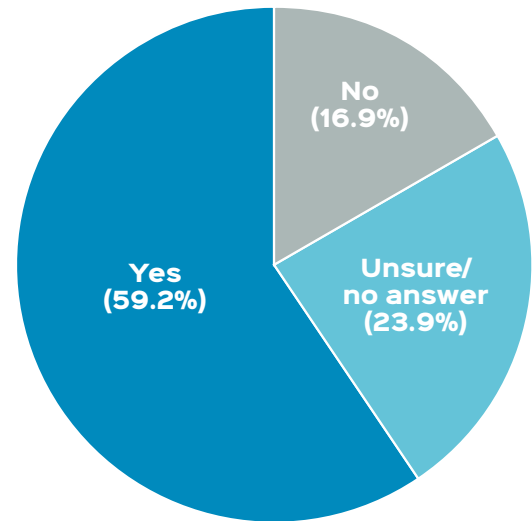
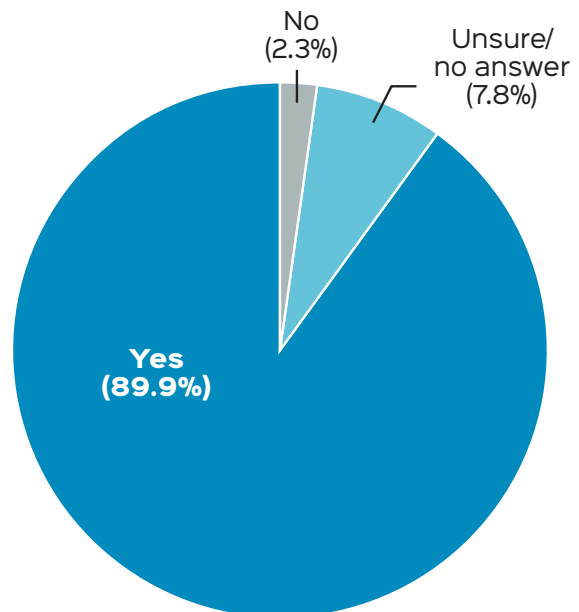


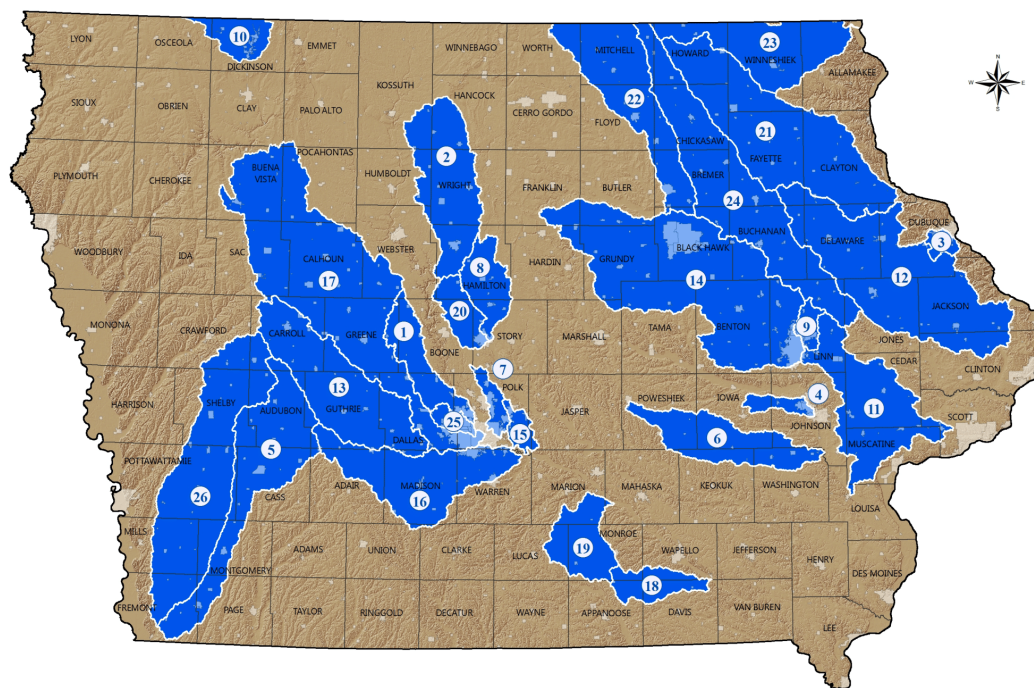
FIGURE 10: ARE YOU SUPPORTIVE OF EFFORTS TO DEVELOP LONG-TERM PLANS IN YOUR WATERSHED TO ADDRESS WATER QUALITY CONCERNS AND REDUCE FLOOD RISKS?



²⁵ “Chapter 28E Joint Exercise of Governmental Powers.” Iowa Code 2020, Dec. 5, 2019, legis.iowa.gov/docs/code/28E.pdf. Accessed August 2020.

²⁶ “Water Protection and Watershed Management.” Iowa Code 2020, Nov. 26, 2019, legis.iowa.gov/docs/code/466B.23.pdf. Accessed August 2020.

FIGURE 11. IOWA'S WATERSHED MANAGEMENT AUTHORITIES



- | | | | |
|---|---------------------------------------|--|--|
| 1. Beaver Creek WMA | 8. Headwaters of the South Skunk WMA | 15. Mud Creek, Spring Creek & Camp Creek WMA | 20. Squaw Creek WMA |
| 2. Boone River WMA | 9. Indian Creek WMA | 16. North Middle Rivers WMA | 21. Turkey River WMA |
| 3. Catfish River WMA | 10. Little Sioux Headwaters Coalition | 17. North Raccoon River Watershed Management Coalition | 22. Upper Cedar River WMA |
| 4. Clear Creek Watershed Coalition | 11. Lower Cedar WMA | 18. Soap Creek Watershed Board | 23. Upper Iowa River WMA |
| 5. East Nishnabotna Watershed Coalition | 12. Maquoketa River WMA | 19. South Central Iowa Cedar Creek WMA | 24. Upper Wapsipincon River WMA |
| 6. English River WMA | 13. Middle-South Raccoon WMA | | 25. Walnut Creek WMA |
| 7. Fourmile Creek | 14. Middle Cedar WMA | | 26. West Nishnabotna Watershed Coalition |

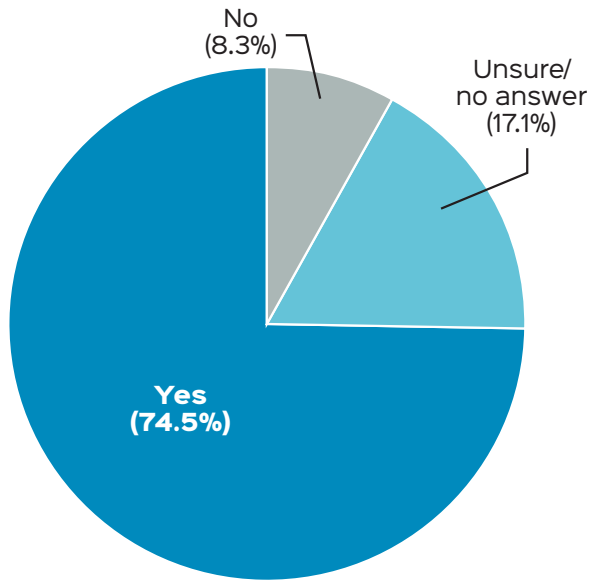
Of the state's 26 WMAs, at least 15 have developed watershed management plans. See Figure 10 on page 7 for survey responses regarding long-term watershed plans. A watershed management plan is a road map for reducing flood risk, improving water quality, assessing resource concerns, and outlining actionable steps that can be taken within a watershed to address these challenges. These plans also set important goals for nutrient reduction, conservation practice adoption, fund accumulation, and other metrics which steer progress and ensure accountability. In lieu of statewide water quality standards, these plans are crucial for setting measurable standards for both water quality and quantity, which can promote accountability. WMAs are well positioned to develop watershed management plans because they are completely voluntary partnerships that can bring together a diverse coalition of local stakeholders to gather input and feedback on proposed goals and plans of action. For example, the West Nishnabotna Watershed Management Coalition convened specific "focus groups" with farmers, landowners, city officials, and other

constituencies to make sure all perspectives were considered and implemented into their watershed management plan.²⁷

There is sufficient evidence from across Iowa that shows WMAs that work to adopt a watershed management plan achieve greater success. One success story comes from the Upper Iowa WMA where the Winneshiek County Engineer's Office collaborated with other WMA members to construct drainage ditches along roads as a water retention structure that reduces flood risk and improves water quality while still effectively meeting their drainage purpose. The road ditches essentially function as dams by being built at a greater height which allows for more water holding capacity. As a result, pollutants (i.e. nutrients) settle out before they are transported downstream. The culverts within the ditches are also designed to ensure they do not

²⁷ "West Nishnabotna River Watershed Management and Flood Resiliency Plan." West Nishnabotna Watershed Management Coalition, Iowa Watershed Approach, June 2019, goldenhillsrcd.org/uploads/4/5/6/3/45639541/west_nishnabotna_plan.pdf. Accessed August 2020.

FIGURE 12: DO YOU THINK POLICYMAKERS AT THE LOCAL LEVEL (COUNTY SUPERVISORS, CITY COUNCILS, SWCDS) SHOULD DIRECT MORE FINANCIAL RESOURCES TO HELP DEVELOP WATERSHED-FOCUSED PLANS TO REDUCE FLOODING AND IMPROVE WATER QUALITY IN YOUR COMMUNITY?



wash over in heavy rain events and cause infrastructure damage to the road.²⁸ A 2018 report from Iowa State University demonstrated a 60 percent reduction in nitrate levels in groundwater as a result of using roadside ditches for nutrient removal.²⁹ This successful practice was a result of partnerships formed through the Upper Iowa WMA and the work of their watershed coordinator.

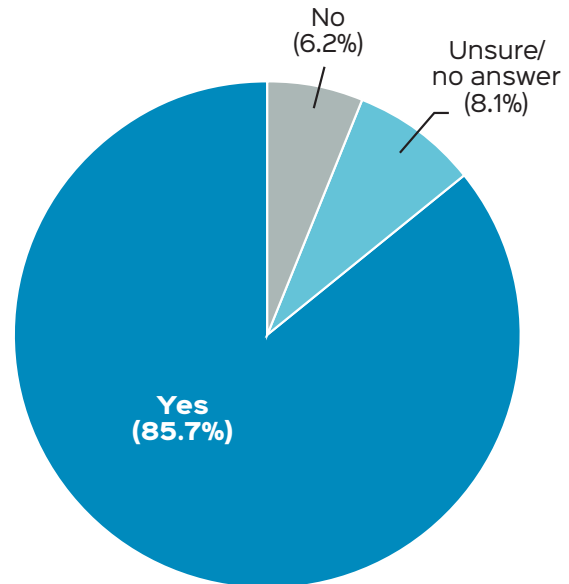
B. WATERSHED COORDINATORS PLAY A CRUCIAL ROLE

To successfully assess, manage, and improve the quality and quantity of water within a watershed, and achieve progress on the other priorities of a WMA, dedication of staff time and financial resources will be required. See Figures 12 and 13

28 Personal Communication with Matthew Frana, Upper Iowa River Watershed Management Authority coordinator, November 2019.

29 Schilling, Keith, et al. "Evaluating the Nutrient Processing Capacity of Roadside Ditches." Iowa State University College of Agriculture and Life Sciences, Iowa Nutrient Research Center, August 2016, cals.iastate.edu/inrc/projects/2016/evaluating-nutrient-processing-capacity-roadside-ditches. Accessed August 2020.

FIGURE 13: DO YOU THINK IOWA'S STATE OFFICIALS (STATE SENATORS, STATE REPRESENTATIVES, STATE AGENCIES) SHOULD DIRECT MORE FINANCIAL RESOURCES TO HELP DEVELOP WATERSHED-FOCUSED PLANS TO REDUCE FLOODING AND IMPROVE WATER QUALITY ACROSS THE STATE?



for related survey responses. This is especially true when facilitating engagement among stakeholders in a WMA. Watershed coordinators, as evidenced in the Upper Iowa WMA example, can achieve project implementation through facilitating stakeholder conversations. As demonstrated across the state, much of the success achieved by WMAs can be attributed to the diligent efforts and sustainable funding of a watershed coordinator. Watershed coordinators play a critical role in advancing the goals of watershed management plans and/or facilitating the creation of one.

Across the state's 26 WMAs, at least 18 watershed coordinators are employed by soil and water conservation districts, county and city governments, resource conservation and development organizations, or other nonprofit organizations. However, several WMAs either do not have a coordinator or a watershed management plan due to a lack of sustainable funding. This issue will likely grow as federal funds, which have driven the employment of at least nine watershed coordinators in WMAs, are set to expire in 2021.³⁰

30 "Iowa Watershed Approach: HUD Disaster Resilience Grant to Iowa: \$96.9 million." Iowa Watershed Approach, iowawatershedapproach.org/. Accessed August 2020.

The duties of a WMA coordinator vary by employing organization and each watershed management plan because they pursue locally-directed goals. However, many watershed coordinators play a crucial role in leading communication efforts with landowners and farmers about the implementation of flood control and water quality improvement practices. Securing grants and other sources of funding to perform the functions of a WMA is also a key role of a watershed coordinator. Other activities performed could include conducting regular meetings of the WMA, developing public outreach and education campaigns in the watershed, and connecting technical expertise with the goals of an established watershed management plan.

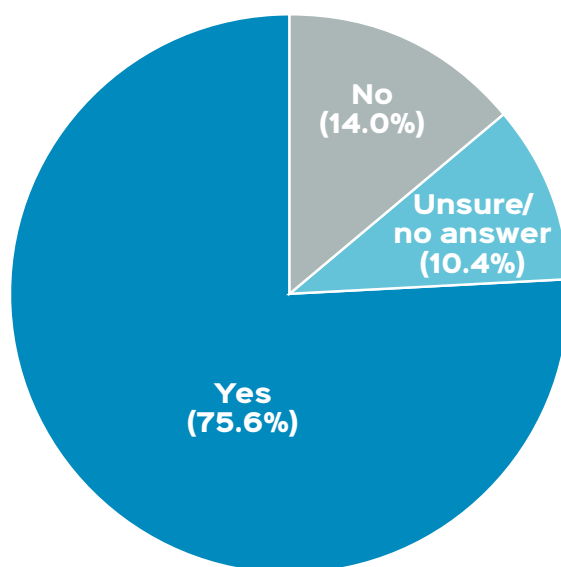
In short, watershed coordinators are key to the success of WMAs and the implementation of watershed management plans aimed at improving water quality and reducing flood risks. To meet the goals set forth in the Iowa Nutrient Reduction Strategy with the voluntary approach adopted by the state of Iowa, investments in watershed coordinators are non-negotiable. These natural resources professionals are on the front lines of securing the practices on the ground and are an investment in meeting any proposed flood reduction and water quality improvement targets.

III. STATE POLICY EFFORTS COULD BE STREAMLINED

Operating under the assumption that each of Iowa's 1,600 HUC-12 watersheds will require approximately \$3 million to achieve the goals of the Iowa Nutrient Reduction Strategy, total costs to address the state's water quality challenges are estimated to range from \$5 billion to \$9.6 billion.³¹ This price tag includes expenses associated with the installation of wetlands, prairie strips, cover crops, terraces, and countless other practices proven to reduce the loss of nutrients into waterways. Fortunately, practices that address water quality often yield some level of flood mitigation benefits as well. To respond to this environmental challenge, there is a need for substantial financial resources—prompting the state to implement a variety of programs to help mitigate the impact of any negative outcomes. Simultaneously, several opportunities exist to make new, more strategic public investments in improving water quality and reducing flood risk.

31 Personal Communication, Larry Weber, Iowa Flood Center at the University of Iowa, October 2019.

FIGURE 14. DO YOU SUPPORT A THREE-EIGHTHS-OF-ONE-CENT STATE SALES TAX INCREASE TO FUND NATURAL RESOURCES CONSERVATION AND OUTDOOR RECREATION PROJECTS?



A. NATURAL RESOURCES AND OUTDOOR RECREATION TRUST FUND

One potential opportunity for securing more money for the management of water resources in the state is the Natural Resources and Outdoor Recreation Trust Fund, also known as Iowa's Water and Land Legacy, or IWILL. This constitutionally-protected source of funding was passed by two consecutive general assemblies and finally adopted on the ballot in 2010 when 63 percent of Iowa voters approved the creation of IWILL. Unfortunately, the final step to allocate public dollars to IWILL has yet to be taken. To date, the fund sits empty because the Iowa Legislature has failed to raise the state's sales tax by three-eighths of one cent—foregoing more than \$1 billion for the conservation of our natural resources and promoting outdoor recreation since 2010.^{32,33}

32 Senate Study Bill 3116 suggests an annual funding amount of \$171.3 million for IWILL. Over 10 years, this would have generated \$1.713 billion for IWILL.

33 "Senate Study Bill 3116 - Introduced." The Iowa Legislature, Feb. 5, 2020, legis.iowa.gov/legislation/BillBook?ga=88&ba=ssb3116. Accessed August 2020.

TABLE 1. FUNDING REPLACEMENTS FOR THE IOWA DEPARTMENT OF NATURAL RESOURCES

Program name	General fund	Environment First Fund	Decrease in Gov. budget	Fiscal Year Decrease (replaced by IWILL)
Natural Resources Operations	X		\$2,479,029	\$4,958,058
Forestry Health Management	X		\$250,000	\$500,000
Park Operations and Maintenance		X	\$3,117,500	\$6,235,000
GIS Information for Watershed		X	\$97,500	\$195,000
Water Quality Monitoring		X	\$1,477,500	\$2,955,000
Water Quality Protection		X	\$250,000	\$500,000
Floodplain Management and Dam Safety		X	\$187,500	\$375,000
Iowa Resource Enhancement and Protection		X	\$6,000,000	\$12,000,000
Total	-\$5,458,058 GF	-\$22,260,000 EFF	-\$13,859,029 First Half	-\$27,718,058 Full Fiscal Year

B. INVEST IN IOWA ACT, SENATE FILE 512, AND RELATED PROGRAMS

In her 2020 Condition of the State Address, Gov. Kim Reynolds announced the Invest in Iowa Act, which would increase the state sales tax by 1 cent to reduce income taxes, fund mental health services, and fund the constitutionally-required three-eighths of one cent for IWILL.^{34,35,36} The proposal, expected to generate \$171.3 million annually for the Natural Resources and Outdoor Recreation Trust Fund, would provide \$100,146,262 in new funding each year for the seven separate accounts within the fund.

These accounts include:

- Soil conservation and nonpoint source water protection trust account;
- Watershed protection trust account;

34 Ibid.

35 “House Study Bill 657 - Introduced.” The Iowa Legislature, Feb. 6, 2020, legis.iowa.gov/legislation/BillBook?ba=HSB%20657&ga=88. Accessed September 2020.

36 “Gov. Reynolds Delivers Condition of the State.” Office of the Governor of Iowa, Kim Reynolds, Jan. 14, 2020, governor.iowa.gov/press-release/gov-reynolds-delivers-condition-of-the-state. Accessed August 2020.

- Local conservation partnership trust account;
- Water and land trails trust account;
- Lake and stream restoration trust account;
- Iowa Resource Enhancement and Protection (REAP) trust account; and
- Natural resources trust account.

There are notable differences in the usage of the funding allocated to each of the aforementioned accounts. The original IWILL formula would have been all new money for each of the accounts within the trust. Conversely, Gov. Reynolds’ proposal includes zeroing out several existing funding sources to the Iowa Department of Natural Resources, the Iowa Department of Agriculture and Land Stewardship, and the Iowa Department of Transportation and instead funding these agencies with IWILL money. Tables 1 (above), 2 (on page 12), and 3 (on page 12) spell out how a total of \$51,353,738 of existing state agency allocations and \$19,800,000 in other programs would be replaced by IWILL dollars each fiscal year. Importantly, the totals labeled “First half” represent the proposed cuts during the first half of the fiscal year.³⁷

37 “General Fund Recommendations.” The Iowa Legislature, Agriculture and Natural Resources Appropriations Subcommittee, legis.iowa.gov/docs/publications/SD/1127007.pdf. Accessed August 2020.

TABLE 2. FUNDING REPLACEMENTS FOR THE IOWA DEPARTMENT OF AGRICULTURE AND LAND STEWARDSHIP

Program name	General fund	Environment First Fund	Decrease in Gov. budget	Fiscal Year Decrease (replaced by IWILL)
Administrative division	X		\$1,667,840	\$3,335,680
Water Quality Initiative	X		\$1,500,000	\$3,000,000
Conservation Reserve Enhancement Program		X	\$500,000	\$1,000,000
Watershed Protection Fund		X	\$450,000	\$900,000
Soil and Water Conservation		X	\$1,900,000	\$3,800,000
Conservation Reserve Program		X	\$450,000	\$900,000
Cost share		X	\$4,162,500	\$8,325,000
Water Quality Initiative		X	\$1,187,500	\$2,375,000
Total	-\$6,335,680 GF	-\$17,300,000 EFF	\$11,817,840 First Half	\$23,635,680 Full Fiscal Year

TABLE 3. FUNDING REPLACEMENTS FOR THE REBUILD IOWA INFRASTRUCTURE FUND

Category and program name	Rebuild Iowa Infrastructure Fund	Decrease in Gov. budget	Fiscal Year Decrease (replaced by IWILL)
Iowa Department of Agriculture and Land Stewardship			
Iowa Water Quality Initiative	X	\$2,600,000	\$5,200,000
Natural Resources Capitals			
Lake Restoration and Water Quality	X	\$4,800,000	\$9,600,000
State Park Infrastructure	X	\$1,000,000	\$2,000,000
Iowa Department of Transportation			
Recreational Trails Grants	X	\$1,500,000	\$3,000,000
Total		-\$9,900,000 First Half	-\$19,800,000 Full Fiscal Year

TABLE 4. NET FISCAL IMPACT OF SENATE FILE 512 (IN MILLIONS)

Fiscal Year	General fund	Save	Lost	Rebuild Iowa Infrastructure Fund	Water Quality Infrastructure Fund	Water Quality Financial Assistance Fund
2019	\$0.0	-\$3.9	-\$3.0	\$0.0	\$2.0	\$2.0
2020	-\$4.0	-\$4.0	-\$3.0	\$0.0	\$4.0	\$4.0
2021	-\$8.2	-\$4.1	-\$3.1	-\$15.0	\$15.0	\$12.3
2022	-\$8.4	-\$4.2	-\$3.2	-\$15.0	\$15.0	\$12.6
2023	-\$8.6	-\$4.3	-\$3.3	-\$15.0	\$15.0	\$13.0
2024	-\$8.9	-\$4.4	-\$3.4	-\$15.0	\$15.0	\$13.3
2025	-\$9.1	-\$4.5	-\$3.5	-\$15.0	\$15.0	\$13.6
2026	-\$9.3	-\$4.7	-\$3.5	-\$15.0	\$15.0	\$14.0
2027	-\$9.6	-\$4.8	-\$3.6	-\$15.0	\$15.0	\$14.4
2028	-\$9.9	-\$4.9	-\$3.7	-\$15.0	\$15.0	\$14.8
2029	-\$10.1	-\$5.1	-\$3.9	-\$15.0	\$15.0	\$15.2
2030	-\$26.1	-\$5.2	-\$4.0	-\$0.0	\$0.0	\$0.0

Total decreases to existing funding by fiscal year are detailed under “Full Fiscal Year” headings. Lastly, Table 3 on page 12 outlines proposed replacements from the Rebuild Iowa Infrastructure Fund, a fund established in Iowa Code which is the primary funding source for public infrastructure-related expenditures.³⁸

Gov. Reynolds’ proposed Invest in Iowa Act would result in additional cuts to state natural resource activities. As a result of the way Senate File 512 was written, the Invest in Iowa Act would repeal the Water Service Excise Tax of 6 percent on the sale or furnishing of water, which is paid through consumer’s water utility bills. The Water Service Excise Tax is used to provide money to the state of Iowa’s Water Quality Infrastructure Fund and Water Quality Financial Assistance Fund, the latter of which furnishes dollars to the Wastewater And Drinking Water Treatment Financial Assistance Program, the Water Quality Financing Program Fund, and the Water Quality Urban Infrastructure

Fund. These funds were authorized by Senate File 512, which was passed in 2018 and finances both point source and nonpoint source water improvement programs.³⁹ Authorized to be in effect for 12 years, Senate File 512 is projected to provide more than \$270 million to water quality improvement projects over that time period.⁴⁰ Senate File 512 also includes a provision that repeals the Water Service Excise Tax on July 1, 2029, or in the instance the state sales tax was raised, whichever occurs first.⁴¹ By proposing to raise the state sales tax, the Invest in Iowa Act would move up this already-set sunset timeline by 10 years, eliminating this source of

39 “Gov. Reynolds signs Senate File 512 into law.” Office of the Governor of Iowa, Kim Reynolds, governor. [iowa.gov/bills/gov-reynolds-signs-senate-file-512-into-law#:~:text=Kim%20Reynolds%20signed%20the%20following,for%20cost%2Dshare%20programs%20for.](https://www.iowa.gov/bills/gov-reynolds-signs-senate-file-512-into-law#:~:text=Kim%20Reynolds%20signed%20the%20following,for%20cost%2Dshare%20programs%20for.) Accessed August 2020.

40 “Iowa Water Quality Initiative, 2019 Legislative Report.” Clean Water Iowa, legis.iowa.gov/docs/publications/SD/1038406.pdf. Accessed August 2020.

41 “Senate File 512.” Office of the Governor, The Iowa Legislature, Jan. 31, 2018, legis.iowa.gov/legislation/BillBook?ga=87&ba=SF512. Accessed August 2020.

38 “Rebuild Iowa Infrastructure Fund (RIIF).” Legislative Services Agency, January 2012, legis.iowa.gov/docs/publications/FTNO/14938.pdf. Accessed August 2020.

funding which currently serves as the state’s largest investment in water quality improvement efforts. See Figure 15 on Page 15 for survey responses regarding the 1 cent tax increase.

Senate File 512 also had a tremendous influence on the proposed funding allocation for the Natural Resources and Outdoor Recreation Trust Fund within the Invest in Iowa Act. See Table 4 on page 13.⁴² Compared to the original IWILL formula that was outlined ahead of the 2010 approval by Iowa voters, the governor’s proposed allocation formula is notably different—fluctuating by as much as 14 percent higher than the original formula for the soil conservation and nonpoint source water protection trust account.⁴³ This amounts to a \$23,982,000 increase to that account. See Table 5 on page 15.⁴⁴ In large part, this shift in the soil conservation and nonpoint source water protection trust account, as well as the percentage change of an additional 1 percent to the watershed protection account, are due to the Water Quality Infrastructure Fund and the Water Quality Financial Assistance Fund (both funds from Senate File 512) being folded into those two trust fund accounts, respectively.⁴⁵ A majority of this proposed shift in funding will flow to voluntary nonpoint source water quality improvement efforts. In particular, this would shift millions in funding to voluntary farm conservation and cost-share programs administered by the Iowa Department of Agriculture and Land Stewardship.

In total, shifting Iowa’s water quality and flood mitigation funding structure away from Senate File 512 and existing state programs to the proposed Invest in Iowa Act and setting all tax shifts to be effective on July 1, 2020, would have generated approximately \$1,370,400,000 in total money for natural

resources conservation and outdoor recreation projects over the next eight fiscal years.^{46,47,48,49}

Of that projected total over eight fiscal years, **\$801,170,096 would have been new, previously unavailable, funds.**^{50,51} Conversely, since the state has decided to continue the current funding structure of Senate File 512 and existing programs, only \$827,429,904 in total funding will be available for these projects and programs over the same time period.⁵² This is a remarkable difference of approximately \$542,970,096 in state funding for natural resources conservation and outdoor recreation projects that will not be generated over the next eight fiscal years.⁵³ See Figure 16 on page 15. These numbers are calculated using the assumption that the Invest in Iowa Act would generate the same \$171.3 million each fiscal year and each of the state’s existing programs would be funded at their fiscal year 2020 level.

46 Existing programs refers to the state programs that would be replaced with IWILL funding if Invest in Iowa were enacted. There are \$410,829,904 in proposed state agency funding replacements and \$158,400,000 in Rebuild Iowa Infrastructure Fund funding replacements over the next eight fiscal years (2021 to 2029).

47 “Fiscal Note, Fiscal Services Division. SF 512.” Legislative Services Agency serving the Iowa Legislature, legis.iowa.gov/docs/publications/FN/917568.pdf. Accessed August 2020.

48 “Senate Study Bill 3116 - Introduced.” The Iowa Legislature, Feb. 5, 2020, legis.iowa.gov/legislation/BillBook?ga=88&ba=ssb3116. Accessed September 2020.

49 “House Study Bill 657 - Introduced.” The Iowa Legislature, Feb. 6, 2020, legis.iowa.gov/legislation/BillBook?ba=HSB%20657&ga=88. Accessed September 2020.

50 The projected annual Natural Resources and Outdoor Recreation Trust Fund generation is \$171.3 million. Approximately, \$100,146,262 in new money would be generated each fiscal year with IWILL.

51 Smith, Cody. “Analysis: Our breakdown of Iowa’s IWILL proposal.” Center for Rural Affairs, Jan. 29, 2020, cfra.org/blog/analysis-our-breakdown-iowas-iwill-proposal. Accessed August 2020.

52 Senate File 512 has distributed \$12 million between its enactment and the end of fiscal year 2020. This leaves \$258.2 million to be distributed over the next eight fiscal years before the Water Service Excise Tax is repealed. This remaining amount is added to the \$569,229,904 in existing programs as defined above to reach \$827,429,904 in total expenditures under the existing Senate File 512 and state program structure.

53 The total fund generation for the Natural Resources and Outdoor Recreation Trust Fund in the Invest in Iowa Act over the next eight fiscal years (\$1,370,400,000) subtracted by the total funds generated from Senate File 512 and existing state programs (\$827,429,904).

42 “Fiscal Note, Fiscal Services Division. SF 512.” Legislative Services Agency serving the Iowa Legislature, legis.iowa.gov/docs/publications/FN/917568.pdf. Accessed August 2020.

43 “Senate Study Bill 3116 - Introduced.” The Iowa Legislature, Feb. 5, 2020, legis.iowa.gov/legislation/BillBook?ga=88&ba=ssb3116. Accessed August 2020.

44 Smith, Cody. “Analysis: Our breakdown of Iowa’s IWILL proposal.” Center for Rural Affairs, Jan. 29, 2020, cfra.org/blog/analysis-our-breakdown-iowas-iwill-proposal. Accessed August 2020.

45 “Senate Study Bill 3116 - Introduced.” The Iowa Legislature, Feb. 5, 2020, legis.iowa.gov/legislation/BillBook?ga=88&ba=ssb3116. Accessed August 2020.

TABLE 5. DIFFERENCE IN NATURAL RESOURCES AND OUTDOOR RECREATION TRUST FUND ALLOCATION FORMULA

IWILL account name	Existing formula	Proposed formula	Percent change	Funding amount existing formula (\$171.3 million total)	Funding amount proposed formula (\$171.3 million total)	Difference by proposal
Natural Resources	23%	18%	-5%	\$39,399,000	\$30,834,000	-\$8,565,000
Soil Conservation and Water Protection	20%	34%	+14%	\$34,260,000	\$58,242,000	+\$23,982,000
Watershed Protection	14%	15%	+1%	\$23,982,000	\$25,695,000	+\$1,713,000
Iowa Resource Enhancement and Protection	13%	10%	-3%	\$22,269,000	\$17,130,000	-\$5,139,000
Local Conservation Partnerships	13%	9%	-4%	\$22,269,000	\$15,417,000	-\$6,852,000
Trails	10%	4%	-6%	\$17,130,000	\$6,852,000	-\$10,278,000
Lake restoration	7%	10%	+3%	\$11,991,000	\$17,130,000	+\$5,139,000

FIGURE 16. DO YOU SUPPORT IOWA GOV. KIM REYNOLDS' "INVEST IN IOWA" (IWILL) PROPOSAL TO RAISE THE STATE SALES TAX BY 1 CENT TO FUND NATURAL RESOURCES CONSERVATION AND OUTDOOR RECREATION PROJECTS, REDUCE INCOME TAXES, AND FUND MENTAL HEALTH SERVICES IN IOWA?

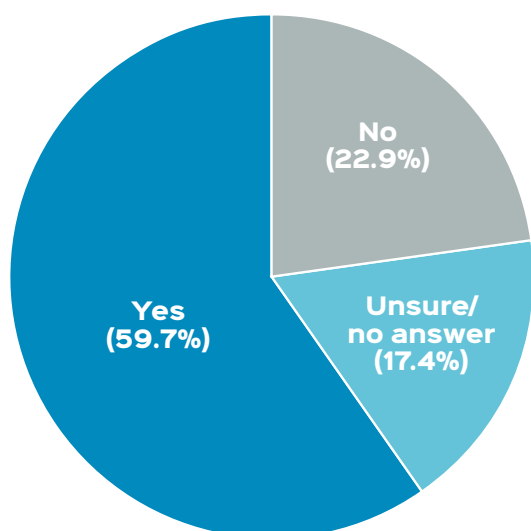


FIGURE 15: TOTAL MONEY OVER EIGHT FISCAL YEARS BY FUNDING STRUCTURE

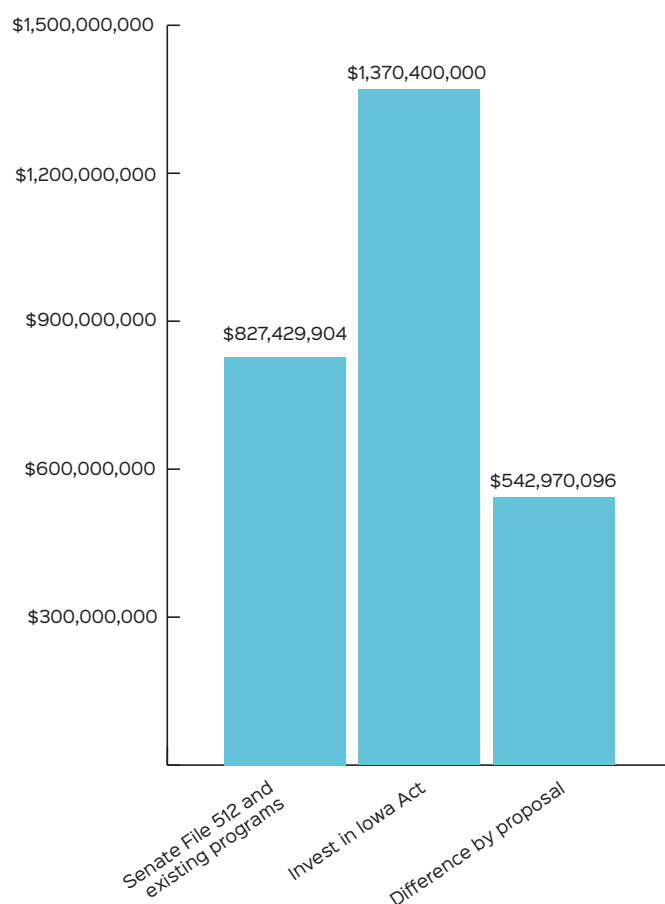


TABLE 6. PROPOSED MATCHING REQUIREMENTS IN LOCAL CONSERVATION PARTNERSHIP PROGRAM

Percent cost share from state	Percent local match required	Population of county
90%	10%	15,000 or less
75%	25%	15,001 to 99,999
25%	75%	100,000 or more

C. STRATEGIC INVESTMENTS COULD ACCELERATE PROGRESS

Supporting WMAs and watershed-focused efforts would accelerate the progress of achieving Iowa’s water quality goals while also reducing flooding. In addition to the new funding which would have been generated by the Invest in Iowa Act, a new state program to support these efforts would have been created. The Local Conservation Partnership Program would be a new initiative within the local conservation partnerships trust account that would authorize the Iowa Department of Natural Resources to provide financing to local communities and WMAs. The program would provide funds to maintain and improve parks, preserves, wildlife areas and habitats, native prairies, forests, and wetlands. In addition, the program would be authorized to provide funds for locally-directed projects to promote wildlife diversity, further recreational opportunities, improve rivers and streams, and sponsor education and outreach programs. The program also has a proposed cost-share rate for these activities for eligible entities, this is based on local population size. See Table 6.

Within the Invest in Iowa Act, the Local Conservation Partnership Program would be allocated 9 percent of all trust fund monies, or about \$15,417,000 a year. These dollars could help scale up watershed improvement efforts, including long-term watershed planning and project implementation, which are locally-directed by WMAs—putting Iowa’s communities in the driver’s seat when addressing these important challenges.

Unique to WMAs is the ability to bring together multiple sources of funding with different goals to achieve the greatest possible return on investment for Iowa taxpayers. For example, WMAs are

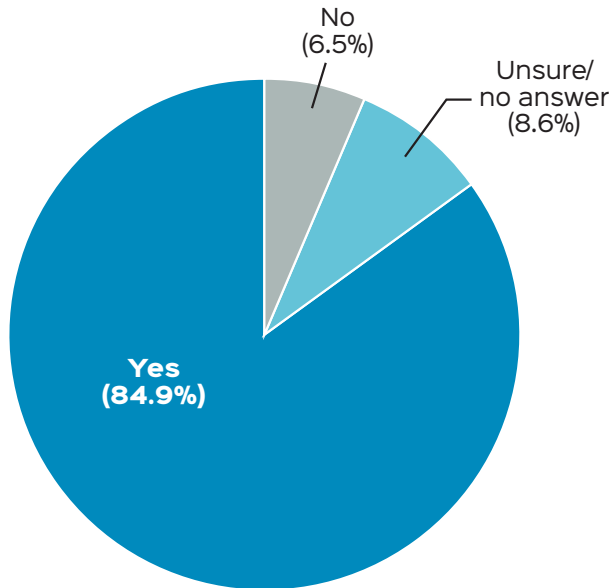
well positioned to bring in funds from the Water Quality Initiative through the Iowa Department of Agriculture and Land Stewardship as well as Section 303(d) funding through the Iowa Department of Natural Resources and direct them to the areas of the watershed where funds will have the greatest impact on water quality. The Water Quality Initiative is the state program aimed at meeting the goals of the Iowa Nutrient Reduction Strategy.⁵⁴ The Section 303(d) funding originates from the Clean Water Act and is intended to improve Iowa’s federally-listed impaired waterways to meet their designated uses such as drinking water or fishing—sometimes these are two very different goals.⁵⁵

Sustainable funding for watershed coordinators in WMAs remains a barrier to this approach. Though not explicitly listed, nor forbidden, as an eligible expense, stable funding for watershed coordinators is considered to be an acceptable expenditure under the Local Conservation Partnership Program. A final decision on this will likely be deciphered in the Iowa Department of Natural Resources’ rulemaking process upon enactment of the Invest in Iowa Act. Sustainable funding for watershed coordinators is one of the key barriers to success in scaling up voluntary adoption of both water quality and flood mitigation projects. Watershed coordinators play a crucial role in facilitating communication with participating landowners, but often experience elevated levels of turnover due to a lack of sustainable, multi-year funding for their positions as well as inadequate or unavailable benefits, such as health insurance. The Local Conservation Partnership Program, as well as other Invest in Iowa Act Programs, would go a long way in helping put more water quality and flood mitigation practices on the ground by investing in the staff that is required to achieve these goals.

54 “Water Quality Initiative.” Clean Water Iowa, cleanwateriowa.org/water-quality-initiative. Accessed August 2020.

55 “Iowa’s Section 303(d) Impaired Waters Listings.” Iowa Department of Natural Resources, iowadnr.gov/environmental-protection/water-quality/water-monitoring/impaired-waters. Accessed August 2020.

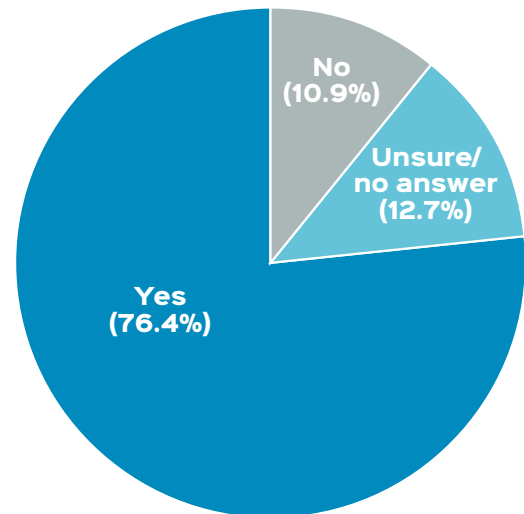
FIGURE 17. DO YOU THINK FEDERAL OFFICIALS (U.S. SENATORS, U.S. REPRESENTATIVES, FEDERAL AGENCIES) SHOULD DIRECT MORE FINANCIAL RESOURCES TO HELP DEVELOP WATERSHED-FOCUSED PLANS AIMED AT REDUCING FLOODING AND IMPROVING WATER QUALITY ACROSS THE STATE?



IV. FEDERAL PROGRAMS SUPPORT PROGRESS

Finally, federal conservation programs authorized in the farm bill can play a large role in helping Iowa meet its water quality and flood reduction goals. These programs include the Conservation Stewardship Program (CSP), the Environmental Quality Incentives Program (EQIP), the Conservation Reserve Program (CRP), and the Agricultural Conservation Easement Program (ACEP). Each offers valuable financial cost share to individual farmers and landowners for the voluntary installation of conservation practices, which often also yield flood reduction benefits. Simultaneously, other federal programs can support Iowa's water quality and flood reduction goals: in 2016, the U.S. Department of Housing and Urban Development provided a \$97 million Disaster Resilience Grant to the state, which has supported a multi-year, multi-watershed effort called the Iowa Watershed Approach to address flooding. See Figures 17 and 18 for survey responses regarding federal programs.

FIGURE 18. DO YOU THINK THERE SHOULD BE INCREASED PUBLIC FUNDING OF FEDERAL WORKING LANDS CONSERVATION PROGRAMS TO HELP FARMERS INVEST IN CONSERVATION? (CONSERVATION STEWARDSHIP PROGRAM AND THE ENVIRONMENTAL QUALITY INCENTIVES PROGRAM)



A. CONSERVATION PROGRAMS CONTRIBUTE TO SUCCESS

The U.S. Department of Agriculture (USDA) administers the voluntary conservation programs of CSP, EQIP, CRP, and ACEP. Farmers and landowners learn about and apply to enroll in these programs by working with their local USDA office through annual or semiannual sign-up periods.

These programs offer several options for increasing conservation at the farm level. Both CSP and EQIP are working lands conservation programs that support measures to increase conservation efforts on farms. EQIP supports specific practices, while CSP rewards ongoing conservation and supports a whole-farm approach to conservation. CRP offers rental payments for removing land, including marginal land, from production, generally under 10- or 15-year contracts. ACEP is USDA's permanent easement program, with options for wetland or agricultural easements.

1. CONSERVATION STEWARDSHIP PROGRAM

CSP allows farmers who are already practicing conservation on their land to increase that level of conservation through five-year contracts. Farmers work with their local USDA offices to select the conservation measures they will take on over the five years, and which natural resource concerns—such as soil quality and water quality—those measures will address. Examples of conservation measures that CSP will support include improved rotational grazing practices, resource-conserving crop rotations, and cover crops. Often, a conservation measure will offer multiple benefits. For example, cover crops have been shown to reduce nitrogen loss by 31 percent and phosphorus loss by 29 percent, as well as improve soil water holding capacity by adding organic matter.⁵⁶ For context, a 1 percent increase in organic matter in the top 6 inches of soil on 1 acre can allow the land to hold an additional 27,000 gallons of water, helping build resiliency against flooding.⁵⁷ In 2018, more than 8,000 acres of cover crops were planted in Iowa under CSP contracts.

In 2019, 412 farmers entered into a CSP contract in Iowa, which totaled 118,739 acres and were supported by \$16.3 million in payments to farmers.

2. ENVIRONMENTAL QUALITY INCENTIVES PROGRAM

EQIP is also a working lands conservation program that provides financial and technical assistance to agricultural producers to address natural resources concerns on their land.⁵⁸ Unlike the comprehensive approach to conservation that CSP offers, EQIP offers farmers the chance to begin or install individual conservation practices. The program supports practices that improve water and air quality, conserve ground and surface water, increase soil health, reduce soil erosion and sedimentation, improve or create wildlife habitat, and mitigate against increasing weather volatility.⁵⁹

56 “Cover Crops.” Clean Water Iowa, cleanwateriowa.org/cover-crops. Accessed August 2020.

57 Machmuller, Megan B., et al. “Emerging land use practices rapidly increase soil organic matter.” *Nature Communications*, April 30, 2015, nature.com/articles/ncomms7995. Accessed June 2020.

58 “Environmental Quality Incentives Program.” U.S. Department of Agriculture, Natural Resources Conservation Service, nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/eqip/. Accessed August 2020.

59 Ibid.

One example of a practice that enhances water quality and that EQIP can support is a saturated buffer, which reduces nitrogen loss by 91 percent and phosphorus up to 20 percent in water running off of farm fields.^{60,61} At the same time, saturated buffers can offer up to a 5 percent peak streamflow reduction after heavy rain events and retain water between four to eight hours within itself.⁶²

Across Iowa, EQIP’s 1,438 contracts covered more than 197,000 acres and paid more than \$36.6 million to farmers in 2019 alone.⁶³

3. CONSERVATION RESERVE PROGRAM

CRP is a conservation program administered by the USDA’s Farm Service Agency that pays farmers an annual rental rate for removing environmentally-sensitive land from agricultural production and instead planting it with vegetation that improves water quality, soil health, and wildlife habitat.⁶⁴ The contracts, 10 to 15 years in length, pay land managers to adopt long-term conservation practices that achieve crucial environmental outcomes. Available conservation practices under CRP range from tree plantings to grassed waterways, shelterbelts to riparian buffers. These practices can allow for substantial improvements in water

60 Schulte, Lisa A., et al. “Prairie strips improve biodiversity and the delivery of multiple ecosystem services from corn-soybean croplands.” *Proceedings of the National Academy of Sciences of the United States of America*, Oct. 17, 2017, pnas.org/content/114/42/11247.short. Accessed August 2020.

61 Jaynes, D.B. and T.M. Isenhardt. “Reconnecting Tile Drainage to Riparian Buffer Hydrology for Enhanced Nitrate Removal.” *Journal of Environmental Quality*, March 2014, researchgate.net/publication/271333770_Reconnecting_Tile_Drainage_to_Riparian_Buffer_Hydrology_for_Enhanced_Nitrate_Removal. Accessed August 2020.

62 “Flood Resilience Program.” Iowa Watershed Approach, iowawatershedapproach.org/programs/resilience/. Accessed August 2020.

63 Simon, Kurt. “At-a-Glance, Iowa Natural Resources Conservation Service, Fiscal Year 2019.” U.S. Department of Agriculture, nrcs.usda.gov/wps/cmismis_proxy/https://ecm.nrcs.usda.gov%3A443/fncmis/resources/WEBP/ContentStream/idd_A0998E6E-0000-CB17-BCFF-35CA8D1A225F/0/2019At-A-Glance.pdf. Accessed August 2020.

64 “Conservation Reserve Program.” U.S. Department of Agriculture Farm Service Agency, fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-program/index. Accessed August 2020.

quality by reducing soil erosion and nutrient loss to water bodies—simultaneously offering flood reduction benefits. In fact, perennial vegetation has been shown to reduce peak streamflows by up to 40 percent.⁶⁵

CRP offers multiple sign-up opportunities, some which support conservation and water quality explicitly. Continuous CRP, for example, allows landowners to enroll marginal land that is not suitable for agricultural production. In addition, as a sub-signup under Continuous CRP, the USDA has begun CRP-CLEAR (for Clean Lakes, Estuaries, and Rivers), a pilot initiative available in 2020 in the Chesapeake Bay and Great Lakes regions. CRP-CLEAR offers landowners 30-year CRP contracts designed to decrease erosion, improve water quality, increase wildlife habitat, and engage in longer-term conservation. There is no indication yet whether USDA will expand this pilot and make it available in Iowa.

Across Iowa, more than 253,000 acres were enrolled in CRP as of February 2020.

4. AGRICULTURAL CONSERVATION EASEMENT PROGRAM

ACEP exists to help protect, restore, and enhance wetlands, grasslands, and working farms and ranches through conservation easements.⁶⁶ Through the Wetlands Reserve Easements component of the program, Natural Resources Conservation Service focuses their efforts specifically on wetlands. Wetlands are an effective practice for improving water quality as they reduce nitrate loss by 52 percent and can reduce peak streamflow by 10 to 20 percent following a storm event.^{67,68}

65 “Flood Resilience Program.” Iowa Watershed Approach, iowawatershedapproach.org/programs/resilience/. Accessed August 2020.

66 Simon, Kurt. “At-a-Glance, Iowa Natural Resources Conservation Service, Fiscal Year 2019.” U.S. Department of Agriculture, nrcs.usda.gov/wps/cmismis_proxy/https://ecm.nrcs.usda.gov%3A443/fncmis/resources/WEBP/ContentStream/idd_A0998E6E-0000-CB17-BCFF-35CA8D1A225F/0/2019At-A-Glance.pdf. Accessed August 2020.

67 “Wetlands.” Clean Water Iowa, cleanwateriowa.org/wetlands. Accessed August 2020.

68 “Flood Resilience Program.” Iowa Watershed Approach, iowawatershedapproach.org/programs/resilience/. Accessed August 2020.

In 2019, ACEP operated on 1,666 acres through 13 easements with land managers in Iowa. Through those easements alone, about \$9.4 million went to eligible practices within the state.⁶⁹

Federal farm conservation programs provide Iowa’s farmers and landowners with considerable financial resources to address key environmental challenges, such as soil erosion, nutrient loss, and manure management. These dollars are a key pillar of meeting the goals of the Iowa Nutrient Reduction Strategy. However, these federal programs are almost entirely dependent upon the voluntary actions of farmers and/or landowners, which can leave farms in high priority, environmentally-sensitive areas of a watershed without needed action. Watershed coordinators in WMAs, when sustainably resourced, can help bridge these gaps in program use and practice adoption by facilitating communication with farmers and landowners while using watershed management plans as a road map for outreach. Working in partnership, USDA service centers, soil and water conservation districts, and watershed coordinators can work to inform one another’s efforts to achieve the greatest return on public investment when pursuing watershed improvement.

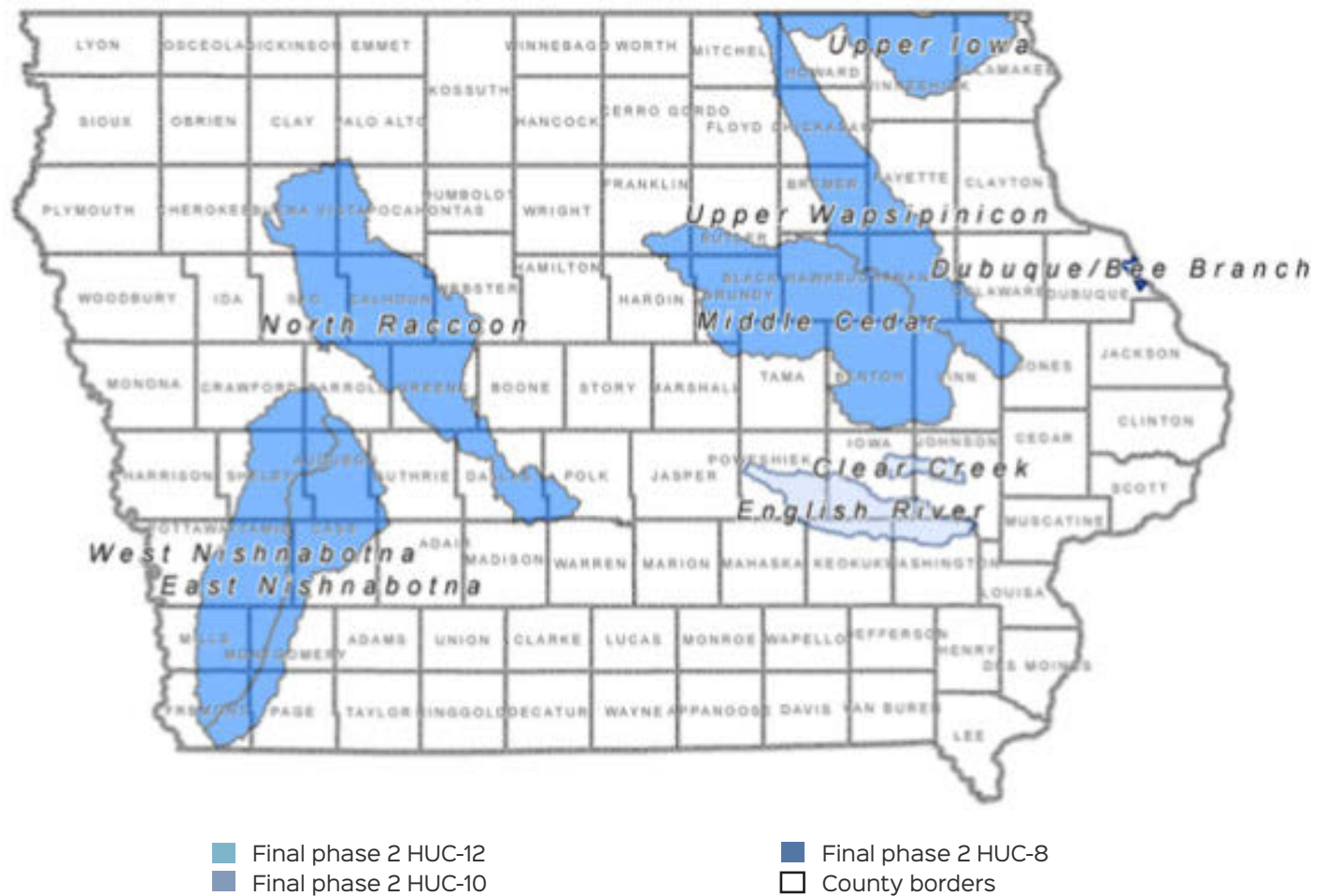
B. SPOTLIGHT: IOWA WATERSHED APPROACH

In 2016, the U.S. Department of Housing and Urban Development announced more than \$97 million dollars in funding for resilient infrastructure and housing projects to the state of Iowa.⁷⁰ The funding was awarded for the Iowa Watershed Approach project which is a holistic watershed-scale program that brings together local, state, federal, and private organizations to work together to address factors that contribute to floods and nutrient flows in select watersheds. See Figure 19 on page 20.

69 Simon, Kurt. “At-a-Glance, Iowa Natural Resources Conservation Service, Fiscal Year 2019.” U.S. Department of Agriculture, nrcs.usda.gov/wps/cmismis_proxy/https://ecm.nrcs.usda.gov%3A443/fncmis/resources/WEBP/ContentStream/idd_A0998E6E-0000-CB17-BCFF-35CA8D1A225F/0/2019At-A-Glance.pdf. Accessed August 2020.

70 “HUD Awards \$1 Billion Through National Disaster Resilience Competition: State of Iowa to receive \$96M for resilient infrastructure and housing projects.” U.S. Department of Housing and Urban Development, Jan. 21, 2016, iowawatershedapproach.iowa.gov/docs/AWARD_NDRC_HUD_Release_012116.pdf. Accessed August 2020.

FIGURE 19. MAP OF WATERSHEDS IN THE IOWA WATERSHED APPROACH PROJECT



The goals of the project, which is led by the Iowa Department of Homeland Security and Emergency Management, the Iowa Flood Center at the University of Iowa, and several other partners include:

- Reduce flood risk;
- Improve water quality;
- Increase resilience;
- Engage stakeholders through collaboration and outreach/education;
- Improve quality of life and health, especially for vulnerable populations; and
- Develop a program that is scalable and replicable throughout the Midwest and the U.S.⁷¹

Housing and Urban Development funds have been used to enable the formation of WMAs in nine watersheds including the Bee Branch (Dubuque), Clear Creek, East Nishnabotna, English River, Middle Cedar, North Raccoon, Upper Iowa, Upper Wapsipinicon, and West Nishnabotna. The funding has also helped conduct hydrological assessments, develop robust watershed management plans in those watersheds, and fund the stable employment of watershed coordinators. This funding has allowed for the creation of watershed management plans and facilitated their implementation on a scale that is not easily attainable at the state level. Unfortunately, funding for this project will expire in September 2021, prompting a situation where state lawmakers can act to support these demonstrably-successful efforts.

71 "Iowa Watershed Approach: HUD Disaster Resilience Grant to Iowa: \$96.9 million." Iowa Watershed Approach, iowawatershedapproach.org/. Accessed August 2020.

V. CONCLUSION

In total, Iowa's path to clean water and flood resilient communities is locally-directed, state-supported, and reinforced by federal resources. Leveraging the input of local leaders through WMAs and in-depth planning for water quality improvements and flood mitigation at the watershed scale offer a proven and well-informed strategy to meet the state's adopted goals. Farmers, landowners, small business owners, and homeowners each have unique insight into how the management of water resources impacts their communities, and this perspective should be included in long-term watershed plans to improve conditions in the state. A majority of Iowans have shown that they trust local officials to make decisions about managing flood risks and improving water quality in their communities. As the state continues to pursue a voluntary approach to water quality improvement, this relationship of trust will prove to be instrumental to meeting those targets.

About the Center for Rural Affairs

Established in 1973, the Center for Rural Affairs is a private, nonprofit organization with a mission to establish strong rural communities, social and economic justice, environmental stewardship, and genuine opportunity for all while engaging people in decisions that affect the quality of their lives and the future of their communities.

