

Iowa Watershed Approach: Year 2 Evaluation Activities Executive Summary

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Submitted to:

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Introduction

The Year 2 program evaluation of the *Iowa Watershed Approach (IWA)* was conducted by the Center for Evaluation and Assessment (CEA). The CEA is a Board of Regents approved, independent center in existence under its charter since 1992. The CEA staff drafted all evaluation designs and instrumentation, shared the drafts with the IWA Principal Investigator and/or selected project staff, partners, and stakeholders for suggested revisions, and revised as needed. At all times, significant groups of stakeholders, including the project partners, had the opportunity to comment on evaluation materials and approaches. The IWA program evaluation is informed by *The Program Evaluation Standards: A Guide for Evaluators and Evaluation Users, 3rd Edition (2011)*.¹ All surveys and interviews conducted by the CEA were reviewed by the University of Iowa Human Subjects Office.

The focuses for the IWA evaluation in Year 2 continued to be on process monitoring and providing timely formative information for project improvement. During Year 2, the CEA followed the evaluation plan prepared in collaboration with the IWA. The CEA also followed the plan developed for the Bee Branch Healthy Homes Project (BBHH). After programmatic changes occurred for the Flood Resilience Team (FRT), in March 2018, the CEA revised the evaluation plan to align with their current plan. The evaluation methods consisted of participant observation in project meetings and meetings of affiliate groups; conducting surveys of IWA partners, Watershed Management Authority (WMA) meeting attendees, IWA planning entities for the WMAs, and IWA project coordinators (PCs) and conducting interviews with BBHH staff and BBHH clients. The CEA provided project staff with quick turnaround reports of survey and interview findings for their formative use. In addition, the CEA contacted project staff with informal feedback about potential concerns.

IWA Year 2 Context

During Year 2, several contextual factors played out in Iowa that could have unknown effects on the success of the IWA. One factor, often cited as a concern by WMA meeting attendees and IWA PCs was the increasing concern about the farm economy. In early June, a Des Moines Register article cited low prices and potential trade wars as issues that could “devastate commodity prices.”² The Cedar Rapids Gazette used the same word when reporting that tariffs (along with bumper crops) could pose a “devastating impact” on the lives of farmers in the state.³ The attention of the press was not limited to Iowa newspapers. In describing the potential impact of a trade war on the state of Iowa, an August 2018 New York Times article stated, “If the trade dispute between the United States and much of the world isn’t resolved soon, economists say it will almost certainly lead to layoffs and unyielding financial loss across the state.”⁴

Another factor receiving attention in both state and national media was the worsening water quality in Iowa – a threat to waters beyond Iowa through passage down the Mississippi and Missouri Rivers. An April 2018 study conducted by IFC researchers indicated that the nutrient load originating in Iowa is

¹ Yarbrough, D.B., Shula, L.M., Hopson, R.K., Caruthers, F.A. (2010). *The Program Evaluation Standards: A guide for evaluators and evaluation users* (3rd. Ed). Thousand Oaks, CA:Corwin Press.

² <https://www.desmoinesregister.com/story/money/agriculture/2018/06/04/trade-war-tariffs-farm-iowa-economy-low-prices-dispute-interest-rates-debt-worries-crisis-1980-s/661905002/>

³ <https://www.thegazette.com/subject/news/government/bumper-crops-and-tariffs-pose-double-whammy-for-iowa-farmers-20180707>

⁴ <https://www.nytimes.com/2018/08/17/business/economy/iowa-trade-midterms.html>

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increasing.⁵ The Cedar Rapids Gazette reported that “Iowa’s nitrate discharge is disproportionate to the amount of water flowing into rivers that border the state”⁶ and Boston public radio station WBUR’s nationally-syndicated program *On Point* declared, “Iowa’s water pollution problem is getting worse and the impact is felt all the way to the Gulf of Mexico.”⁷ A small-town Iowa newspaper publisher, Art Cullen of the Storm Lake Times, won the 2017 Pulitzer Prize for his editorial writing on controversial topics including water quality.^{8,9}

Finally, the weather has continued to have an impact on Iowa, making sure that catastrophic flooding complete with flood-related Presidential Disaster Declarations, does not escape the public memory. Floods in early June impacted the Des Moines area (as well as other parts of the state).¹⁰ At the IWA WMA meetings, IFC engineers kept WMA meeting attendees up to date on the heavy rainfall events that continued across Iowa through the summer and early fall. The Iowa Watershed Approach Information System (<http://iwa.iowawis.org/>) (and its parent site, the Iowa Flood Information System (IFIS)) are not only used by IFC engineers, but also widely used by local news media and Iowa residents.¹¹

IWA Programmatic Components

IWA Partners

One component of the IWA is the presence of many partner groups with varied expertise intended to support the development and functioning of the WMAs and the implementation of the IWA. By design, IWA partners’ support for WMAs and project coordinators (PCs) varied in frequency and intensity during Year 2. Despite this variance, a majority of partners reported that their effort related to working with WMAs and PCs was as they expected.

PCs reported working with the partners at varied levels and receiving different types of support. Generally, PCs said they benefitted from strong communication with the partners but had some ongoing confusion over everyone’s roles. All of the PCs said they understood the roles of Iowa Department of Agriculture and Land Stewardship (IDALS), Iowa Department of Natural Resources (IDNR), Iowa Department of Homeland Security and Emergency Management (HSEMD), Iowa State University Extension and Outreach (ISU EO), and the Iowa Flood Center (IFC) at the University of Iowa. PCs reported receiving the following support from these partners during Year 2:

- *IDALS*: Provided training, information, and direct support
- *IDNR*: Conducted on-site visits and provided information, technical data (tillage practices, stream assessments, water quality data), and direct support

⁵ <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0195930>

⁶ <https://www.thegazette.com/subject/news/public-safety/study-iowas-share-of-nitrate-to-mississippi-missouri-rivers-disproportionate-to-water-flow-20180529>

⁷ <http://www.wbur.org/onpoint/2018/07/16/iowa-water-pollution%27>

⁸ <http://www.stormlake.com/articles/2017/04/12/our-pulitzer-prize-winning-editorials>

⁹ <https://www.pulitzer.org/winners/art-cullen>

¹⁰ <https://www.desmoinesregister.com/story/news/2018/07/17/polk-county-des-moines-clive-flood-flooding-weather-ankeny-fema-emergency-iowa-damage-federal-ia/791942002/>

¹¹ <https://www.kcrg.com/content/news/Iowa-Flood-Center-website-helps-forecast-flood-conditions-and-damage-475609853.html>

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- *HSEMD*: Provided information about opportunities for funding for future watershed projects, integrating watershed plans and hazard mitigation plans, and specific flood damages in watersheds and hosted the bi-annual IWA partner meetings
- *ISU EO*: Developed materials and communication plans, supported outreach and meeting facilitation, and hosted the Watershed Academy
- *IFC*: Helped with work plan development, provided information about the IWA program as a whole, spoke at WMA and landowner meetings, provided support for outreach and, and provided technical support (water sampling, hydro modeling, selecting sub watersheds, targeting practices)

A majority of PCs said they understood the roles of Iowa Economic Development Authority (IEDA) and University of Northern Iowa Tallgrass Prairie Center (UNI TPC). PCs received support from these partners in the following ways.

- *IEDA*: Provided technical information about the grant, answered questions, clarified language required for HUD compliance, and strategized for potential projects in the watersheds
- *UNI TPC*: Provided information about prairie strips and native plantings and how prairie fits into IWA cost share and developed an informational flyer about prairie

About half of the PCs reported understanding the role of the Iowa State University Iowa Water Center (ISU IWC). PCs received support from ISU IWC through participation in the Iowa Water Conference and WMAs of Iowa.

Watershed planners reported that working with the partners has been going well, and they have benefitted from working and communicating with partners to overcome barriers. While most planners agreed that the partners' roles in the planning process were clear, they also described that it had been a challenge to understand the roles of the IWA partners and how they are contributing to the watershed planning process. Planners said that negotiating the level of interaction and input from partners made work on the IWA quite different from their typical watershed planning process.

During WMA meetings, IWA partners presented content, contributed to discussions, and answered technical questions about water resources or WMA procedural requirements. WMA meeting attendees said they wanted to know more about how each of the partners contributed to the project and how partners have worked with other stakeholder groups (e.g., NRCS, farmers, cities). Some WMA meeting attendees were curious what resources the partners bring to the WMAs (including possible additional funding), whether the partners would stay engaged after IWA was complete, and they hoped the partners would provide high quality technical information to carry out the work of their WMAs.

Hydrologic and Hydraulic Team

During Year 2, the University of Iowa Hydrologic and Hydraulics Team (H&H) continued to work on hydrologic assessments for all eight watersheds, completed placement of hydrologic monitoring stations and water quality sensors in each watershed, and continued to present information about their work and about other hydrologic-related topics to the IWA WMAs. Phase I hydrologic assessment reports were delivered in late summer 2018 or are anticipated to be delivered in Fall 2018 and include the following information:

- Hydrology and water quality data for all of Iowa

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- Hydrologic and water quality data at the watershed level including: watershed hydrology; geology and soils; topography; land use and Best Management Practices (BMP) mapping; potential BMPs generated using the Agricultural Conservation Planning Framework (ACPF); observed stream conditions at all available sensors; the water cycle; and historic information on baseflow, runoff trends, and flooding.
- Watershed scenarios for potential flood conditions with the implementation of proposed conservation practices
- Model calibration and validation procedures using historic storm events and simulated flood conditions

The H&H team started their modeling process using the Penn State Integrated Hydrologic Model (PIHM) to create watershed models for the IWA. In order to better meet their needs, they developed the Generic Hydrologic Overland Sub-surface Toolkit (GHOST) and are now using that for the IWA watershed modeling. Like the PIHM, GHOST is an open-source, community based model. The use of GHOST has decreased simulation run times and greatly improved the modeling of infiltration. H&H used GHOST in the eastern Iowa watersheds and a tool from the US Army Corps of Engineers (HEC-HMS) in the western Iowa watersheds for the Phase I reports and will use GHOST for all IWA watershed modeling in the Phase II reports.

The H&H team actively participated in many of the WMA meetings as formal presenters and contributors to discussion. Some of the topics addressed during Year 2 H&H WMA meeting presentations included: 2017 rainfall data; drought information; FEMA flood-related Presidential Disaster Declarations in the US and Iowa; land use, soils, and topography; existing BMPs in the watersheds; recommendations for conservation practices generated by the ACPF tool; calibration and validation of models; and scenarios showing potential impact of cover crops and installed conservation practices on stream flow. Additionally, the H&H team provided guidance to the WMAs related to HUC 12 selection, while emphasizing the WMAs' need to prioritize landowner interest.

Flood Resilience Team

In Year 2, FRT conducted four team meetings to introduce new team members and provide updates on team activities. FRT also met twice with the BBHH team in Dubuque, IA because they also focus on the social and human components of flood mitigation. The FRT also leads and participates in meetings with parties both internal and external to IWA. The purpose of some of the meetings was to explore potential connections with the FRT, and then to build on these connections (e.g., Stacie Johnson from Green Stormwater Infrastructure, Iowa Valley Resource Conservation and Development, Benton County Disaster Recovery Coalition).

Two Iowa Homeland Security and Emergency Management (HSEMD) team members, active collaborators with the FRT team, described the role of the FRT as:

- To highlight the needs of the socially vulnerable in flood situations and potential strategies to help them and to “cover the gaps that are being missed by the watershed plan”
- To aid in integrating hazard mitigation planning into watershed plans and in finding ways to help communities understand more about their situations (e.g., opportunities to improve Community Rating System scores)

Over the course of Year 2, PCs indicated that they have increased understanding of the role of the FRT.

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In August-October 2017, WMA meeting attendees across project watersheds reported varied levels of understanding of the role of FRT. PCs reported benefitting from the FRT through clarification of FRT's role in IWA, better understanding of the concept of community resilience, and getting FRT support in creating a presentation. Going forward, PCs said they would like support in mapping flood impact on people in watersheds, promoting the IWA project, reaching out to people in communities, and mitigation planning. Complementarily, one watershed planner said they will need support for "connecting the resiliency plans with hazard mitigation plans so they are recognized by FEMA and emergency management."

Team members from HSEMD said Flood Resilience Action Plans (FRAPS) (being developed by the FRT in collaboration with HSEMD and the IFC) will be used locally to help communities be more prepared for disaster and decision making about protective measures because they will know where to expect flooding and who will be impacted. Early in the FRAP development process, as part of the IWA evaluation process, the CEA recommended that the CEA and FRT work together to establish a collaborative review process to obtain feedback from knowledgeable others to maximize the quality of the document and to ensure that the FRAP fulfills its stated purposes. In July 2018, the FRT said that given the input they had received from the first rounds of feedback, they were going to be making significant changes to the organization and purposes of the FRAP, and the schedule for completing the FRAPs was to be altered. The CEA has asked the FRT to provide details about the revised FRAP including a fully-articulated plan for the purposes for the different sections of the FRAP, the intended audiences, and the intended uses for the FRAP.

During May-August 2018, FRT presented at WMA meetings about various aspects of their program. Presentations differed depending on FRT cohort to which the WMA belonged. The two different presentations either provided an introduction to flood resilience and what it means in the IWA, or focused on resilience more specifically as it applies to flood mitigation and hazard planning work.

- Meeting attendees indicated that the discussion was at least somewhat helpful for them in understanding resilience.
- Meeting attendees were somewhat less sure about the relevance of the social resilience presentation for their WMA, but they were positive about the potential utility of applying for pre-disaster mitigation funding.

In all cases, respondents were asked which aspects of the flood resilience work are most important to their watersheds. Responses to this item were varied and included things such as links with emergency management agencies, the "social side" of resilience, potential to plan and mitigate based on models and simulation, and the need for more communication and awareness about flood risks and mitigation potential.

IWA Project Coordinators

An important aspect of the IWA is the presence in each of the eight IWA watersheds of a dedicated project coordinator (PC) who is responsible for coordinating the IWA work in the watershed. The watersheds hired the PCs themselves with input and support from IWA partners. As of November 2017, PCs have been hired for all IWA watersheds. The PCs come from educational backgrounds focused on the land and how it is used. They bring varied agency experience to their work (i.e., NRCS, US Fish and

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Wildlife Services, state and county conservation departments, AmeriCorps, and Pheasants Forever) and common interests related to working with people and having a positive impact on the land.

In early 2018, PCs indicated that the work with their WMAs was going well and they have a clear vision for their work in the watershed. They reported consistent priorities during the two Year 2 surveys: logistics of selling practices and the procedures involved; getting projects on the ground; planning; and outreach.

PCs reported consistent challenges with the tight program timeline and the slow progress on certain aspects of the project logistics. Additionally, for some of the PCs, there are some ongoing supervisory difficulties.

When asked about their confidence about their IWA work, most PCs were quite optimistic with four choosing 4 or 5 on a five-point scale where five signified, “We can do it!” Two PCs were more cautious, selecting three on the scale (“There’s a 50/50 chance”). One of the PCs who was less optimistic expressed concern about the farm economy making it difficult to raise the cost share and that limited areas of eligibility made it hard to sell practices. One of the most optimistic PCs cited the partners’ support as important as well as having a WMA with “great momentum.”

IWA Watershed Planners

An important aspect of the IWA is the explicit designation of grant funds for all eight IWA watersheds to secure watershed and flood resilience planning services to produce a FEMA-compliant, comprehensive watershed planning effort to address factors that contribute to flooding and water quality in each watershed. By August 2018, all but one watershed had hired their watershed planners. In late 2017 to early 2018, planners expressed confidence that they were on schedule to complete their watershed plans on time, but expressed some concerns about the workload related to timeline and funding. Most respondents said the biggest challenge has been navigating the roles of the different IWA partners and how they will be contributing to the plans. Planners said regular interaction with the partners themselves has helped them with this.

Planners said they anticipate challenges with coordinating deliverables with partners and making their deadlines in the next six months. They indicated that working with local stakeholders (their WMA, WMA board, PCs), gaining information from the hydrology plans; and connecting the hazard mitigation plans with their watershed plans will help them to address these challenges.

In the coming months, planners anticipated focusing on stakeholder engagement, working with WMAs to develop goal, and other early planning efforts (e.g., getting stakeholder collaboration, developing community specific plans).

Watershed Case Studies

The IWA program evaluation is designed to look at each watershed as a unique entity, but also to look across watersheds to discover commonalities. Each WMA receives consistent support through IWA funding and partners, but each watershed is distinct in terms of local terrain, culture, priorities, strengths, and challenges. At the end of Year 2 all of the watersheds have:

- Hired watershed planners (North Raccoon’s planner was selected in September 2018)
- Hired engineering firms

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- Identified HUC 12s for conservation practices

In terms of the IWA timetable, there is a range of where the WMAs are in their IWA process, but as of September 2018, none of the watersheds have conservation practice construction work out to bid. The first bid packages are expected to go out in late Fall 2018.

Bee Branch Healthy Homes Resiliency Program

During Year 2, there were two elements of the IWA evaluation related to the BBHH: 1) interviews with the BBHH staff and, 2) interviews with BBHH clients. BBHH clients are Dubuque residents who have had construction done on their homes to mitigate the impact of repeated flash flood damage, and who have the opportunity to work with home advocates about other concerns they may be experiencing.

BBHH team members described that they are getting both busier and more comfortable with their work in serving the needs of eligible residents. They described ways that participants are already benefitting from the BBHH program: there is less water in properties, families can use their basements again, families are experiencing less stress and worry, families are receiving referrals for needed resources, and there is a “human touch.” A major theme throughout the interviews was there is no “one size fits all” approach, so it’s important to be responsive to the needs of each individual.

A majority of BBHH clients who were interviewed described that participating in the program will have a positive impact on their lives financially, personally, and through increased pride in their neighborhood. One participant said, “I think it’s a wonderful project. I think that the work they did, outside of just helping the homes and the sustainability of the homes in this area that they did for Bee Branch, the landscaping and the securing of all that...is beautiful.” The group described the “best parts” of the program to be the work done on their home to prevent further water damage, working with the City of Dubuque staff and contractors, and that low-to-moderate income residents have access to this type of program.