The Impacts of a Civic Engagement Cohort Program for Water Quality Professionals

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Abstract: In this article, researchers report the impact study results of University of Minnesota Extension's civic engagement for water quality cohort program. The cohort curriculum highlights Extension's research-informed, five-stage civic engagement model emphasizing process design and process management. Using a non-random comparison group design, a survey was conducted with participants of three civic engagement cohorts for water quality professionals, as well as a comparison group of water quality professionals not part of a cohort. Survey results were aggregated into the five stages of Extension's civic engagement process: prepare, inquire, analyze, synthesize, and act together. Findings indicated cohort participants experienced significantly better results than members of the comparison group in four of the five stages. A strength of Extension's civic engagement model and curriculum is its emphasis on the collective nature and processual aspects of civic engagement work. Cohort participants received training on civic engagement skills, which are not often emphasized in education for water quality professionals. While both groups reported a high frequency of increased civic engagement skills, cohort participants did not report more frequent collaboration or public engagement behaviors than comparison group members. A challenge for those training water quality professionals is instilling the value of civic engagement skills in addition to the more traditional technical skill sets associated with water quality work. Additionally, ongoing training and organizational support is needed for practitioners to effectively implement new skills and leverage new networks.

Keywords: *Extension, training, professional development, watershed leadership*

With more than 10,000 lakes, Minnesota offers an abundance of water resources that bring opportunities for recreation, agriculture, and tourism. The quality of Minnesota's water, however, is not always good. The list of waterbodies in the state that do not meet Minnesota water quality standards continues to rise as more waters are assessed (Minnesota Pollution Control Agency 2017). Identifying the causes of water pollution is complex, as many sources and issues exist. The topic of water quality and watershed planning can also be considered a "wicked problem" that is "ill-defined" and for which there is no "optimal solution"—only ones that may be "re-solved" over and over again (Rittel and Webber 1973, 155).

Water quality professionals work to address the above issues by considering a range of solutions that include technical, social, and policy approaches. Many water quality professionals come from a technical background, such as engineering, geology, biology, and mathematics. While technical solutions are important, they cannot improve water quality unless implemented. Daniels and Walker (2001) noted the need for public involvement in addition to technical solutions. Water quality professionals can help facilitate public involvement, but to do so they must build their social and leadership skills, as well as their ability to manage complex issues (Snowden and Boone 2007; Morton 2011; Wolfson et al. 2015).

University of Minnesota Extension has worked with residents of Minnesota to address water quality concerns, such as wastewater and stormwater management, agricultural runoff, and

aquatic invasive species. This work has primarily focused on technical solutions. In 2012, leadership and civic engagement educators for Extension's Center for Community Vitality collaborated with the Minnesota Pollution Control Agency (MPCA) to help local water quality professionals and volunteers better work with the public on more authentic civic engagement efforts. This effort allowed Extension to test a civic engagement model recently developed by its leadership and civic engagement team (Radke 2013; Radke and Chazdon 2015). Research shows an informed decision is not enough. Addressing these issues requires authentic civic engagement (deliberative dialogue). As a result, water quality civic engagement cohorts formed in several areas of the state.

In this article, researchers report the impact study results of Extension's water quality civic engagement cohort programs. The research team conducted an online survey with the participants of three cohorts, as well as a comparison group of water quality professionals who were not part of a cohort. Researchers studied online survey results to compare civic engagement competencies of cohort participants with the comparison group. Survey results revealed differences in civic engagement behaviors, collaboration opportunities among water quality professionals and the public, the effectiveness of the cohort curriculum, and future training needs. In addition to an online survey, the research team conducted interviews with a small group of program participants using the Success Case Method (Brinkerhoff 2002) to better understand how cohort participation influenced civic engagement activities and networking.

Literature Review

Public Participation in Watershed Management

Public involvement in water quality planning and decision making is desirable since federal, state, and local agencies are often required to invite public participation when addressing nonpoint source water pollution issues. Beyond this requirement, it is important that any water quality solutions are embraced by the stakeholders as those are more likely to be implemented (Prokopy and Floress 2011). The likelihood of robust public participation

increases when a diverse group of participants share their experience, knowledge, and ideas (Floress et al. 2009; Selfa and Becerra 2011). Many proponents of public involvement in water quality planning believe it leads to better planning and decision making outcomes because local knowledge is critical to understanding local systems.

Successful watershed partnerships and watershed management are characterized by trust and positive relationships between the parties involved, such as stakeholders and water quality professionals (Foster-Fishman 2001; Leach and Pelkey 2001; Gooch 2004; Leach and Sabatier 2005; Mountjoy et al. 2013). Understanding the concerns of all parties involved is also critical (Downing et al. 2011). The use of participatory approaches and participant led decision making, to the greatest extent possible, have also been found to yield positive results (Smolko et al. 2002; Prokopy and Floress 2011). The International Association of Public Participation (IAP2 2014) Spectrum offers a five-step process for increasing public participation that includes informing, consulting, involving, collaborating, and empowering. While multiple forms of participation may occur simultaneously, the more in-depth approach may not be feasible in situations where actions are legally mandated or time is limited. The goal of any public participation process is to involve others in decision making (also known as co-management or collaboration). This involvement includes equal contribution from both the government and stakeholders (Prokopy and Floress 2011).

Water quality professionals can help facilitate effective public engagement as part of watershed management. According to Brown (2011, 249), water quality professionals may have a range of interest and willingness to involve the public. Some view public engagement as a "time-consuming agency mandate." Others view it as a "moral imperative for public programs and management of public resources in a democratic society." Most people, however, fall somewhere in between (Brown 2011).

Minnesota is currently facing a shift in water quality monitoring, assessment, and management planning. The MPCA is conducting 10-year assessments of major watersheds (Hydrologic Unit Code-8 scale), which involve intensive monitoring

of water chemistry and biology at multiple locations in each watershed. Led by the Board of Water and Soil Resources (BWSR), the state is shifting from local water management plans based on county, watershed district, or watershed management organization boundaries, to plans based on major watershed boundaries. Both efforts require that water quality professionals involve the public in a variety of capacities. Expected outcomes include the creation and implementation of watershed plans.

While developing these plans is important, the *process* of establishing them is also critical for implementation to succeed (McCool and Guthrie 2001). For example, several rounds of watershed planning occurred in Pierce County, Washington during the 1990s that used approaches for maximizing participation, learning, and creativity. The process also helped the development of partnerships and resulted in high levels of implementation and process ownership by those involved (Smolko et al. 2002). To achieve this level of public participation related to water quality, government agencies and organizations with convening roles must have staff with the necessary competencies to facilitate this type of participatory process.

The Skill Set of Water Quality Professionals

Watershed work requires successful partnerships with leadership and management (Leach and Pelkey 2001). According to Brown (2011, 250), "Leaders create structured opportunities for talking about water concerns and guide productive discussion among citizens and groups so that areas of agreement and disagreement are transparent but mutually respected."

Watershed leaders and managers engage others through a variety of civic engagement processes to reach desired water quality outcomes. A literature review conducted in 2015 (Illes 2016) was referenced in a subsequent report entitled *Social Indicators for Watershed Leadership* (Bonnell and Baird 2015). This review listed 18 topics (see Appendix) for potential inclusion in watershed leadership and development programming. Bonnell and Baird's (2015) categories and subcategories for watershed leadership, summarized in Table 1, emerged from a qualitative study of successful watershed coordinators in Ohio.

Communication is important when working with stakeholders, elected officials, and partnering organizations. Interpersonal skills are necessary to cultivate professional networks, multidisciplinary teams, and successful partnerships. Brown (2011) and Morton (2011) both note the importance of trust when building relationships to carry out watershed work. Relationships and informal social networks are critical for success (Nelson et al. 2017).

Smolko et al. (2002, 993) commented that: "Participatory methods are seen as "touchy feely," implying that they do nothing more than make the group members feel good about themselves and each other. This is linked to cultural perceptions

Table 1. Framework from the literature review: Attributes of Effective Watershed Leaders, from Bonnell and Baird (2015).
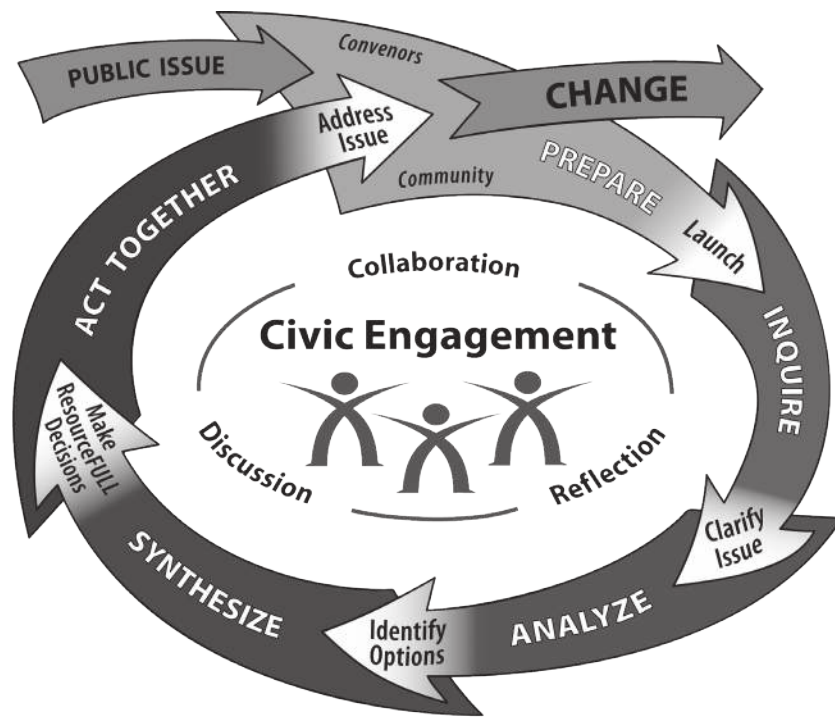
Attributes of Effective Watershed Leaders (categories)	Attributes of Effective Watershed Leaders (subcategories)
Technical	Tools and techniques
	Specialized knowledge base
	Systems thinking/problem-solving/analytical skills
Administrative	Project management
	Grant-writing and management
Social	Communication and education
	Interpersonal and group dynamics
	Community dynamics
	Political dynamics

about leadership. Our culture admires leaders who make decisions quickly and unilaterally which is seemingly at odds with our democratic ideals." In Minnesota, as in most areas, watershed leaders are often skilled in the technical aspects of their work but lack specific training in interpersonal and group communication, team building, and forming partnerships. Bonnell and Baird (2015) suggest more training is needed in these areas. Developing the leadership and civic engagement skills of water quality professionals can happen in a variety of ways, as noted in a summary by Wolfson et al. (2015). This summary provides a comparison of training methodologies and emphasizes the importance of networking, participant interaction (either online or in-person), and the inclusion of local and state-specific perspectives. Wolfson et al. (2015) surveyed study participants who rated organizational and interpersonal skills as critical to their work. The most beneficial competencies included effective communication, organizational and project management skills, facilitative leadership, vision, and collaboration.

Civic Engagement Model and Cohorts

University of Minnesota Extension developed a research-informed model for civic engagement (Radke 2013; Radke and Chazdon 2015). Research shows an informed decision is not enough. Addressing these issues requires authentic civic engagement (deliberative dialogue) to describe an authentic civic engagement process and to create a curriculum for Extension programming. Civic engagement is described as, "Making resourceFULL decisions and taking collective action on public issues through processes of public discussion, reflection, and collaboration" (Radke et al. 2012). The term "resourceFULL" was coined by University of Minnesota Extension to represent decisions that are not lacking in collaboration, trust, and relationships (Radke and Chazdon 2015). The model is framed around five stages: prepare, inquire, analyze, synthesize, and act together (Figure 1).

To strengthen teaching and evaluation, Extension's leadership and civic engagement team, with support from evaluation staff, developed

Figure 1. University of Minnesota Extension civic engagement model.

a series of 13 civic engagement competencies associated with the above five stages. These civic engagement competencies were developed based on a literature review of relevant research as well as the practical experiences gained by Extension Educators through teaching and working in communities. Table 2 shows the relationship between the 13 competencies and five stages and provides a general definition of each competency. Competencies needed for the "inquire" and "analyze" stages—framing issues, identifying options, and thinking critically—are the same. Three areas of competency—collaboration, reflection, and discussion—are considered core to all stages of the civic engagement process.

From 2012 to 2017, the MPCA and University of Minnesota Extension worked with local water quality professionals, organizations, and stakeholders who work or volunteer on behalf of water protection and restoration. Through a cohort format, the MPCA and Extension helped these individuals enhance their civic engagement skills. This approach to teaching civic engagement differs from other watershed leadership programs in that

Table 2. Extension's civic engagement model — stages and competencies.

Stage of Civic Engagement	Civic Engagement Competencies
Prepare	• Understanding civic engagement • Assessing community readiness
Inquire and Analyze	• Framing issues • Identifying options • Thinking critically
Synthesize	• Making group decisions • Planning
Act Together	• Communicating • Managing • Evaluating
Core Competencies Needed in All Stages	• Collaborating • Reflecting • Discussing

civic engagement work is the central focus of the training. The competencies developed for the newly created civic engagement model provided the curriculum basis for the cohorts.

While not specifically designed as a leadership program, these cohorts covered many of the topics necessary for successful watershed leadership: understanding watershed history, stakeholder analysis, engagement and building trust, decision making, power and interest, balancing technical expertise with local knowledge, facilitating communication and co-learning between these groups, critical thinking, and conflict management skills (Illes 2016). Each cohort aimed to accomplish the following:

1. Build networks for working on water quality within participants' respective region(s),
2. Enhance the capacity of water quality professionals to engage with stakeholders and the public to address water protection and restoration, and
3. Facilitate co-learning among participants on the issue of water quality.

This study focused on three cohorts based on geographical locations: Southeast (SE), Southwest (SW), and Northeast (NE). The cohorts were convened between 2012 to 2014 and were chosen for this study because they occurred a few years ago, giving participants time to apply their skills and knowledge. At the end of each cohort, participants rated the growth of their skills in each of the 13 competency areas, using a retrospective pre-post survey design. They reported strong gains in all competency areas, with the biggest increases related to the "prepare" and "synthesize" stages of the civic engagement process. Figure 2 displays the results from each of the three cohort's retrospective pre- and post- surveys, which were conducted when each cohort ended.

Methods

Researchers employed a mixed-methods strategy to measure the impacts of the water quality civic engagement cohort program. First, a non-random comparison group survey was conducted with participants of three cohorts, as well as a comparison group of water quality professionals not part of a cohort. Second,
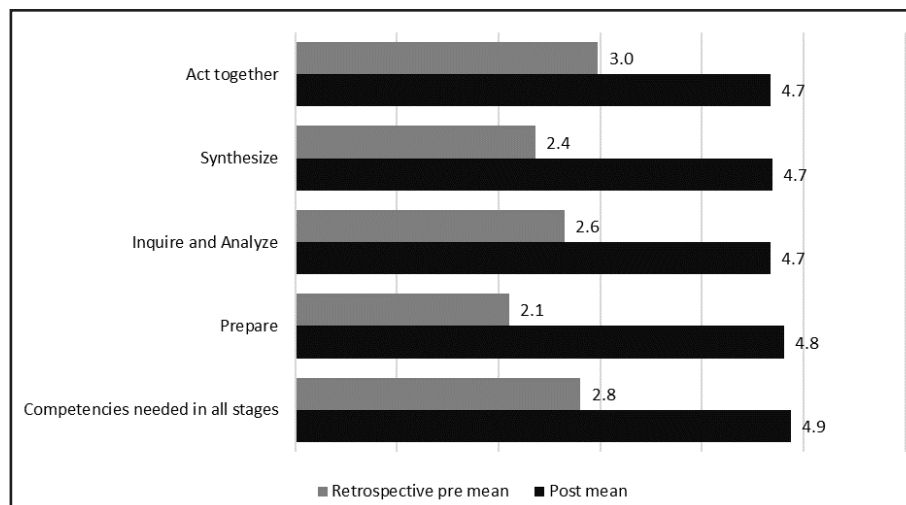
Figure 2. Changes in competencies as measured by end of cohort surveys (n=58). Scale: 1=weak to 6=strong.

following Brinkerhoff's Success Case Method (Brinkerhoff 2002), interviews were conducted with a small group of cohort program participants to better understand how the program influenced their civic engagement practices.

Online Survey

An online survey compared the similarities and differences in civic engagement competencies and behaviors of both program participants and the comparison group. The survey was sent to 63 former cohort program participants, with 39 responding (a 62% response rate). Comparison group members were identified through personal networks of the primary author who is a former water quality professional. After an explanatory email about the study, the survey was sent to 64 comparison group members, with 34 responding (a 53% response rate).

The online survey included three statements designed to measure each of the 13 civic engagement competencies. The survey questions were similar to the competency statements that were developed along with the civic engagement curriculum, and have been used in end of program evaluation surveys. A complete list of these statements is shown in Table 3.

The survey also included a section on civic engagement networking behaviors, specifically, collaboration with other water quality professionals and engagement with members of the public. Participants were asked to think about the past 12 months and indicate the level of frequency they worked or collaborated with others to address soil and water quality in a watershed(s). Table 4 displays the questions asked about each type of networking activity.

Success Case Interviews

Using Brinkerhoff's Success Case Method (Brinkerhoff 2002), a member of the research team conducted interviews with a small group of program participants to better understand how the program influenced their civic engagement practices. The Success Case Method is an evaluation approach that combines survey research with qualitative case study interviews to reveal the results of a program or intervention. The approach begins with a survey that includes questions to identify the strongest examples of success (and sometimes failure). The research team used several open-ended questions from the online survey to identify potential success cases, specifically among the pool of program participants who agreed to be interviewed. Members of the research team also looked for program participants who provided specific examples of how their participation in the program changed their professional practice and helped them successfully collaborate with and engage the public in water quality efforts. Four program participants were interviewed over the phone, and each interview was recorded and transcribed.

Table 3. Survey skills/questions for cohort participants and comparison group.

Skills	Survey Item (response categories: 1 = not at all proficient, 2 = a little proficient, 3 = somewhat proficient, and 4 = highly proficient)
Understanding Civic Engagement	• Explaining the benefits of civic engagement in addressing a public issue. • Articulating an approach for "doing" civic engagement. • Explaining the importance of process design for civic engagement.
Assessing Community Readiness	• Examining a community's level of awareness and concern regarding a public issue. • Conducting stakeholder analysis to identify which interest groups should be included to address a particular public issue. • Determining whether a community is ready to engage in a civic engagement process to address a public issue.
Framing Issues	• Demonstrating questioning techniques that draw out similarities and differences of how participants perceive the issue. • Gathering resources and data to help identify the complexity of the presenting issue. • Framing public issues in ways that include a broad range of stakeholders.
Identifying Options	• Choosing analysis methods that enable groups to generate options to address a public issue. • Applying dialogue and reflection processes to reach a shared understanding of options. • Anticipating stakeholder responses to options.
Critical Thinking	• Identifying the difference between a presenting issue and an underlying issue. • Questioning assumptions when thinking about a public issue. • Examining a public issue from multiple perspectives.
Making Group Decisions	• Choosing group decision making techniques that fit the needs of the situation. • Leading a group to a decision using consensus-building techniques. • Designing processes to move a group from information gathering to decision making.
Planning	• Engaging those directly affected in the planning process. • Identifying the resources needed to successfully implement an action plan. • Choosing strategies to organize and manage the implementation of the action plan.
Communication	• Adapting communication methods to reach participants from diverse perspectives. • Using clear and concise communication skills. • Using active listening skills to promote collective action.
Management	• Facilitating effective working relationships to support collective action. • Modeling effective ways to deal with conflict in a group. • Facilitating processes to effectively manage the action plan.
Evaluation	• Defining measurable benchmarks or indicators to show progress. • Using evaluation activities to determine whether the issue has been addressed or more work is needed. • Using participatory evaluation methods that reinforce civic engagement.
Collaboration	• Designing events that foster collaboration toward solutions on water quality or other public issues. • Seeking inclusivity and diverse perspectives for collective action. • Creating trust and enhancing relationships.
Reflection	• Identifying the times when I need to reflect on a process or problem before acting. • Designing experiences that encourage consideration of diverse points of view with regard to water quality or other public issues. • Communicating the importance of reflection for continuous learning.
Discussion	• Designing events that foster meaningful discussion among diverse interests working on water quality or other public issues. • Using dialogue processes to promote understanding of multiple perspectives. • Facilitating deliberation processes to reach decisions on a public issue.

Table 4. Survey questions regarding networking activities.

Network Behavior Type	Survey Item (response categories: 0 = not at all, 1 = about once/year, 2 = about quarterly, 3 = about monthly, and 4 = weekly or more often)
Collaborating	I worked or collaborated with other agencies or organizations working on soil and water quality in my watershed.
Collaborating	I worked or collaborated with other agencies or organizations in other watersheds.
Collaborating	I actively sought out information beyond those I typically work with on soil and water quality.
Collaborating	I tapped into the skill set of others when I was preparing to engage with the public.
Engaging	I engaged with members of the public to determine the community's readiness to address issues of soil and water quality.
Engaging	I engaged with members of the public to clarify our mutual understanding of soil and water quality issues.
Engaging	I engaged with members of the public to identify options for addressing soil and water quality.
Engaging	I engaged with members of the public for soil and water quality decision making.
Engaging	I engaged with members of the public to implement a soil and water quality plan.

Results

Competency Survey Results

Both survey groups—cohort program participants and comparison group members—were asked a series of questions about their proficiency in 13 competencies: collaboration, reflection, discussion, understanding civic engagement, assessing community readiness, framing issues, identifying options, critical thinking, making group decisions, planning, communication, management, and evaluation. Three survey questions pertained to each competency. Mean scores for each competency were calculated, as well as each stage of the civic engagement process. T-tests were then run to compare differences between the means of both study groups.

When aggregated into the five stages of the civic engagement process, data revealed cohort program participants experienced significantly better results than comparison group members in four of the five stages (with a 95% confidence level or higher). In each of the four areas, program participants reported average scores in the "somewhat proficient" range, while comparison group members tended to score themselves as "a little proficient" or "somewhat proficient." As shown in Figure 3, the largest difference occurred in the "act together" stage. This finding was interesting, given participants reported the weakest improvement in this competency at the end of the cohort programs. Having additional time to practice their new skills may explain the difference in findings. A significant difference did not exist between program participants and the comparison group for the core civic engagement competencies of collaboration, reflection, and discussion.

Statistically significant differences between program participants and the comparison group did occur, however, for 6 of the 13 civic engagement competencies. The competencies with significant differences were managing, evaluating, understanding civic engagement, making group decisions, identifying options, and framing issues. These results are shown in Figure 4.

Differences in means for the remaining seven competencies were not statistically significant, but
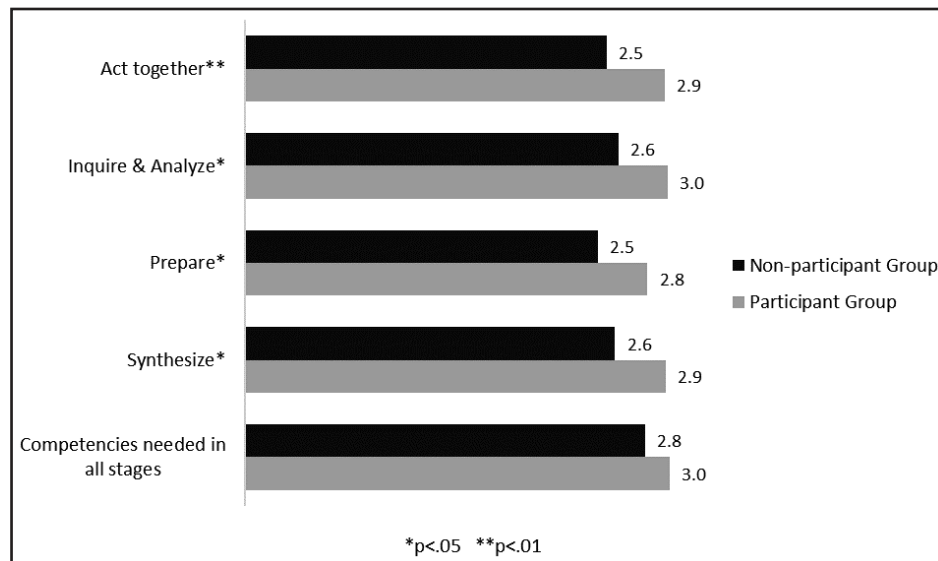
Figure 3. Differences in civic engagement skills, aggregated into stages. Scale: 1=Not proficient, 2=A little proficient, 3=Somewhat proficient, 4=Highly proficient.

all in the right direction (participants had higher means than comparison group members). We speculate that six of these seven competencies—collaborating, planning, communicating, thinking critically, discussing, and reflecting—are general skills many professionals may believe they possess, even without civic engagement training.

Both groups reported relatively weak skills for assessing community readiness, a competency that is specific to the training. Participants may not have recognized the connection between community readiness and stakeholder analysis, which is a better-known aspect of readiness assessment. Still, this may be an area in which training could be strengthened in the future.

The survey also asked participants an open-ended question about challenges or obstacles they faced while engaging stakeholders on water quality or other public issues. Themes that emerged from both groups included lack of time (for staff and public), attendance and participation at engagement offerings (such as community gatherings to talk about water quality concerns), the complexity of water pollution science and solutions, lack of organizational support, and peoples' inability to grasp the shift from their past experiences of "participation" to a more involved approach. While Extension can address some of these topics

through its cohort curriculum, others are more appropriately taught by other organizations.

Network Activities

An analysis of networking behaviors, both collaborative connections with peers and engagement connections with the public, showed differences in activity frequency. While we had anticipated the cohort participants would report higher frequencies of networking and engagement, the results did not show this pattern. In fact, the comparison group reported slightly higher levels of networking behavior, but the differences were not statistically significant. These results are shown in Figure 5.

On average, both participants and comparison group members reported a monthly frequency of peer collaboration. They both also reported, on average, a quarterly frequency of public engagement. In response to the open-ended survey questions, both groups shared challenges or obstacles they faced while collaborating with other water quality professionals. This included lack of time, differing priorities among staff and organizations, group dynamics among people within and across organizations, state agencies with different priorities and messages about civic engagement, lack of funding, and the desire to
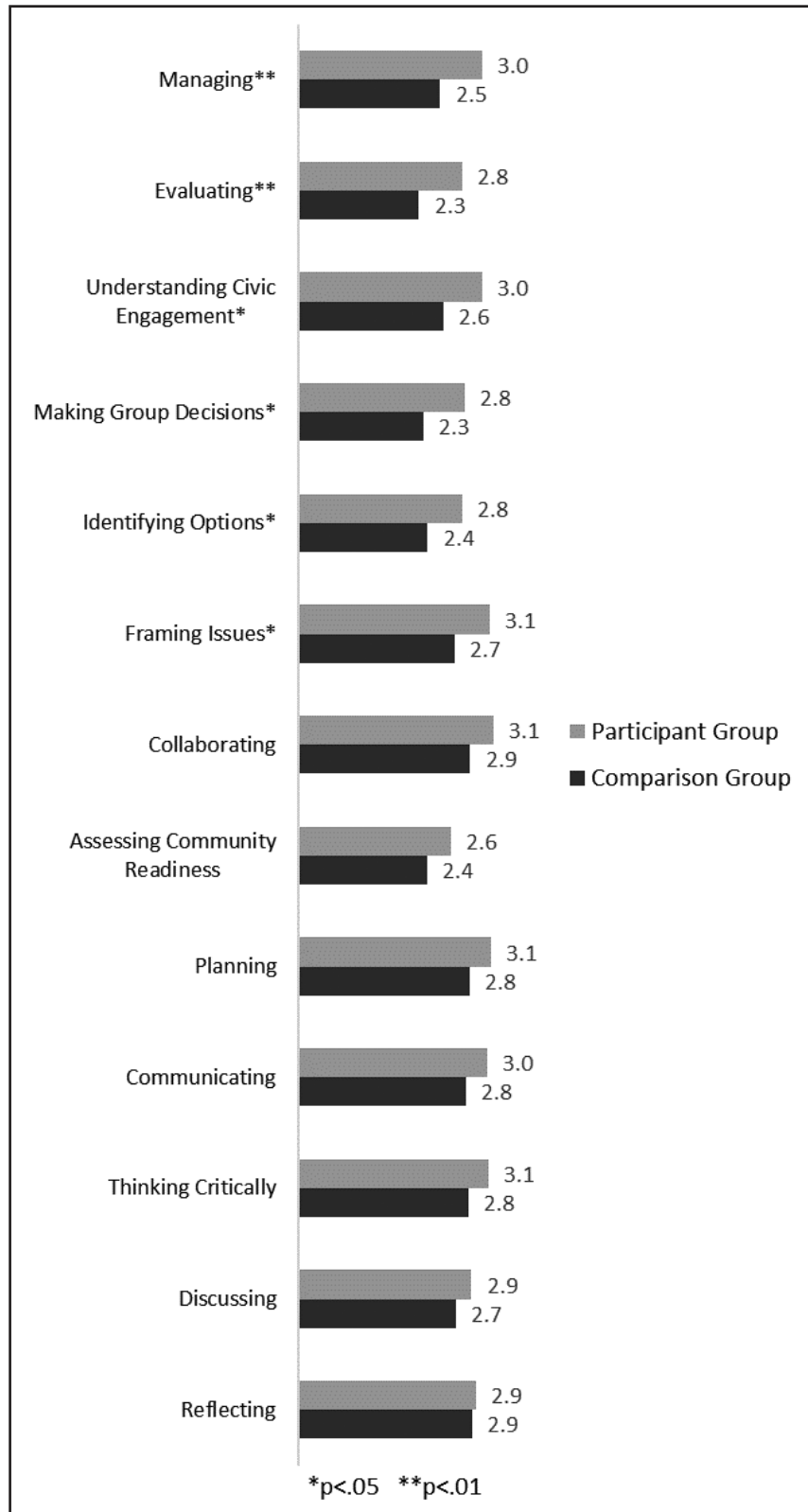
Figure 4. Differences in the 13 civic engagement skill areas. Scale: 1=Not proficient, 2=A little proficient, 3=Somewhat proficient, 4=Highly proficient.
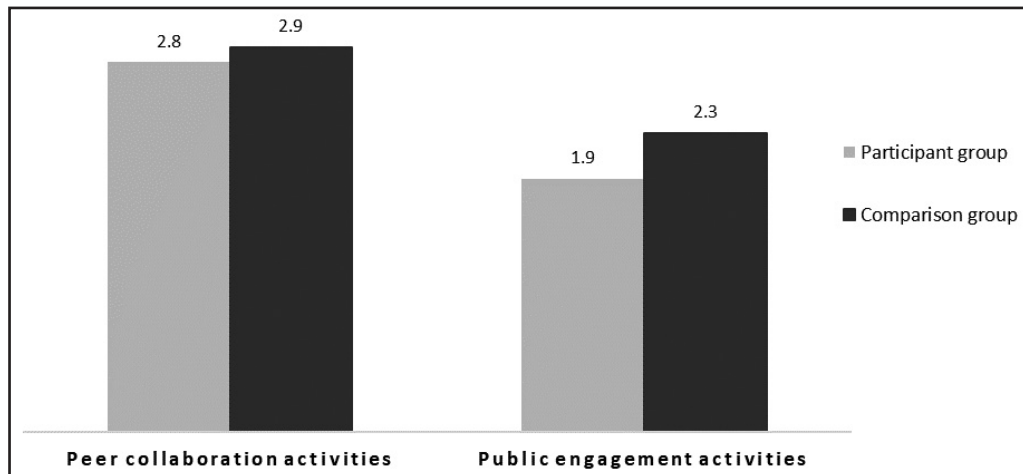
Figure 5. Differences in network activities. Scale: 0=never, 1=about once/year, 2=about quarterly, 3=about monthly, 4=weekly or more often.

accomplish things quickly without taking the time to build trust and relationships. Extension can likely address some of these issues during future cohorts, but others should be attended to outside the cohorts.

While the survey question asked about the frequency of networking behaviors, it did not address the depth or quality of these behaviors. This was a possible weakness in the survey design. In addition, members of the comparison group may have participated in networking opportunities created by cohort members. For example, cohorts in southeast and southwest Minnesota invited outside colleagues to join them for occasional continuing education and networking events. Since watershed planning takes place in various areas across the state, both cohort participants and comparison group members may have collaborated with one another to actively address watershed issues. It is also possible program participants have a better understanding of collaboration and engagement after completing the cohort program, and that additional knowledge was reflected in their survey responses.

Success Case Interview Data and Themes

Four participants from the cohort programs who reported success cases were selected for semi-structured interviews. Brinkerhoff (2002) recommends that a small number of success cases is sufficient to "poignantly illustrate the nature and scope of the success the program is helping

to produce" (Brinkerhoff 2002, 16). The interviews were recorded and transcribed, then coded for themes following a grounded theory approach (Glaser and Strauss 1967). They provided deeper insight into specific successes resulting from the cohort program. These successes included effective use of civic engagement strategies, growing citizen leadership, and better peer collaboration and networking. Additionally, participants reported support for, as well as barriers to, carrying out civic engagement efforts.

Using Civic Engagement Strategies Effectively

The interviewees often cited the success of using civic engagement strategies. Participants described effective meetings in which they used specific civic engagement techniques and tools, such as World Cafe (Brown and Isaacs 2005), a gallery walk, group ranking processes, stakeholder analysis, and small group discussions. For one professional, small group discussions were key to successful civic engagement.

"We've tried a lot of variety, but we often will go back to the small group discussion. Our fallback is to try to mix it up in small groups and get those diverse people that may not work together normally, sitting together and talking. I would say that has been one of the key things that we keep using over and over because it really helps."

Intentional meeting design, including the preparation of approaches, timing, and strategies for encouraging participation, was another

reported example of effective civic engagement strategies. Process design is a core element of the cohort program. Many participants discussed their success using multiple approaches or combining approaches in meetings. A common theme among all participants was the ability to read a room and determine the efficacy of their strategy. Participants reported experimenting with techniques to discover what worked best for different audiences.

Growing Public Leadership

Another commonly reported success among participants was seeing members of the public taking an active leadership role on local water quality issues. For example, one participant mentioned the success of a cover crop program designed entirely by stakeholders. By engaging diverse stakeholders and inviting them to participate in decision making, a stakeholder-designed, publicly funded five-year program of cover crop research was developed. According to this professional, the cohort program was instrumental in achieving this result.

"I don't think there's any way I would have ever tried it [civic engagement] had I not done the cohort. I think I get stuck in the same old rut of we don't really engage those citizens, we just tell them things. We do the education things, but we don't really bring them in. If I wouldn't have done that, this never would have happened."

Another participant described an effort in which she had applied the skills gained in the civic engagement cohort to train volunteers through a Watershed Restoration and Protection Strategy (WRAPS) grant. These volunteers went on to convene other meetings and ultimately form their own nonprofit.

"The citizens led those meetings. It wasn't agency staff or Extension staff—it was them. Out of that core group of people, [the] Friends of the Root River formed. I'd say half a dozen of those people were part of the civic engagement training."

Collaboration and Networks

The civic engagement cohort program sought to connect professionals and volunteers across agencies by creating a co-learning community. Through the program, participants developed deeper relationships and networks with other regional water quality professionals.

"That was the really nice part of that whole experience—that we got to know [a] cohort of people in a much richer way than just attending meetings and sitting there all night."

Developing these relationships created a network that participants could access for advice or collaboration. This sense of support was often created through shared knowledge and an understanding of civic engagement concepts and techniques. It also resulted in stronger civic engagement planning across agencies.

While the cohort provided a rich opportunity for networking and learning together, participants did face challenges with continued peer collaboration after the program ended. Some cohorts continued to meet semi-regularly, but their meetings soon slowed as other commitments and the time needed to plan the meetings arose. Discontinuing the meetings reduced the strength of the network and bridging opportunities that occurred during the program. Additionally, changing jobs and/or moving from the area where a cohort took place negatively affected networking.

Support for, and Barriers to, Success

Participants identified several critical areas of support, as well as barriers, to their success, which included agency prioritization, organizational support, time, funding, and resources. Prioritizing the need for civic engagement skills when addressing water quality issues has become increasingly important. Participants who reported successes indicated that their agencies valued and desired civic engagement.

Even among the agencies that prioritized civic engagement, however, a lack of staff exposure to civic engagement skills served as a barrier to success. Some professionals observed that many staff members with science backgrounds were both unfamiliar and uncomfortable with civic engagement processes. This resulted in a very limited number of staff trained in, and able to implement, civic engagement practices. As a result, time constraints to focus on civic engagement work and the lack of a strong support system prevented learning. Time was further constrained by the number of duties each professional was responsible for, in addition to developing their civic engagement skills.

Funding also emerged as a way to either support or limit successful civic engagement. While some agencies include civic engagement activities as budget line items, others require professionals to secure external grants. A lack of funding was cited as a critical barrier to success and its absence makes meaningful civic engagement work difficult. This corroborates the findings of Leach and Pelkey (2001) that funding is often cited as a factor in watershed success.

Discussion and Recommendations

A strength of Extension's civic engagement curriculum is its emphasis on the collective nature and processual aspects of civic engagement work. Our comparison group survey found significant differences between cohort program participants and comparison group members in self-reported skills representing four of the five stages of the civic engagement process – prepare, inquire and analyze, synthesize, and act together. These stages of the civic engagement process are not typically emphasized in technical training for water quality professionals. Interestingly, significant differences were not found in the core civic engagement competencies (collaboration, discussion, reflection) needed throughout all stages of the process. We speculate that these competencies are more general, so those who have not received the civic engagement training may feel confident in these skills and may be unaware of the complexity of these skills as discussed in the training.

Success case method findings provided a deeper understanding of how cohort participants used their program experience to succeed in collaboration and public engagement. These stories illustrated ways that participants have used civic engagement strategies effectively, grown public leadership, and collaborated with other water quality professionals. Examples of success included using skills gained in the program to work with farmers to implement a research project and to engage residents who then formed a nonprofit to protect and improve a watershed. These success stories highlight the value of the cohort programs and the difference they made in participants' work. They can also be used as inspiration and examples by Extension and other organizations and agencies working with

water quality professionals when planning future civic engagement trainings and cohorts.

Ideas for Program Change

While cohort participants found networking and learning opportunities valuable and intended to continue to meet after their cohorts ended, most formal gatherings happened less than hoped. Time constraints and other job duties influenced the frequency and planning of meetings. To help address the issue, Extension may want to consider offering both formal and informal continuing education, as well as networking opportunities, through alumni events.

Changes to the curriculum and cohort process may also need to be considered. For example, future cohorts might focus more on the concepts and practice of invitation and initial engagement strategies, trust and relationship building, and building and maintaining networks. This change may help participants better manage networks on their own. Also, providing more comprehensive resources on assessing community readiness may be valuable, such as incorporating aspects of the Multilevel Community Capacity Model (Davenport and Seekamp 2013).

Intentional support from participants' employers may also increase the level of civic engagement and network building they can accomplish, as well as avoid burnout of staff (Flora 2004). When staff are tasked with multiple job duties civic engagement activities can become overwhelming and burnout may occur. Additionally, consistent financial support is critical for ongoing civic engagement work. Interviewed participants noted that the amount of funding—or a lack of it—determined how much time and effort they allocated to civic engagement work. Both the MPCA and the BWSR provide support for continuing civic engagement training for water quality professionals. Their assistance is provided through funding and civic engagement training as a part of water quality grants.

Even the most robust civic engagement training and processes may not yield the level of public participation and collaboration desired if the public does not see the need for action. Prokopy et al. (2014, 1179) use the term "catalyst event" to describe an event or series of events that might help

to motivate such action and create change. These events could be intentional, such as government actions or funding, or unintentional, such as natural disasters or accidents (Prokopy et al. 2014).

While existing literature on watershed management focuses on a skill set needed for watershed leaders, it does not consider water quality within the broader context of civic engagement. Leadership skills are important to develop, but engaging in robust civic engagement is also a critical part of protecting and improving watersheds. Both public and government agencies often fail to recognize this and make decisions without considering—or implementing—a civic engagement process. There is evidence in the literature that effective civic engagement can lead to more efficient and effective implementation of conservation and protection practices. In addition, it is the right thing to do in a democracy.

Acknowledgements

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Appendix A

List of 18 topics for potential inclusion in watershed leadership development programming (Illes 2016)

1. Engaging a diversity of stakeholders based on educational level, socio-economic status, and other demographics.
2. Seeking stakeholder diversity in group composition: government/agency, environmental activists, leisure, tourism/economic, industry/farming, cultural, and others.
3. Recognizing and valuing diverse skills sets that participants bring to the group.
4. Ensuring that stakeholders who perceive they are affected are represented in the collaboration; recognizing stakeholders have different motivations for getting involved.
5. Balancing scientific experts' knowledge with normative knowledge of stakeholders in the geographic region.
6. Organizing a democratic process for stakeholder engagement, decision making, and assessing outcomes.
7. Recognizing power dynamics within a collaborative group; allowing all stakeholders a voice and equal consideration in the decision making process; fostering respect for all participants.
8. Facilitating communication between scientists and non-scientist stakeholders to make sure plans are technically sound without over riding normative beliefs and values.

9. Understanding the history of government involvement in addressing watershed issues and potential impacts on future collaborative efforts.

10. Understanding the difference between top-down versus bottom-up decision making and implications for stakeholder buy in.

11. Understanding alternative leadership/decision making structures and processes for collaboration. What structures/processes work best under what circumstances.

12. Building conflict management skills, including facilitating challenging conversations and negotiation.

13. Fostering an environment conducive to critical thinking.

14. Building trust among stakeholders.

15. Facilitating collaborative learning as a process for engaging stakeholders (both expert and lay persons) as co-learners in watershed assessment, planning, and decision making.

16. Engaging stakeholders in all stages of watershed planning, including problem definition, decision making, proposing and evaluating solutions, and adopting a plan.

17. Using information technology to facilitate communication and education (e.g., social media, web-pages, e-newsletters).

18. Educating stakeholders on how to interpret data and utilize scientific studies to inform decision making.

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