WaterMarks Project Evaluation

Year 2 Report

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Background

WaterMarks: An art/science framework for community-engaged learning around water and water management in an urban area (WaterMarks) is four-year project funded by the National Science Foundation (NSF) and based at the University of Wisconsin-Milwaukee, in partnership with City as Living Laboratory (CALL) and COSI's Center for Research and Evaluation (CRE). The primary mission of this project, which builds on an existing body of WaterMarks-branded efforts across Milwaukee, is to foster community-engaged learning and environmental stewardship by developing a framework that integrates art with science, technology, engineering, and mathematics (STEM) experiences, along with geography, water management, and social science. Specific goals within the NSF-funded work are as follow:

1. **establish and activate community-based informal science learning initiatives in six socioculturally and biophysically diverse Milwaukee neighborhoods**, focused on urban water systems and anchored by art installations called WaterMarkers.

2. **through collaboration between the project team and a Community-University Working Group, develop and disseminate an Adaptable Model Implementation Guide** for establishing a city-scale infrastructure for informal science learning on the urban environment through public art.

3. **through evaluation and research, build a theoretical model** for the relationships among science learning, engagement with the arts, and the distinctive contexts of different neighborhoods within an urban social-ecological system.

The role of CRE in WaterMarks is to conduct formative, summative, and process evaluation of the project, with the additional goal of producing evaluative research findings that can contribute to the broader field of informal learning. Throughout the funding term, CRE will provide the project team with ongoing feedback and recommendations about process and outcomes. CRE will also serve as a "critical friend" to the program and research teams in support of the project process, as well as monitoring and reporting.

As the project progresses, evaluation will include three strands of investigation:

- Strand 1 concerns **Implementation of the WaterMarks FRAMEWORK** (i.e.,the general programmatic approach developed by CALL, as implemented in Milwaukee).

- Strand 2 will explore **WaterMarks as a System of Sites,** with the specific intention of generating knowledge about the differences in implementation and outcomes in each neighborhood in relation to features of human geography.

- Strand 3 will explore **WaterMarks and the Experience of Place,** with particular attention to the degree to which and ways in which the project work is experienced by

community members who are not actively connected to WaterMarks programming.

The present document reflects a summary of available evidence about the intended outcomes of NSF-funded program activities in project Year 2, as well as commentary on how the project is using (or could use) this information moving forward. While we expect that data that can address evaluation Strands 2 and 3 will emerge from our plans (as well as those of the entire project team) in project Years 3 and 4, the work of the past year provides continued insights related to evaluation Strand 1. Our study in this domain focuses on an overarching question: **How does the implementation of the WaterMarks project support positive outcomes for the project's constituent groups and the development of an adaptable model for city-scale informal science learning about urban environments?**

Within this strand, there are three areas of investigation:

Outcomes of Programmatic Activities

a. To what extent and in what ways do Walks, Workshops, and Artist Projects appear to support science-related skills, increased knowledge of sustainable urban water resources and the environmental geography of Milwaukee, and/or increased interest in local environmental issues among *participating community residents* and *non-participating community residents*?

Presence in Milwaukee

b. How do members of the project's various constituent groups (i.e., *participating community residents, WaterMarks personnel, new collaborators,* and *non-participating community residents*) perceive the WaterMarks project and its processes of collaboration? What do they see as major challenges and successes, and how do they characterize the project's "goodness of fit" within the Milwaukee context?

Accountability to Progress

c. To what extent do the project processes and activities reflect progress toward fulfilling community commitments, accountability to the funder, and the production of a model translatable to other contexts?

It is not possible to answer these questions fully at this point in the project; instead, the present document synthesizes the progress of the past year, particularly in areas that have grown since Year 1. Future reports will continue to refine our understanding of these areas of investigation, as well as those represented in evaluation Strand 2 and Strand 3.

As in Year 1, there are some specific limitations to the scope of what this report describes. First, it only addresses programming funded by the NSF grant, and therefore does not speak directly to the significant progress made this year in WaterMarks efforts to advance the presence of

WaterMarkers and artist projects in Milwaukee. However, it is important to acknowledge the existing network of WaterMarks constituencies and plans for site activation supported by other funding sources, as these efforts have increased local visibility of the WaterMarks project substantially. In particular, the unveiling of new WaterMarkers and accompanying artist projects and online content has served to provide concrete anchors for this work, and we expect this will continue in Year 3. While we will not evaluate the outcomes of activities not funded by NSF, this work provides critical background and lessons for the NSF project, including the Walks, Workshops, WaterMarkers, and Artist Projects we expect to emerge in the four active NSF-funded WaterMarks neighborhoods.

Outcomes of WaterMarks NSF Year 2 Programming

The first sub-question for evaluation Strand 1 asks, *To what extent and in what ways do Walks, Workshops, and Artist Projects appear to support science-related skills, increased knowledge of sustainable urban water resources and the environmental geography of Milwaukee, and/or increased interest in local environmental issues among participating community residents and non-participating community residents?*

For Year 2 of the project, activities, and thus evaluation, related to this sub-question have focused on Workshops and *participating* community residents. Data sources to answer this question include artifacts of community deliberations during the Workshops, as well as responses to a questionnaire completed by participating residents after the Workshops. The target outcomes from the logic model (see Appendix) that these data collection methods aimed to help document included participants…

- expressing enjoyment of Workshops
- offering more detailed descriptions of neighborhood environments
- calling attention to more and/or different elements of neighborhood environments
- recalling relevant science content
- seeing scientific information as a tool for supporting community action
- expressing a sense of connection to sites for Markers
- feeling involved and interested in the process and goals of WaterMarks

Workshop Deliberations and Reflections

Riverwest and Harambee

The Workshop for the Riverwest/Harambee Marker took place on November 2, 2022 at Riverworks Lofts. A total of 26 participants signed in on the sign-in sheets (and several NSF-project team members were also in attendance). These Workshops are intended as an opportunity to hear directly from neighborhood residents and are designed to be led by their voices. At the Workshop, participants were asked to reflect on three questions written by a team of neighborhood residents:

1. *Are there incidents in your life where a connection with water directly impacted your life, and changed how you think about water and its use? How has your awareness of water changed from childhood to the present?*

2. *Given that many members of our community are facing immediate challenges in areas such as housing, food insecurity, rising energy cost, and voter suppression, etc. – why should we be concerned about water issues/water quality, and what impact might it have in the future?*

3. *We live in a city on a Great Lake, and in a part of the city west of the river. Yet, we often take water for granted. How can we foster an appreciation for the role water plays in our lives and our neighborhoods, especially if your house/workplace is connected to the city water supply by lead pipes?*

Participants were asked to first respond to these questions individually on sticky notes, and then split into three groups that each discussed one of the questions in-depth. After the small group discussions, the full group reconvened to share their conversations and vote on a letter for the Riverwest/Harambee WaterMarker.

Many of the participant reflections had to do with why water is important. This is not surprising given the questions posed, and while it does not exactly match with the logic model outcomes, understanding these perspectives can help the project reflect participants' knowledge and priorities and support them in feeling invested in WaterMarks. Participants described clean water as both a "human right" and "learned behavior." As one participant wrote: *It is an ethical responsibility as citizens to protect/steward natural resources – for humans, animals, and Earth*. Participants identified water as something that will have an impact on the future and questioned what impact it will have on "the kids." They also noted water's connection to health and wellness, and referenced cities that have struggled with access to clean water like Flint, MI and Jackson, MS. One participant identified that Milwaukee's location and connection to water could make it a destination for climate migrants.

Participants also identified specific water-related issues that are affecting their neighborhoods, including rising water bills and lead pipes. They discussed ways they might be able to address these issues. One way included increasing the urgency on elected officials to act regarding lead pipes. Education was also highlighted as a way to raise awareness of and address water-related issues. One participant wrote *Education from community and for community*, and another wrote *Education with engagement! Meet people where they are at*. One specific idea for education was creating school curriculum about water so students understand the value of water and become "future protectors" of water. To get information out to community members, participants identified artists as "effective voices" to take information to people. Education and art are very relevant to the

WaterMarks project's values and approach in Milwaukee, indicating some alignment between participants and the larger project goals.

Another goal of the Workshops is for neighborhood residents to select the letter for their WaterMarker. Participants at the Workshops do this by sharing words that are meaningful to them about their community, grouping them by starting letter, and then voting on a letter. The letter that participants voted in favor of for the Riverwest/Harambee Marker was **H**. Some words shared for how this letter relates to the neighborhoods included health, harmony, H_20, Harambee, and home.

Lindsay Heights

The Workshop for the Lindsay Heights Marker took place on November 3, 2022 at Innovations & Wellness Commons. A total of 14 participants signed in on the sign-in sheets (and several NSF-project team members were also in attendance). At the Workshop, participants were asked to reflect on three questions written by a team of neighborhood residents:

1. *Water is such an important resource that so many of us take for granted. Can we think about some of the reasons why we take it for granted – and why is water important?*

2. *We all interact with water every day. Can you describe some of the ways that water is important to you? In what ways can you preserve your water usage?*

3. *Water connects us to memory and healing. Can you share/recall a time in your life when water has been used to aid in the healing of sickness/disease?*

Again, participants first responded individually, then in small groups, and then as a full group. The final vote on a letter for the Lindsay Heights WaterMarker was held on a later date so more residents could be involved in the choice.

As with the Riverwest/Harambee Workshop, the questions posed prompted many reflections about the importance of water. Participants noted that "it sustains life" and that it is important for "life + recreation + community." In response to the question about taking water for granted, one participant wrote that: *Because we live close to water it is easy to take for granted*. Another participant expanded on this idea writing: *Because we may be privileged to live without drought, scarcity, [and] contaminated water*. In response to the question about healing, participants noted times they have used water to break up mucus caused by bronchitis, flush an open wound, lubricate joints, and rehydrate. One participant shared how they use water to support their mental health by swimming or soaking to decompress after traumatic events. Participants also connected water to rebirth, renewal, and baptism.

The letter community residents ended up voting in favor of for the Lindsay Heights Marker was **L.** Some words shared during the Workshop for how this letter relates to the neighborhood included Lindsay Heights, living, love, life, lawn, and listen.

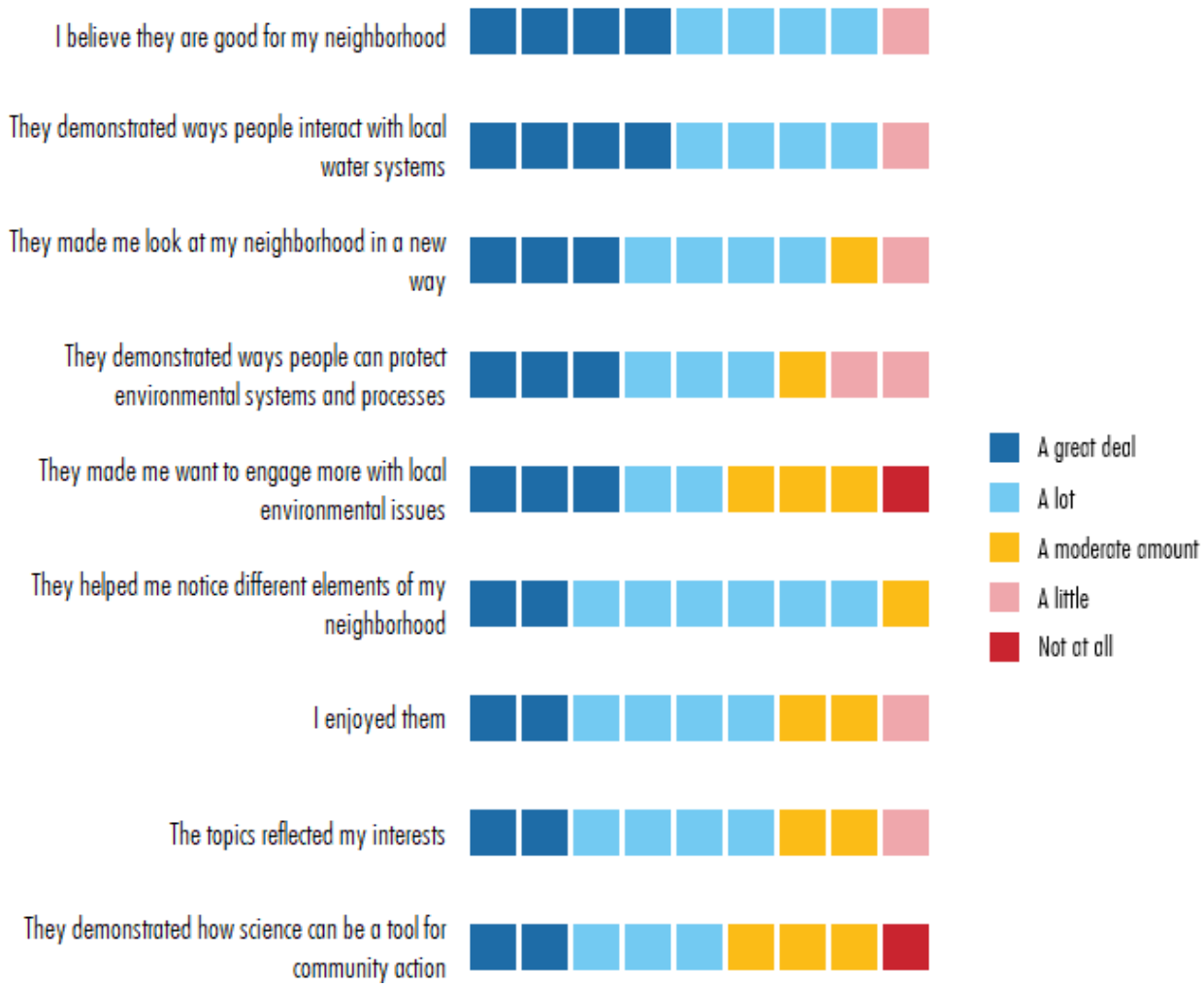
Post-Workshop Data

CRE sent an online questionnaire to participants after each Workshop. A total of 9 participants completed the questionnaire. Five of the respondents attended the Riverwest/Harambee Workshop and four attended the Lindsay Heights workshop. Due to the small sample, their responses will be reported in aggregate. Three of the respondents had also attended a Walk in the same neighborhood as the Workshop they attended, and one respondent had also viewed artist installations in two other neighborhoods.

Eight of the respondents shared demographic data. Ages of respondents ranged from 26 to 70, with a median age of 45.5 years old. Half of the respondents had completed a Bachelor's degree or higher, three had Associates Degrees, and one reported having completed some college. Half of the respondents identified their race/ethnicity as African American or Black, and half identified as white. Seven of the eight respondents identified as women.

When asked a multiple choice question about how they would describe themselves, all eight respondents selected that they enjoy spending time in nature. Three respondents also identified themselves as environmental activists and as having science-related hobbies. Two respondents identified as artists, and five responded that they enjoy looking at art.

Respondents were asked to rate their agreement with a series of outcome statements about their experiences with any Walks, Workshops, or artist installations they attended or engaged with. These statements were written to reflect the goals set out in the logic model. Ratings show that respondents generally agreed with the statements, suggesting that, at least within this small sample of participants, the outcomes were met for the Workshops.



Note: The color of each block refers to the rating given; the number of blocks for each color refers to the number of responses associated with that rating.

Figure 1. Outcome ratings from workshop participants (n=9)

Respondents were also asked to respond to three open-ended questions about environmental science and local water systems. Responses suggest that WaterMarks participants are gaining some science content and connecting with water.

<u>What water or environmental science content stood out to you from the installations or events?</u>

- *The event was light on science*
- *The cultural significance of water*
- *How we can preserve water*
- *The combination of Environmental science and possible application of artistic expression techniques stands out to me because there's lots of room for creativity.*

- *Neighborhood contributions to sewer overflows*

What are some ways that people and their activities interact with local water systems?

- *Daily life*
- *Providing bathrooms, water fountains during events*
- *Lake Michigan is used for shipping.*
- *Drinking, bathing, flushing, visiting the beach, swimming, walking along the river, fishing, ice skating*
- *The amount of water usage*
- *Installation of water barrels and bio swales to help reduce storm water runoff.*
- *Reduce water usage, especially during heavy rains*

What are some ways you can support water or environmental systems?

- *Recycle*
- *Keep my areas clean*
- *Live inside the Lake Michigan watershed.*
- *Picking up trash, limiting purchase of plastics and other items that become garbage easily, limiting water use when it's raining hard, planting native plants, introducing others to the water that sustains us*
- *Spreading information*
- *Recruiting others to make use of bio swales and rain barrels.*
- *Water conservation*

Collaborating with and in Milwaukee

The second sub-question for evaluation Strand 1 is as follows: *How do members of the project's various constituent groups (i.e., participating community residents, WaterMarks personnel, new collaborators, and non-participating community residents) perceive the WaterMarks project and its processes of collaboration? What do they see as major challenges and successes, and how do they characterize the project's "goodness of fit" within the Milwaukee context?* At this point in the project, the data that address these questions most directly have emerged through the activities of the Community-University Working Group (CUWG), described below. As the project's processes and working relationships continue to emerge, we expect to gather data from other constituencies as appropriate to their participation.

Activities of the Community-University Working Group

In project Year 2, the WaterMarks CUWG continued to hold quarterly gatherings to support their major goal of holding space to gather community voices, identify recommendations on

how best to engage neighborhood residents, make community feedback actionable, and ensure that the larger project reflects investment in and from Milwaukee. At meetings in September 2022, January 2023, and April 2023, CUWG members heard presentations from leaders within the WaterMarks project and critically reflected on discussion prompts. Though each meeting focused on different issues, prompts in each meeting were designed to build relationships, deepen engagement with the WaterMarks project, and build knowledge that can be incorporated into their major project deliverable, an Adaptable Guide for implementing art-science collaborations grounded in community and environmental stewardship. As it emerges, the Adaptable Guide is intended to articulate the key "ingredients" and approaches for developing likeminded community efforts in other contexts, as well as for grounding the existing work in Milwaukee in processes that reflect improved equity and authentic co-production.

At this point in the project, meeting artifacts are a major data source for some of the desired outcomes associated with CUWG, as articulated in the project logic model:

CUWG members…

- Feel supported by the activities of the Community-University Working Group
- Feel prepared to engage with other project stakeholders
- Understand structure, process, and goals of WaterMarks
- Understand stakeholders' concerns and priorities
- Express a sense of ownership of the project

In addition, after each formal meeting of CUWG, a member of the CRE evaluation team (typically Hayde) facilitates a semi-structured debriefing interview with the organizers of the meeting (typically UWM team members Ellie Jackson and Haley Rohr, along with CALL team member Adrián Cerezo). As information captured systematically and regularly, these interviews function to document real-time expert observations about group dynamics and progress, focused toward the specific goals of the meeting and the broader mission of the CUWG. Descriptions of and commentary about CUWG activities in Year 2 are summarized below.

September 2022

The September 2022 CUWG meeting was held at Riverworks Development Corp, a community partner and host of the Riverwest/Harambee (Beerline Trail) Neighborhood Project Team.

Stated goals for the meeting were as follow:
Discuss community engagement as it relates to Milwaukee and as it relates to WaterMarks
Continue building relationships, cohesion, trust, and general team vibes

NSF team members recapped the feedback gathered from CUWG at the end of Year 1, along wih plans to act on that feedback. From there, all present used the World Café discussion format to define "community engagement and participation" in general, in Milwaukee, and in relation to WaterMarks. Together, participants identified the following major takeaways:

1. *Engaging existing experts*
2. *Community involved = problems solved!*
3. *Engage residents from the beginning and compensate them*
4. *Capacity building – sharing resources, time, compensation, knowledge*
5. *Build relationships on respect, humility, and trust*
6. *Defining roles and actions by honoring existing roles*

By the account of organizers, the major value of this discussion was to get CUWG members thinking more deeply about their shared understandings of and goals for community engagement, all of which will be necessary framing for the Adaptable Guide.

January 2023

The January 2023 CUWG meeting was held at Arts@Large, which is located a short walk away from the first WaterMarker (installed at Acosta Middle School). In light of the project-level goal to connect more CUWG members to the programmatic elements of WaterMarks, the meeting organizers brought those in attendance on a "mini-Walk" intended to emulate what community participants would experience at one of the neighborhood Walk experiences.

In keeping with a typical Walk experiences, CUWG members were invited to informally consider the same prompts used as embedded measures in NSF-funded Walks:

- *What do you expect to get out of today's walk experience?*
- *What's something new you noticed on today's walk?*
- *What is one word that you would use to describe today's walk?*

While their responses to these questions were not collected as study data, the prompts did function to get CUWG members thinking about the learning aspects of WaterMarks programming. CUWG members were also invited to consider some additional questions devised by the organizers:

- *What are you becoming aware of about this area that you weren't already aware of?*
- *What are you learning that surprised you?*
- *How do you think residents would like to engage or would like to engage with the WaterMarkers?*
- *Can you name examples of people who would like to engage?*
- *What do you see as constraints that would limit people participating in a walk?*
- *What do you see as enablers that would make it more worthwhile for people to participate in these walks?*

After the mini-Walk, all present reflected on the experience in a combination of small group and whole group discussions. Highlights from the whole group discussion included some brainstorming about ways to connect other community art (e.g., sidewalk art) to WaterMarkers, and how to provide supportive information related to WaterMarkers (e.g., context for the larger

project, technical detail, and extension resources for educators). Discussion also focused on strategies for reaching some of the larger goals of the WaterMarks project, such as expanding youth involvement, maintaining positive relationships in Milwaukee neighborhoods, and identifying strategies for the long-term sustainability of the project.

After the meeting, organizers described the major value of this discussion as familiarizing CUWG members with WaterMarks programming and helping make the project seem more tangible. Accordingly, this work provides some evidence of progress toward supporting CUWG members' understanding of the structure, process, and goals of WaterMarks.

April 2023

The April 2023 CUWG meeting was held at the Pulaski Park Pavilion, adjacent to the site of one of the non-NSF WaterMarkers that was installed the following month.

During this meeting, NSF team members oriented CUWG members to their charge to lead the creation of the Adaptable Guide via a "state of the union" presentation. After that, those present participated in a "speed dating" activity intended to help identify a smaller team to lead the development of the Guide, as well as other opportunities for CUWG members to contribute to the success of WaterMarks. During the activity, CUWG members were organized into pairs and given a list of questions to discuss:

- *In what ways have you experienced art, science, and community participation interweaving?*
- *What community engagement have you been a part of?*
- *What community partners have you worked with?*
- *What are creative ways of co-learning you've seen work in other projects?*
- *What are creative ways of sharing a project like WaterMarks?*
- *What are non-traditional ways of communicating that have worked for you?*
- *What skills do you bring to your team?*
- *How do you want to contribute?*
- *Who is missing from your team?*

Participants then rotated partners over the course of three discussion rounds, so that they had the opportunity to converse with at least three different people; each round focused on different questions from the list. Responses from each pair of partners were documented through a combination of notes from participants and notes from organizers.

In addition to identifying skills and experiences that CUWG members bring, the notes from these discussions reflect significant momentum around bringing CUWG members more directly into the work of WaterMarks. For example, nearly everyone represented in the notes was able to identify ways they might contribute, and most answers were specific actions, as opposed to more abstract answers like "being present." These suggested contributions included things like

leveraging networks, supporting communications efforts, offering event space, and providing advisory support. Notably, creative forms of collaboration and co-learning included both learning from other projects and positive reflections on WaterMarks itself.

Above and beyond the activity's programmatic goal of identifying how individuals might support the CUWG's tasks ahead, these responses provide some evidence of progress toward outcomes among CUWG members. In particular, they suggest more preparedness to engage with the project and its audiences than has been observed in previous meetings, as well as a growing sense of ownership and investment in the WaterMarks project. Following the meeting, organizers described this meeting as a major turning point for CUWG members in terms of their personal awareness of and commitment to the project; they particularly felt that the "state of the union" presentation was helpful to communicating more clearly about the work of the project.

Additional activities

In lieu of a fourth quarterly meeting, UWM team member Ellie Jackson met individually with CUWG members to discuss their vision for the Adaptable Guide. In addition, Jackson and UWM team member Haley Rohr began researching and developing processes and frameworks to share with CUWG members as they begin their work on the Guide.

To continue the positive relationship-building that emerged in early 2023, CUWG organizers also identified and hosted several intentional opportunities for participants to gather informally around shared activities and connect with other local partners. These included Inspiration Flow, a poetry sharing event held in April 2023; a meetup at Coffee Makes You Black, an Afrocentric community restaurant and resource center, in May 2023; a trash clean-up with Friends of Lincoln Park in July 2023; and a canoeing and kayaking excursion with the River Revitalization Foundation in July 2023.

Overall Project Progress

In addition to measuring how successfully the WaterMarks project meets its intended outcomes, CRE's role on the project also involves monitoring and reporting through annual (formative) and cumulative (summative) summaries of project activities and results. This work is best summarized by the last sub-question to be addressed in evaluation Strand 1: *To what extent do the project processes and activities reflect progress toward fulfilling community commitments, accountability to the funder, and the production of a model translatable to other contexts?*

Project Milestones and Emerging Plans

In project year 2, CRE has used a combination of team observations and documentation (e.g., our project's annual report to NSF, work products assembled by other team members, etc.) to

document both where the project is right now and the project team's plans for the future. The figures in this section are intended to change with the project and map its trajectory over time; as the project work progresses, we will use the rows for project Years 3 and 4 to show our growth and identify potential areas that need attention in real time.

As shown in Figure 2, some elements of the project (the installation of WaterMarkers and neighborhood-specific programming, both of which are contingent on permissions and decisions from others in Milwaukee) have shifted to take place in project Year 3; Figure 3 provides more detail about these changes.

Although WaterMarks activities not funded by NSF are outside of the scope of this evaluation, these activities continue to provide important context for the planning decisions made within the NSF project. For example, in project Year 2, progress related to WaterMarkers reflected technical development of our NSF-funded WaterMarker poles and securing agreements with city agencies regarding ownership, operations, and maintenance. Meanwhile, WaterMarkers from earlier (non-NSF) collaborations were installed at GreenTech Station and next to the Kinnickinnic River. Although those installations were not funded by NSF, they contribute significant visibility to the NSF project in Milwaukee and are part of the larger "atlas of water" that the NSF project will explore. At the end of Year 2, there are concrete plans for the first two WaterMarkers funded by this NSF grant (in Lindsay Heights and Harambee/RiverWest) to be installed in Year 3, and both affiliated neighborhoods have a wealth of online content from artists and residents that will be linked to those installations.[1]

Project Year 2 has included continued programming in Lindsay Heights and RiverWest/Harambee via the first two NSF-funded Workshops, as described above. In project Year 2, key voices in the Sherman Park and Kinnickinnic River neighborhoods have identified the need for additional relationship-building and process development to inform programming in their neighborhoods. Of particular importance is ensuring that Neighborhood Project Teams (NPTs) appropriately reflect the full diversity of these neighborhoods; this is especially critical – and also presents specific challenges – in Sherman Park, which is substantially larger and demographically more varied than many other neighborhoods in Milwaukee. Still, significant progress has been made to build and strengthen Neighborhood Project Teams (NPTs) in these areas, and organizational partners in both neighborhoods have been meeting regularly with the NSF project team. This work has prompted novel aspects of collaboration for WaterMarks, including deliberations about how to create memoranda of understanding that would allow for more community stewardship of grant funds (e.g., via managing distribution of stipends to NPT participants). Furthermore, the CALL team has applied the lessons of Year 1 programming to produce some support documentation for NPTs that identifies clearer expectations for their timeline and checklists for all associated programming (Walks and Workshops). As described above, the project's Community-University Working Group (CUWG) has made significant

[1] https://www.watermarksmke.org/l-lindsay-heights
https://www.watermarksmke.org/h-beerline

progress in the last year to deepen members' understanding of and investment in WaterMarks, as well as to begin identifying ways that members can contribute their expertise to the project.

Figure 4 maps the ways that different constituencies and groups of people connected to the WaterMarks project have interacted with the activities and team goals for engagement in the first two years of the project. At this moment, building up participation in public-facing programs remains a particularly high priority for nearly every aspect of the project. Increasing public attendance will support the important goal of positive outcome achievement among more residents of WaterMarks neighborhoods (thereby improving the reach of WaterMarks programming). However, it is also necessary for providing early forms of community feedback to Walk leaders, bolstering interest in the public Workshops and Artist Projects that will follow in each neighborhood, and providing data to advance the project research. Despite the delays to certain programs, Year 2 has shown progress in this area via public involvement in the Riverwest/Harambee and Lindsay Heights Workshops. Furthermore, the work of CUWG organizers to familiarize CUWG members with WaterMarks programming seems to have supported more direct communication from CUWG members about various informal opportunities to connect people with WaterMarks (e.g., community meetings and events). We optimistically expect that this momentum will also be reflected in more CUWG participation in WaterMarks programs moving forward.

At the end of project Year 2, the WaterMarks NSF team has identified two new strategies for outreach and engagement that hold significant promise for improving public participation as the project proceeds. First, team transitions, and especially the departure of a team member in the key role of Project Manager for Programming and Community Engagement, have prompted the team to reflect on and reimagine what community outreach and engagement can look like. In the interim, we have identified an existing WaterMarks team member with appropriate experience and community relationships to steward high-priority tasks associated with the newly-vacant role. Looking forward, we expect to shift the location of this position to be physically based in closer proximity to other team members and to focus the role's accountabilities more on programming and communications management. Second, we hope to provide more support for the person in this role by better distributing the work of community engagement across the project. We are developing an outreach model that will leverage untapped networks and capacity by identifying one NSF team member and one CUWG member to serve as paid liaisons for each project neighborhood. These liaisons will support NPTs and the person in the (renamed) Programming and Community Engagement Manager role by staying apprised of neighborhood-specific plans for WaterMarks programs and supporting internal and external communications about them. In addition to these two strategies, the WaterMarks NSF team has adopted the norm of inviting key partners in WaterMarks neighborhoods to join specific business meetings, with the larger goal of holding space for more community members to share their work, comment on the work of the NSF team, and suggest opportunities for direct collaboration.

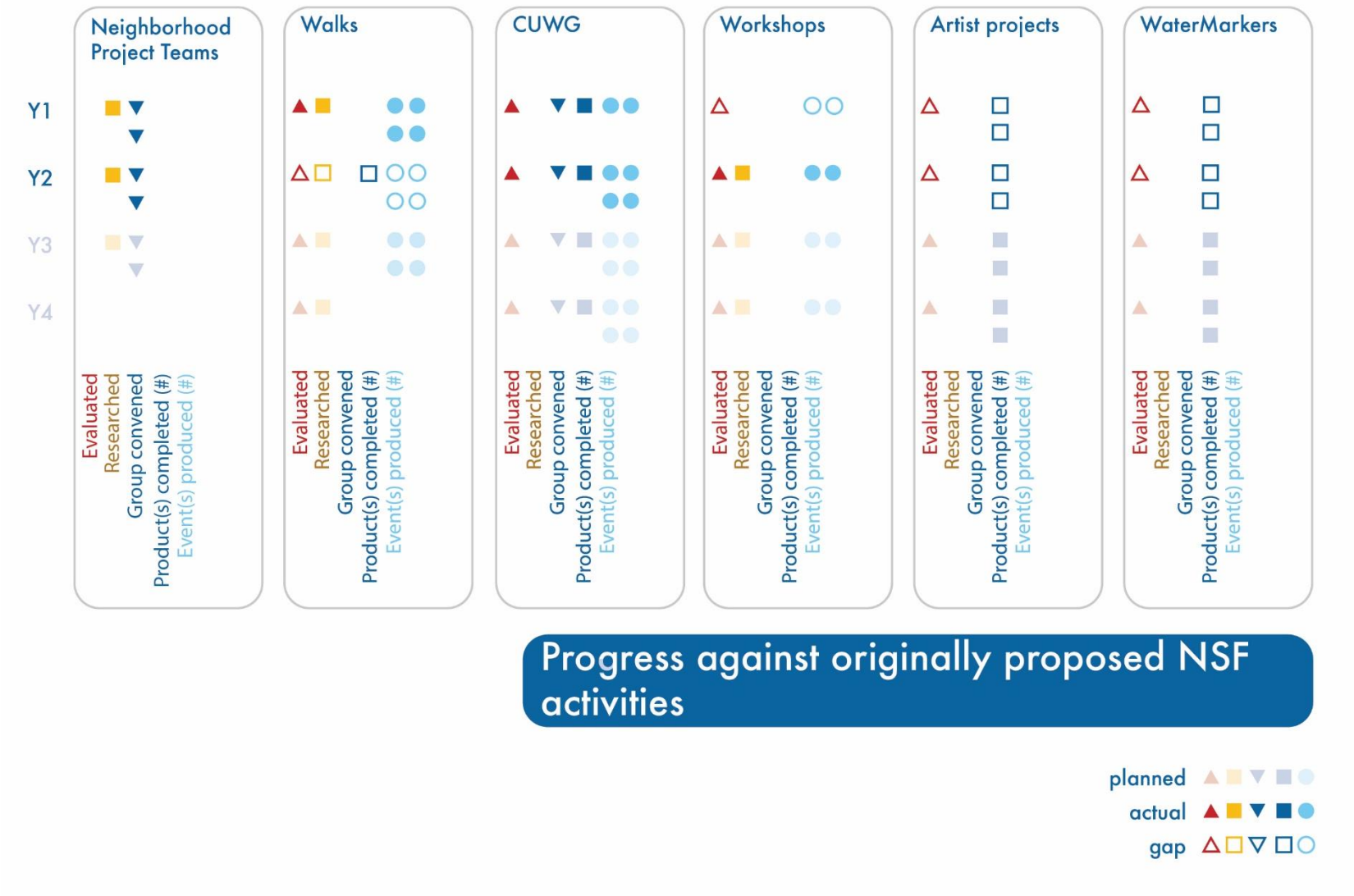


Figure 2. Project progress to date and planned actions on key activities

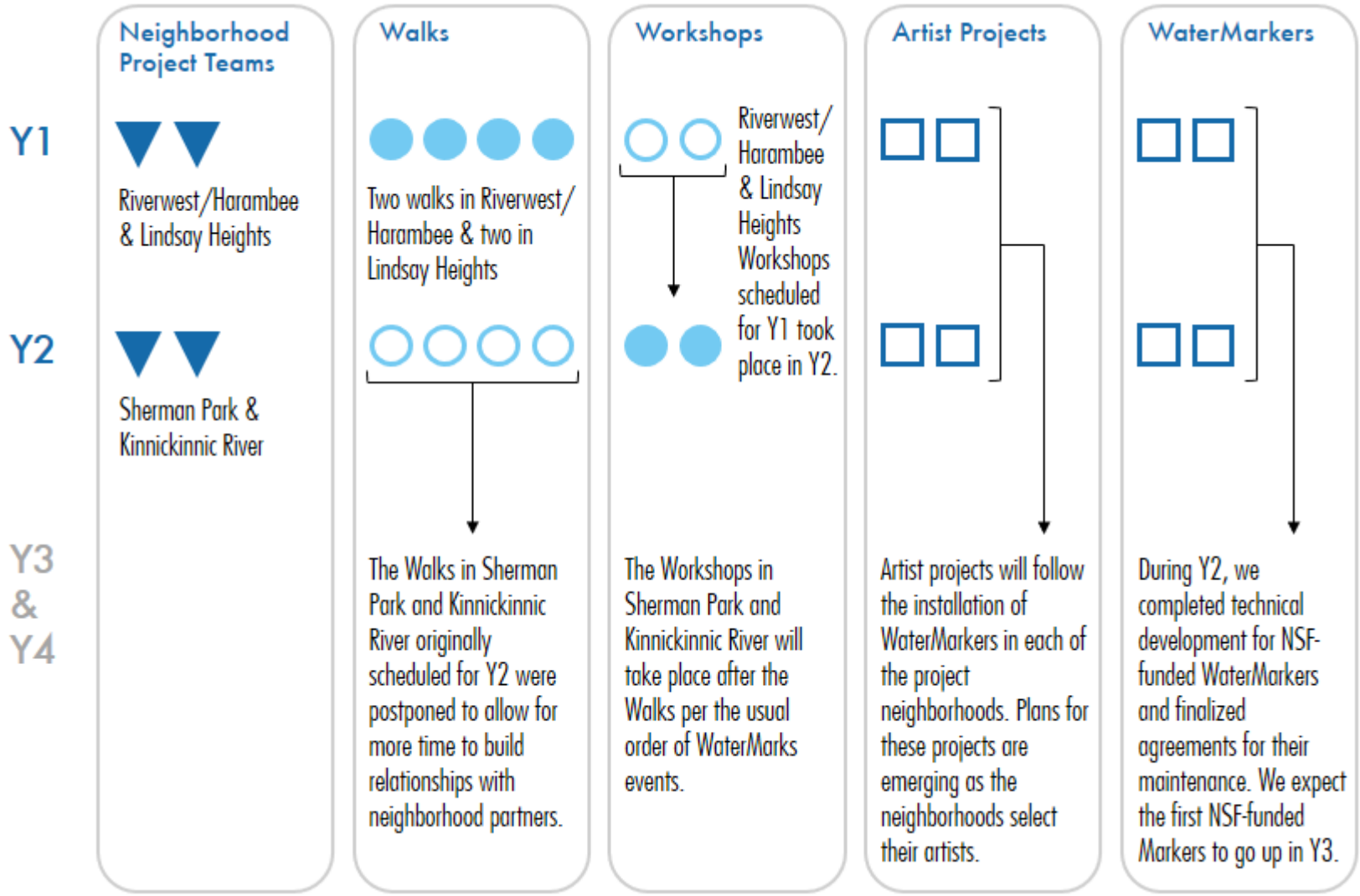


Figure 3. Changes to originally-proposed timeline

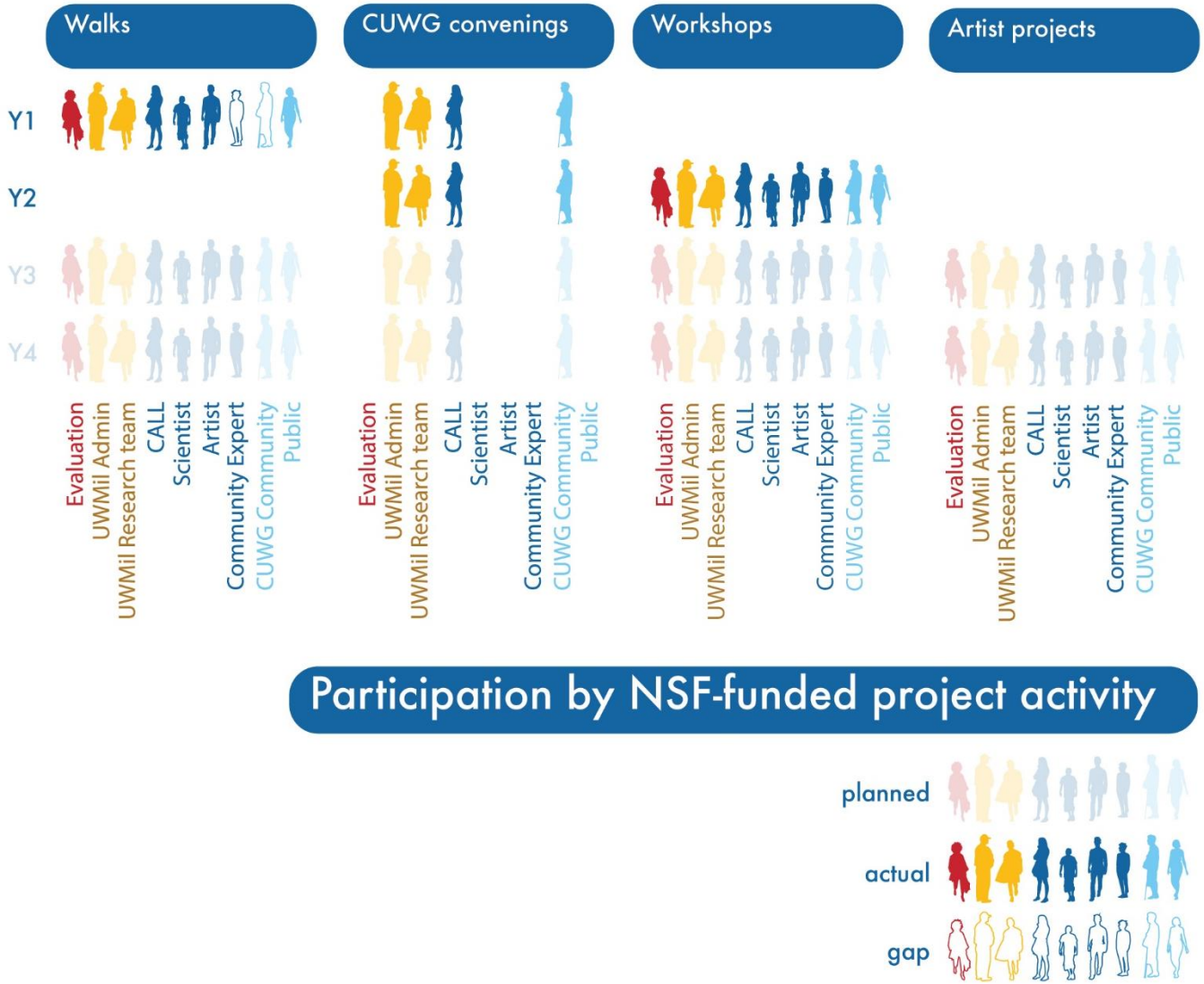


Figure 4. Participation of project constituencies in key activities

Activation Efforts

Beyond the activities originally proposed in the grant, there are also emerging efforts to contribute to the visibility and uptake of WaterMarks and to maintain existing relationships with Milwaukee constituencies. During Year 2, former CALL team member Cassandra Flagg developed the concept of "activation events," which aim to provide unique, WaterMarks-sponsored opportunities for neighborhood residents to connect with the project even when major WaterMarks programs (Walks and Workshops) are not currently happening These activities have continued with support from the UWM team and will continue as the project progresses. In Year 2, examples of these programs included a poetry workshop in the 30th Street Industrial Corridor at GreenTech Station (April 2023), a neighborhood event at Walnut Way Conservation Corp. to develop a community art proposal for Lindsay Heights (May 2023), a social gathering in Sherman Park intended to bring different community groups together (July 2023), and an art activation event with WaterMarks collaborator Sarah Gail Luther (August 2023).

In addition to bespoke activation events, members of the NSF project team have also hosted a WaterMarks table with information, opportunities to connect with the project, and/or interactive activities at a variety of existing community events. These events have included the Milwaukee Symphony Orchestra's Festival of Water, a bioblitz event sponsored by the Milwaukee Public Museum, a summer picnic hosted by the KK River Neighbors in Action, the Green & Healthy Schools Conference. These efforts included direct in-person contributions from Flagg, as well as UWM team members Ellie Jackson, Haley Rohr, Jessica Meuninck-Ganger, Woonsup Choi, and Ryan Holifield. Beyond these specific events, NSF team members listed above, along with Aaron Asis, Laurie Marks, Michael Timm, Mary Miss, Dulmini Jayawardana, and Deidre Peroff, have contributed to stewarding relationships in Milwaukee by attending community meetings and liaising with community partners in between programs.

As a major collaborator on the NSF grant, Reflo has also expanded its work beyond collecting, organizing, and sharing Milwaukee Water Stories to include novel efforts to activate WaterMarkers. Specifically, Reflo is developing digital content that provides an overarching connection between WaterMarkers and gamifies engagement with WaterMarkers by encouraging visitors to solve puzzles and visit more WaterMarkers. By finding solutions to puzzles associated with WaterMarkers, visitors will identify key ideas related to community water stories. When all the puzzles are complete, they can exchange their completed documentation of the solutions for a thematic poster. Under the leadership of team member Michael Timm, this effort will be piloted and launched in early project Year 3. As the work progresses, both the research and evaluation teams anticipate opportunities to collaborate in relation to documentation, analytics, and meaning-making.

Toward the Production of a Program Model

In addition to the programmatic work of WaterMarks, one task of the NSF-funded project is to identify the elements of a transferable model for community-based collaborations related to environment, art, and science. Ultimately, some of this work will be reflected in the Adaptable Guide developed by the WaterMarks CUWG (described above). As the project progresses, the NSF project team is also contributing to this goal via collaborative deliberations about project planning, as well as ongoing research on the project activities. As the project evaluation team, CRE has endeavored to assemble some of this to-date work as a means of demonstrating progress against this goal and as a way to document several distinct efforts for easier future reference. An important caveat to the figures that follow is that they represent the work products from ongoing discussions. Accordingly, they should not be considered complete or final; instead, they represent team thinking at key moments throughout project Year 2.

Figure 5 represents a work product from an actor mapping exercise[2] the NSF project team undertook at an in-person planning meeting held in November 2022. The purpose of the exercise was to help team members begin to describe WaterMarks in terms of a system of connections, rather than an organization or sequence of events. This purpose was identified in response to stated feelings from members of the NSF team that they lacked shared understanding of how the different constituencies of the WaterMarks project (including and beyond the NSF-funded parties) each contributed and related to one another. To begin addressing this concern, the team was invited to discuss and map their understandings. During the exercise, team members first worked in small groups to identify how different known actors (i.e., contributing people or groups, represented by sticky notes) interacted with the conceptual activities of Watermarks (represented by sections of a shared work area). They were also invited to contribute new sticky notes to represent actors who were not already listed. After small groups contributed their sticky notes to the shared work area, all present compared the placement of actors across groups and discussed the need for connections between actors. Figure 5 is the digital capture from this discussion. The arrows in Figure 5 reflect an early attempt from two of the small groups to represent some of these connections, including the need for exchange between specific actors and the reality that some of the actors represented touched each of the activities with different degrees of presence or intensity. While there was not complete consensus about team roles or this particular approach to representing the project, there was productive discussion of perceptions across the team, as well as general agreement that *more* connection between groups was desirable and that many actors on the map would necessarily occupy multiple roles and activities in order to contribute to effective collaboration.

[2] The CRE team created a facilitation agenda for this exercise that was loosely adapted from Phase III of FSG's Actor Mapping Toolkit, available here: https://www.fsg.org/resource/guide-actor-mapping/

Figure 5. Digital capture of team-generated actor map, November 2022

At the same in-person meeting, the team also participated in a storyboarding activity[3] intended to respond to a perceived need for shared meaning about how to describe the project to others. The purpose of this activity was to identify and build consensus around key ideas that define WaterMarks (reasons for doing the project, vision, approach, concrete activities), in order to move closer to concise team understanding of WaterMarks "essentials" that could flexibly support a range of communications needs across the team.

All present were provided with washable markers, glue sticks, envelopes of paper icons representing elements of the project described in the NSF proposal[4], and blank paper storyboards with the following prompts:

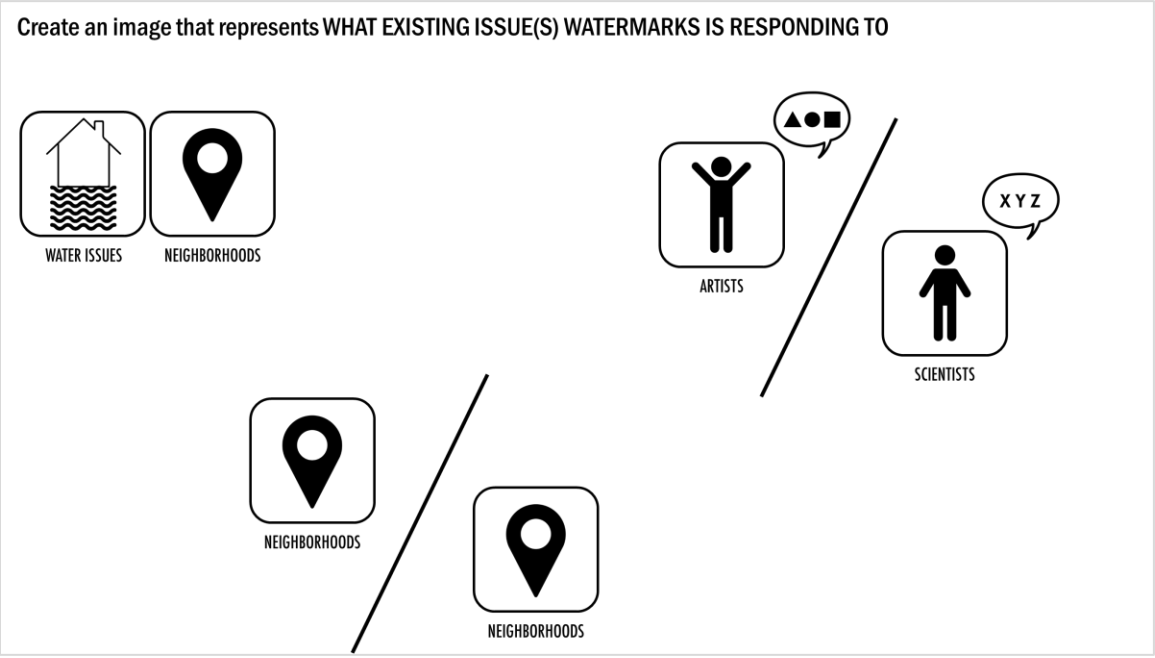
1. Create an image that represents WHAT EXISTING ISSUE(S) WATERMARKS IS RESPONDING TO
2. Create an image that represents WHAT KIND OF FUTURE WATERMARKS WANTS
3. Create an image that represents THE PHILOSOPHY AND VALUES OF WATERMARKS
4. Create an image that represents WHAT CONCRETE ACTIONS WATERMARKS INVOLVES

The prompts were introduced as modular communicative "building blocks" that could be rearranged to tailor communications for particular settings and audiences. Individuals were invited to create their own storyboards, then to try and synthesize everyone's storyboards

[3] The CRE team collaborated with CALL team member Adrián Cerezo to develop a facilitation agenda for this exercise that loosely adapted Cerezo's process for identifying key icons and metaphors to communicate complex ideas, a product of which is exemplified here: https://www.youtube.com/watch?v=RRGsU9NOlLQ

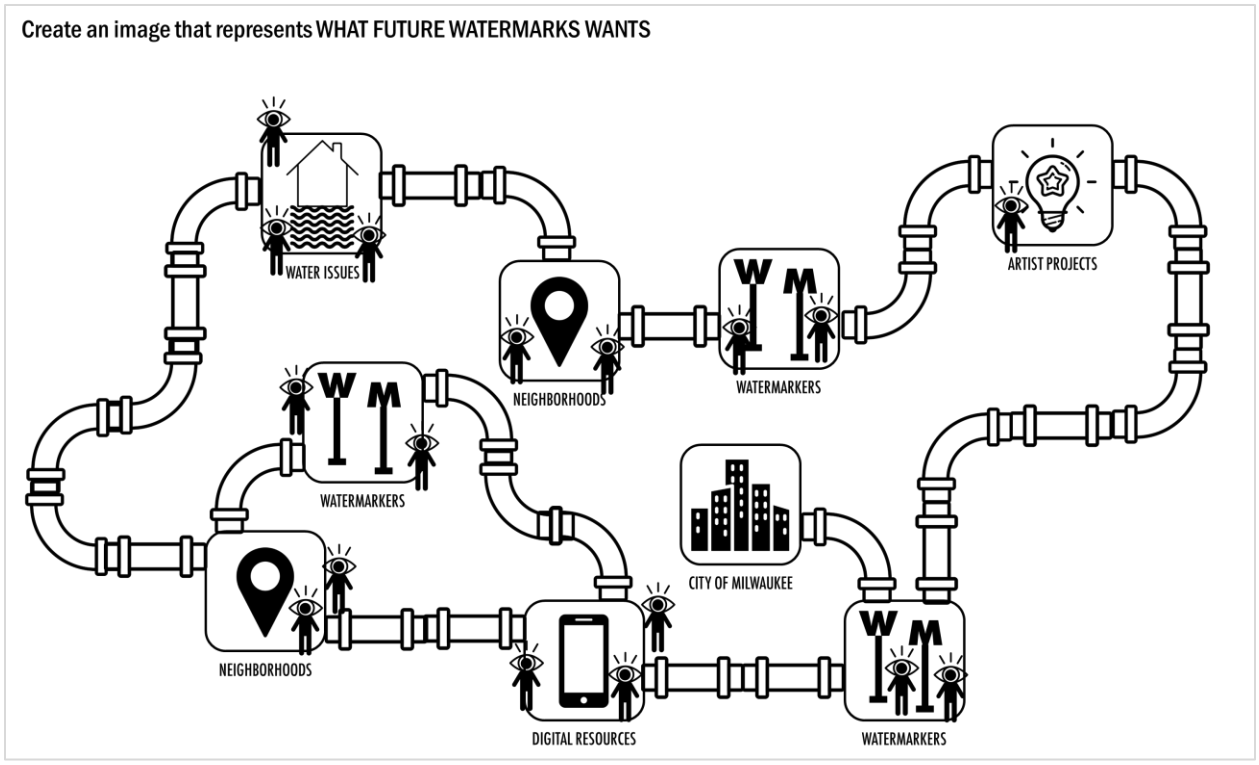
[4] The icons used for this exercise were sourced under free licenses from the Noun Project. We acknowledge the work of the following designers: Yeoul Kwon, Nithinan Tatah, Kulikov, Jugalbandi, Aybige, Alvida Biersack, Eliricon, and Adrien Coquet.

within their small groups. In both cases, team members were asked to avoid captioning their images, in order to practice working in a less-familiar modality and to encourage the team to identify shared imagery. Each small group then presented their collaborative storyboards and described what particular visual elements meant to them. The CRE team captured notes in real time and collected all of the storyboards after the session. CRE used the notes and storyboards to create a synthesized storyboard that captured elements from each of the small groups' contributions, with particular attention to elements that received positive feedback and/or consensus during the large group discussion. In January 2023, the NSF team held a virtual meeting to discuss and reflect on the synthesized storyboard by annotating it in a digital workspace on the Miro platform. Figures 6, 7, 8, and 9 reflect the synthesized storyboard developed from the November 2022 meeting, with captions reflecting additional feedback from the team gathered in January 2023. Possible applications of this work discussed to date include the development of a slide deck by others on the team to describe WaterMarks in terms of these communicative building blocks, with the goal of providing a resource that can be leveraged in outreach and dissemination efforts.



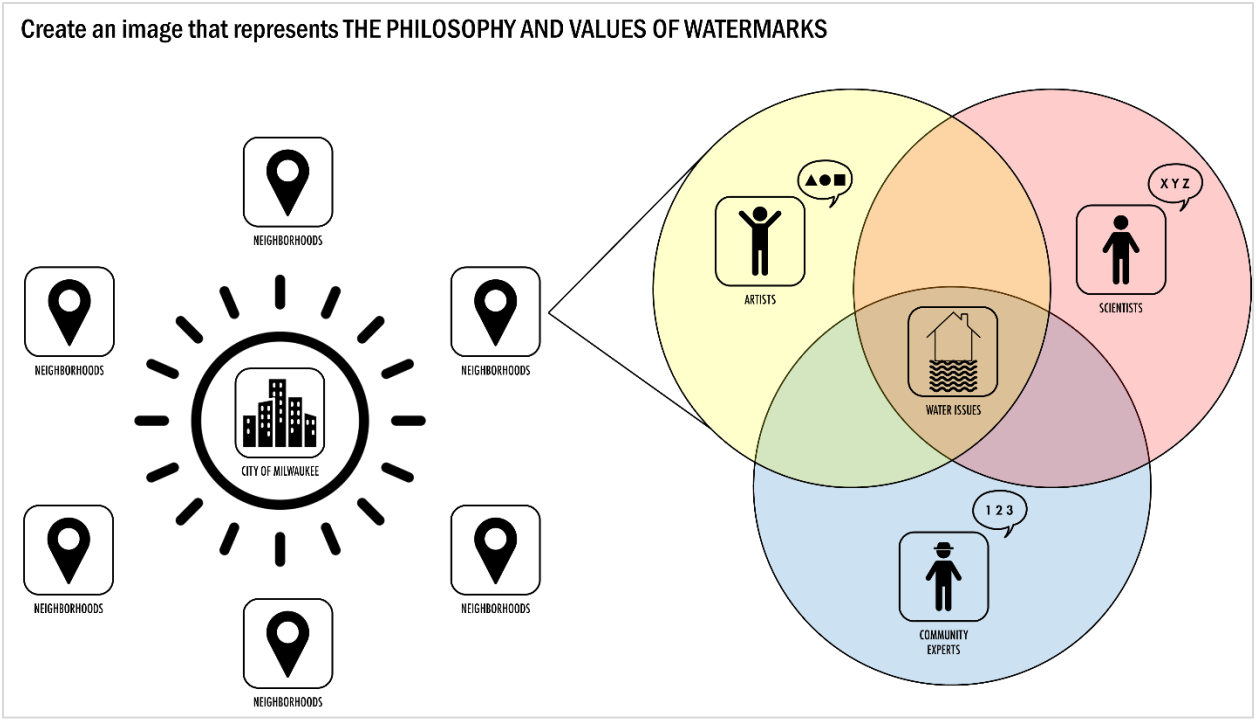
This image reflects water issues specific to neighborhoods, communication barriers between artists and scientists, and divisions between neighborhoods resulting from historical segregation and cultural differences. Feedback on this synthesis image included the desire for more specificity related to water issues, more explicit relationships between artists, scientists, and residents, more positive framing about overcoming challenges (e.g., one participant responded negatively to the term "issues") and/or the role of the WaterMarks in doing so (e.g., one participant group felt that the framing should name WaterMarks as exploring or focusing on issues).

Figure 6. Building block 1: What WaterMarks is responding to



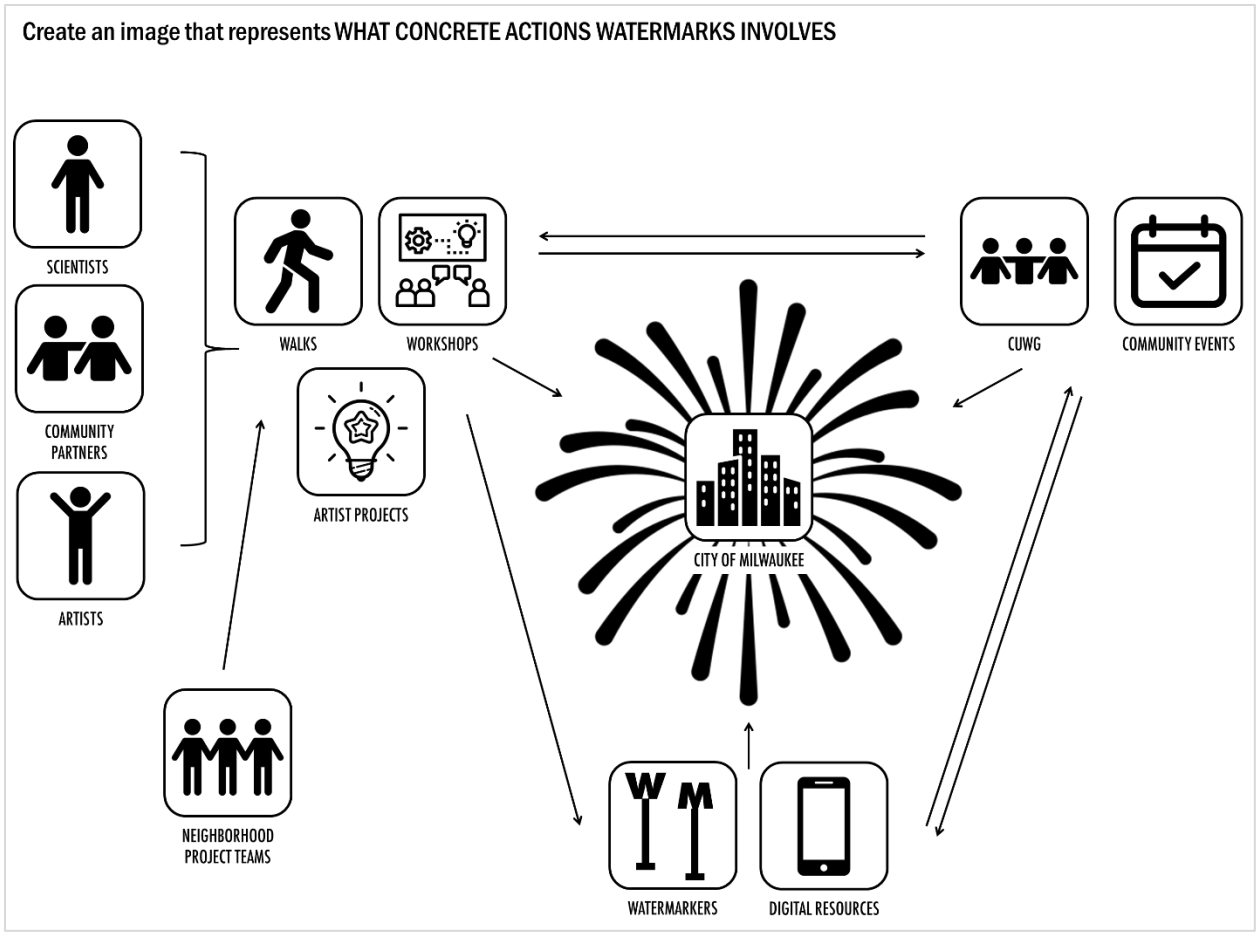
This image reflects the ideas of a connected system and flow between parts of the system, as well as visibility of water issues and resources among Milwaukee residents. Feedback on this synthesis image included the desire for more explicit inclusion of specific constituencies (e.g., scientists and community leaders) and more central inclusion of the city of Milwaukee.

Figure 7. Building block 2: The future envisioned by WaterMarks



This image reflects the ideas of shared language around water issues among artists, scientists, and community experts, in support of collective action across neighborhoods for the common good in Milwaukee. Feedback on this synthesis image included the desire for more explicit representation of project work (e.g., WaterMarkers) and Milwaukee constituencies (e.g. civic organizations and agencies). The team had notably variable responses to this image and its discrete components; some individuals felt the focus on water issues should be more central, while others preferred that Milwaukee be more central, and there was specific design feedback about the icons used to represent people (e.g., negative response to the hat in the community expert icon).

Figure 8. Building block 3: The philosophy and values of WaterMarks



This image reflects various components of WaterMarks contributing to and focusing on the city of Milwaukee. Feedback on this synthesis image included the desire for more explicit inclusion water issues and stronger connection between Neighborhood Project Teams and scientists, community partners, and artists.

Figure 9. Building block 4: The concrete actions WaterMarks involves

In the spring, the NSF team identified a need to communicate more clearly with the WaterMarks CUWG about the project, which eventually resulted in the "state of the union" presentation shared at the April 2023 CUWG meeting. To begin planning for this work, UWM team members Jackson and Rohr mapped out how the specific programmatic elements of the project intersected with different groups on the project, including those whose involvement preceded the NSF grant, such as the Activation-Content-Expansion (ACE) committee, the local WaterMarks advisory board (a distinct entity from the project's External Advisory Board), and the City of Milwaukee. Jackson and Rohr shared their graphic sketch with the NSF project team, then conferred with the CRE team about how to simplify it. Figure 10 reflects CRE's updates to the original graphic based on this discussion, which took place in March 2023.

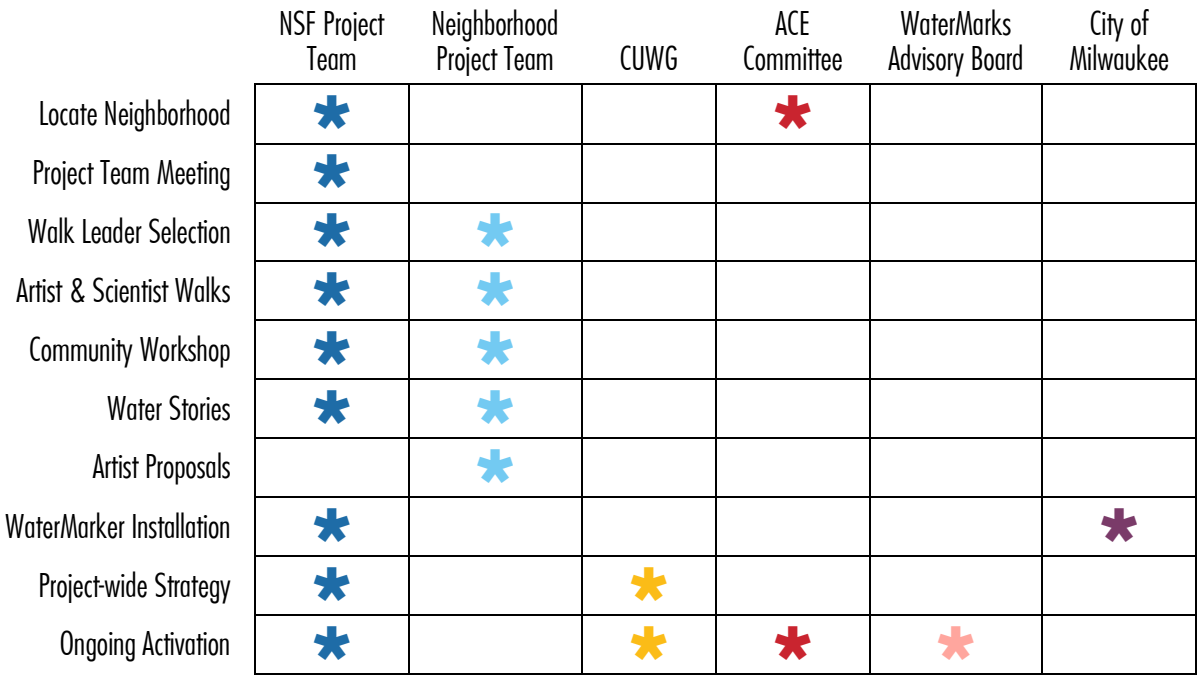


Figure 10. WaterMarks sub-groups' estimated interactions with specific program activities

In addition to the modeling activities the team has engaged in for the purposes of project tracking and planning, the research team (UWM team members Holifield, Choi, Meuninck-Ganger, and Jayawardana and Wisconsin Sea Grant team member Peroff) has worked to begin articulating ways WaterMarks might contribute to broader scholarship. More specifically, one goal of the research team is to "contribute to [Tidball & Krasny's] conceptual framework by investigating how the role of informal science learning in shaping urban social-ecological systems—with a focus on water—can be advanced and developed through engagement with visual arts activities." Figure 11 reflects early work toward this goal in preparation for the NSF project's External Advisory Board meeting in June 2023. As the project progresses, the research team will continue to explore opportunities to expand and strengthen this conceptual model with findings from the range of WaterMarks project activities.

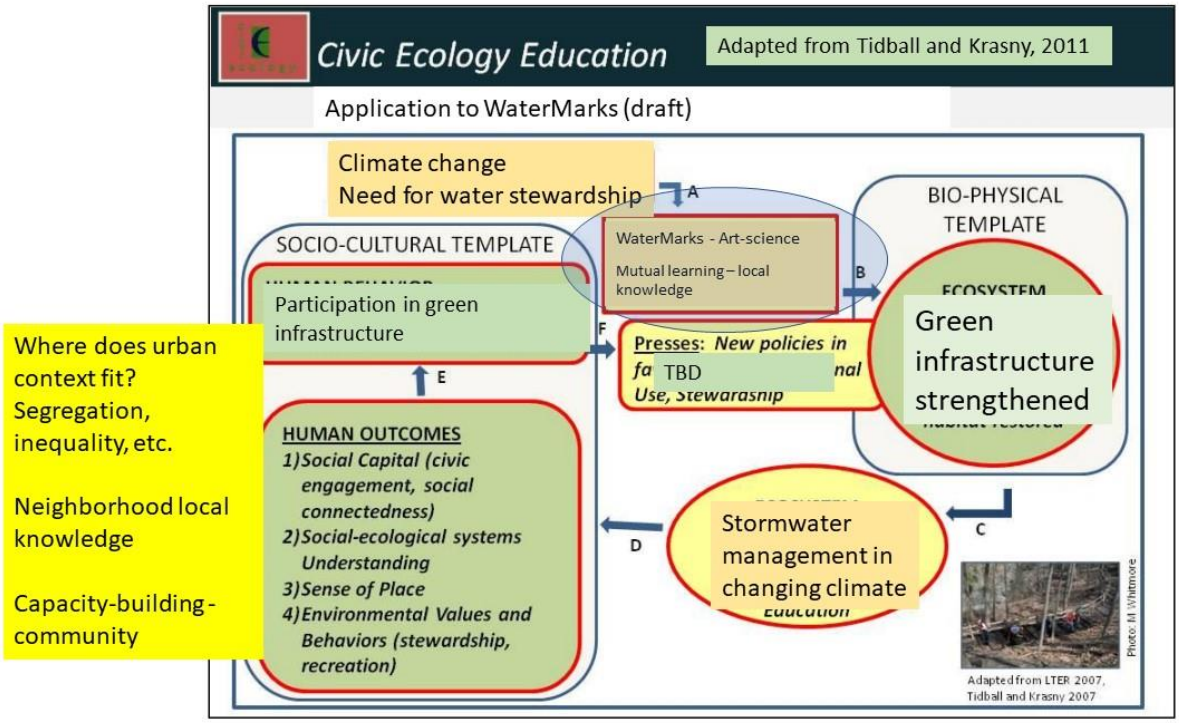


Figure 11. In-progress sketch of the research team's project model, June 2023

As these discussions evolve, the evaluation team will continue to collaborate in gathering documentation that describes how the many contributors to WaterMarks describe conceptual relationships between activities, groups, and the vision for the project. In the short term, the purpose of this work – which touches multiple project sub-groups - is moving toward processes and structures that accurately and supportively reflect the contributions of all parties; in the longer term, we hope to meaningfully support transferable learning from the project.

Observations and Recommendations for Year 3

In our evaluative function, another of CRE's project accountabilities is serving as a "critical friend" to the program and research teams in support of project processes. Concretely, this means offering real-time feedback, but also synthesizing key areas of challenge and opportunity that can help move the project forward. At the end of project Year 2, the team has raised a number of key takeaways from the project's efforts:

- **Moving programmatic efforts, including the construction of more physical WaterMarkers, forward is an extremely high priority for the project, even as we are identifying new programming needs and making a plan to meet them.**

- The NSF project team is currently working to create structures that balance the dual accountabilities of timeliness and attention to relationship-building and co-production. One emerging convention is building intentional redundancy into team roles related to stewarding relationships with entities involved in the project, so that responsibility for activities is shared and so that extenuating circumstances do not delay programs.

- The introduction and continuation of activation efforts in neighborhoods where WaterMarks has an existing presence seems to be supportive of participants and of greater visibility for the project. This category of effort may represent a rich area for discussion and documentation as a "lesson learned" that could be included in the project's Adaptable Guide.

- As programs proceed, it remains important to encourage broad and deep participation among community members. To do this, the team members working on outreach may need to identify additional opportunities and barriers in reach and accessibility. For example, what can we do to make our programs more (and more clearly) accessible and valuable to the audiences we would like participate? In situations where we may not be able to reach large numbers in programming, how can we make WaterMarks experiences as meaningful as possible, or more likely to have secondary impacts (e.g., participants sharing the project with their networks)?

- It may also be helpful to remember that the aspiration for WaterMarks to reflect a network of resources might mean that it is used by specific constituencies when it is top of mind or can be most helpful to them (e.g., in relation to specific emergencies or vulnerabilities, or if there are specific opportunities for cross-neighborhood collaboration). Therefore, it may be appropriate to consider targeted outreach about WaterMarks in situations where we expect WaterMarks resources to be particularly relevant or useful.

- **As in the previous year, the need to manage change within the project team has represented an opportunity for reflection and creative problem-solving.**

    - In Year 2, this has meant reimagining the ways the project might distribute the responsibility and workload associated with programming and outreach, considering ways to build more connections across the team and to diversify the perspectives brought forward in project meetings, and devising ways to increase neighborhood agency over funds and programming. These efforts each hold significant promise to move WaterMarks closer to realizing its vision; accordingly, the work of Year 3 will likely require consistent, continued attention to these efforts and stewardship of the tasks associated with them. In addition, it feels important for the team to take lessons learned from weathering team transitions and apply them to any similar future needs.

- **Across programming, evaluation, and research, Year 2 has revealed both a need for and opportunities to advance a more holistic understanding of "what counts" as evidence and what resources various collaborators (including those not formally on the NSF team) bring to the project.**

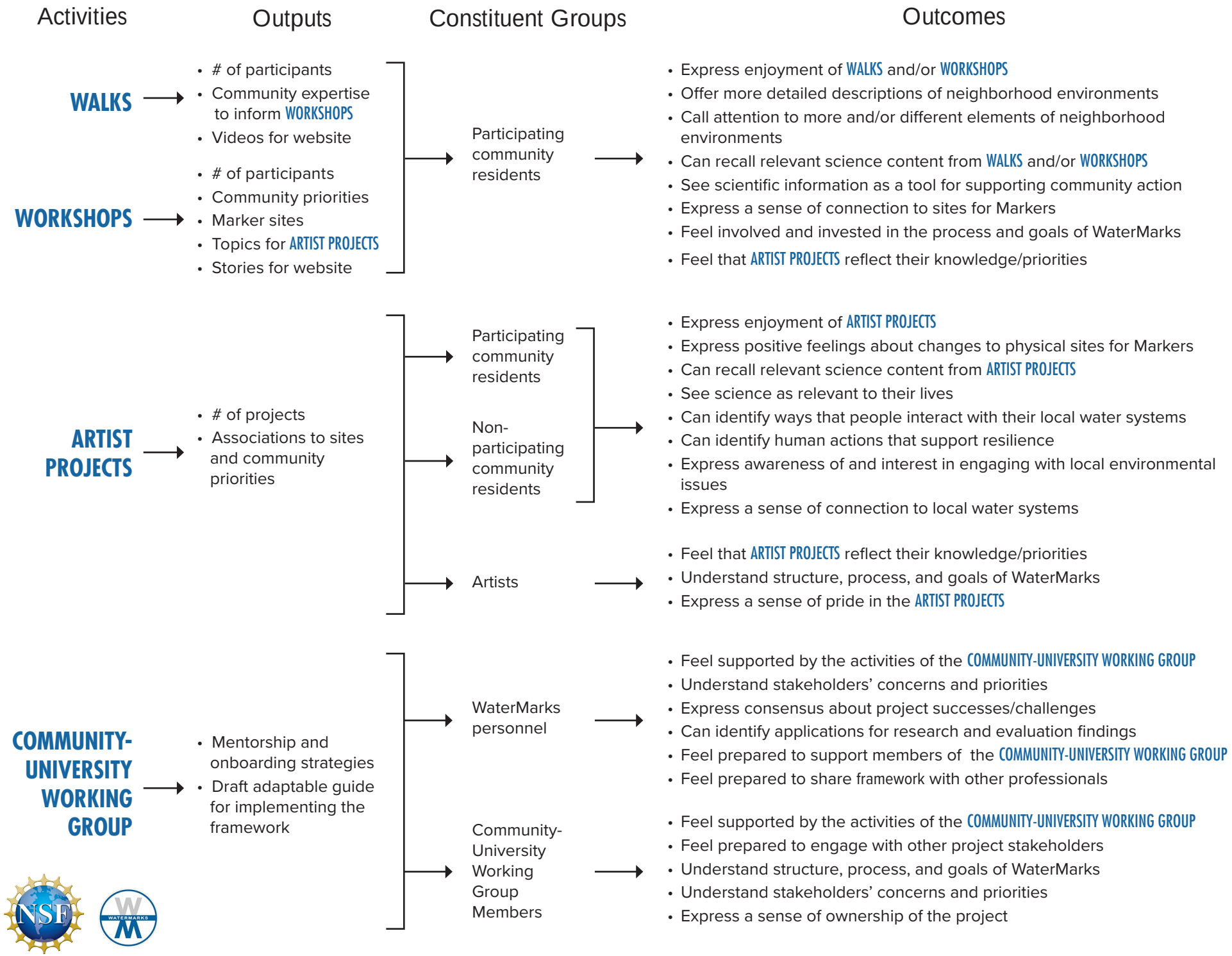
    - Looking ahead, it seems likely that Year 3 will include significant cross-pollination across sub-groups, with members of the research team contributing to outreach, members of the evaluation team continuing to support planning and facilitation, members of the programming team continuing to support data collection, members of Neighborhood Project Teams more directly managing resources, and members of CUWG contributing their specific skills, resources, and networks. As this work unfolds, there may be emerging norms related to how to acknowledge and compensate the material contributions of many people. It will be important for the NSF team to remain attentive to this issue in order to steward positive relationships across the project. Furthermore, there may be more opportunities for exchange across the project. For example, how might we use emerging efforts to model the WaterMarks project to inform what is happening on the ground, and how might that differ from what elements can inform the broader field?

- **The project's Community-University Working Group demonstrated significant progress toward its goals in Year 2.**

    - By solidifying relationships and shared understanding of the project within CUWG, organizers have built momentum to realize several important goals in Year 3, such as leveraging CUWG members' community networks and beginning the concrete work of developing the Adaptable Guide. As this work proceeds, it may be important to consider ways to extend and continue applying strategies that seemed to work especially well for CUWG members in Year 2. In particular, grounding asks of CUWG members in concrete, specific detail about WaterMarks activities seems to be supportive to the relatively abstract tasks associated with identifying big-picture strategy. In addition, the social aspects of how team members have brought CUWG members together may hold some lessons for other areas of WaterMarks effort.

Appendix: Logic Model

In January 2022, the evaluation team facilitated a session in which the entire NSF project team contributed to revisit and refresh the project logic model. We will continue to revisit the logic model as appropriate over the course of the project; however, for the purposes of the present document, the outcomes reflected here function as the core ideas being measured by participant- and team-level evaluation.


Activities
Outputs
Constituent Groups
Outcomes
WALKS
# of participants
Community expertise to inform WORKSHOPS
Videos for website
WORKSHOPS
# of participants
Community priorities
Marker sites
Topics for ARTIST PROJECTS
Stories for website
Participating community residents
Express enjoyment of WALKS and/or WORKSHOPS
Offer more detailed descriptions of neighborhood environments
Call attention to more and/or different elements of neighborhood environments
Can recall relevant science content from WALKS and/or WORKSHOPS
See scientific information as a tool for supporting community action
Express a sense of connection to sites for Markers
Feel involved and invested in the process and goals of WaterMarks
Feel that ARTIST PROJECTS reflect their knowledge/priorities
ARTIST PROJECTS
# of projects
Associations to sites and community priorities
Participating community residents
Non-participating community residents
Express enjoyment of ARTIST PROJECTS
Express positive feelings about changes to physical sites for Markers
Can recall relevant science content from ARTIST PROJECTS
See science as relevant to their lives
Can identify ways that people interact with their local water systems
Can identify human actions that support resilience
Express awareness of and interest in engaging with local environmental issues
Express a sense of connection to local water systems
Artists
Feel that ARTIST PROJECTS reflect their knowledge/priorities
Understand structure, process, and goals of WaterMarks
Express a sense of pride in the ARTIST PROJECTS
COMMUNITY-UNIVERSITY WORKING GROUP
Mentorship and onboarding strategies
Draft adaptable guide for implementing the framework
WaterMarks personnel
Feel supported by the activities of the COMMUNITY-UNIVERSITY WORKING GROUP
Understand stakeholders' concerns and priorities
Express consensus about project successes/challenges
Can identify applications for research and evaluation findings
Feel prepared to support members of the COMMUNITY-UNIVERSITY WORKING GROUP
Feel prepared to share framework with other professionals
Community-University Working Group Members
Feel supported by the activities of the COMMUNITY-UNIVERSITY WORKING GROUP
Feel prepared to engage with other project stakeholders
Understand structure, process, and goals of WaterMarks
Understand stakeholders' concerns and priorities
Express a sense of ownership of the project
NSF
WATERMARKS

WaterMarks Goals Not Being Measured as Part of the NSF-Funded Project

- Grow an active, vital, and relevant community/culture of practice that helps WaterMarks evolve and become ever more connected to Milwaukee
- Create more environmental stewards/ambassadors in communities of color
- Develop a process to create opportunities for blue/green jobs
- Increase equitable democratic community engagement