Mississippi River Water Journey Camps

Evaluation Report

August 10, 2017

INSTITUTE ON THE ENVIRONMENT
UNIVERSITY OF MINNESOTA
Driven to Discover℠

Prepared by Institute on the Environment
By Jonee Kulman Brigham, Senior Research Fellow
and Beth Mercer-Taylor, Sustainability Education Coordinator

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND

Funding for this project was provided by
the Minnesota Environment and Natural Resources Trust Fund
as recommended by the Legislative-Citizen Commission on Minnesota Resources (LCCMR).

Table of Contents

Evaluation Executive Summary

Background

"Water Journey Camps" get children outdoors exploring the natural environment, doing service plantings, and teaching the public how to conserve water and improve water quality to help protect natural areas. Two different one-week summer camps: "Water Journey: Drink" and "Water Journey: Rain," are held twice each (a total of four camps) at the St. Paul campus of the University of Minnesota. The camps serve youth ages 6-8 and 9-11 and are part of the University of Minnesota Recreation & Wellness Summer Youth Program.

Funding for this project was provided by the Minnesota Environment and Natural Resources Trust Fund as recommended by the Legislative-Citizen Commission on Minnesota Resources (LCCMR).

The project is led by Institute on the Environment, University of Minnesota with a team of collaborators and supporters within and beyond the University. Please see the team list as well as other project materials at the project website: waterjourneycamps.blogspot.com

Evaluation

Based on the grant goals, student, parent, staff and partner feedback, as well as the wider reception by educators and the public, the Mississippi River Water Journey Camps were a success. The design of the grant as a model to be repeated in following years, offers the opportunity for improving the camps each year, as was already done in summer 2017.

Each summer of camps has its own outreach and dissemination activities through the camper families, partners, and Institute on the Environment communications resources, so that the outreach and dissemination that are built into the camp design continue and can engage more people over time in learning about this model and how to protect the Mississippi River.

"…Being able to have the experiential piece of trying to help lift a manhole cover, or going into the water treatment plant, or helping with wetland plantings is invaluable. Most kids learn best through tactile, hands on learning, and this is a great format and opportunity in which to do that." —camp program staff

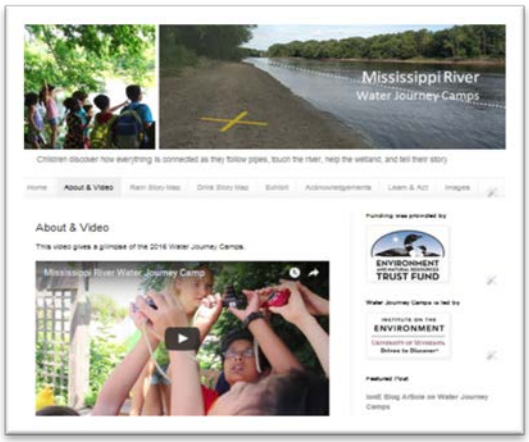
"The project looks very effective for public education because of how holistic and personable it is."
—participating public water educator

Highlights:

- Participants showed increases in water system awareness, connections to the Mississippi River, stewardship attitudes and skills
- Camp model was delivered to educators and the public online through the website and its resources, a professional video, GIS Story Maps, campers' photos and artwork, and the art-science exhibit held during the summer.

Additionally

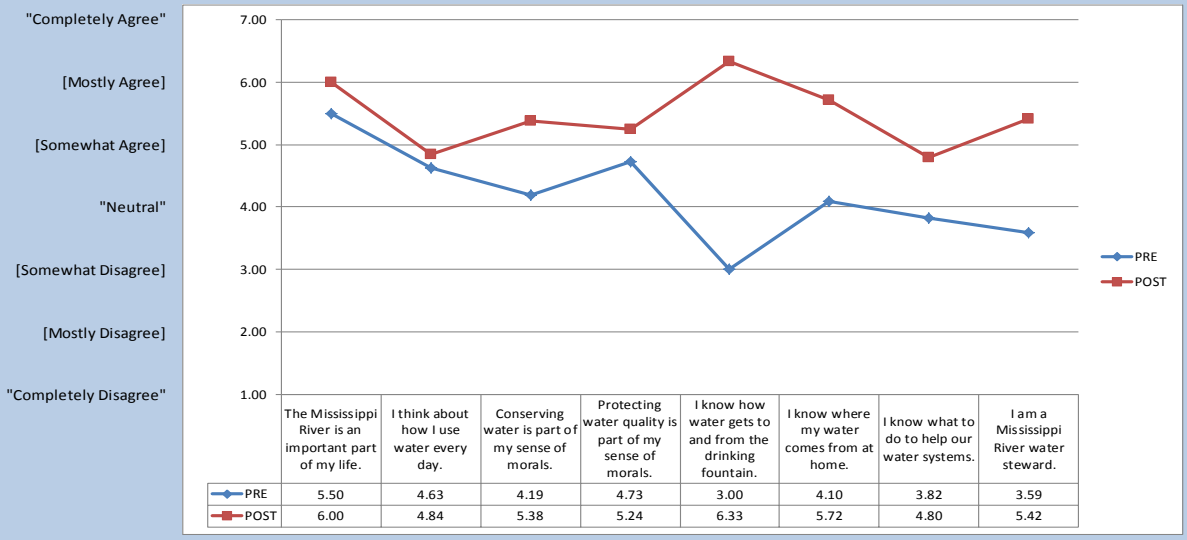
- Presentations to educators were made both locally and nationally
- Presentations to the public, included presence at the EcoExperience at the Minnesota State Fair, as well as exposure through the networks connected to partners and Institute on the Environment



"Any time you give a child the ability to educate their parents on a particular issue, you create a huge impact in public education. Parents take their kid's interests, education and concerns very seriously. They will be more likely to think about it too as time goes on. " —co- instructor

Excerpt from Detailed Evaluation Results:

Average agreement with statements about water value, knowledge, and conservation attitudes



	The Mississippi River is an important part of my life.	I think about how I use water every day.	Conserving water is part of my sense of morals.	Protecting water quality is part of my sense of morals.	I know how water gets to and from the drinking fountain.	I know where my water comes from at home.	I know what to do to help our water systems.	I am a Mississippi River water steward.
PRE	5.50	4.63	4.19	4.73	3.00	4.10	3.82	3.59
POST	6.00	4.84	5.38	5.24	6.33	5.72	4.80	5.42

Recommendations

Recommendations remaining after the logistics and design improvements already made in the camp's second year are refinements to improve areas such as: ability to measure progress in desired outcomes by fine tuning survey questions, further simplification and streamlining for more focus on the most essential elements, and continued outreach and dissemination to educators and the public.

Introduction

"Water Journey Camps" get children outdoors exploring the natural environment, doing service plantings, and teaching the public how to conserve water and improve water quality to help protect natural areas. Two different one-week summer camps: "Water Journey: Drink" and "Water Journey: Rain," are held twice each (a total of four camps) at the St. Paul campus of the University of Minnesota. The camps serve youth ages 6-8 and 9-11 and are part of the University of Minnesota Recreation & Wellness Summer Youth Program.

Funding

Funding for this project was provided by the Minnesota Environment and Natural Resources Trust Fund as recommended by the Legislative-Citizen Commission on Minnesota Resources (LCCMR). The Trust Fund is a permanent fund constitutionally established by the citizens of Minnesota to assist in the protection, conservation, preservation, and enhancement of the state's air, water, land, fish, wildlife, and other natural resources. The initial investment established the camp design, content, materials, and approaches so that it is set up to repeat within the structure and fee system of the youth camp program. The first camps were in summer 2016.

Background

The camps use an engaging arts/science adventure approach, called Earth Systems Journey, designed to bridge a gap between environmental education focused on conservation behavior and environmental education focused on downstream impacts of conservation. By revealing the water infrastructure that connects daily use of water with what happens at the other end of the pipes, conservation lessons can be made more relevant to students' experience. The camps are designed to address four areas that research indicates enhance stewardship behavior. (1) Children need more opportunities for outdoor experiential environmental education to form bonds with nature. (2) People must see the connection between their actions in the human-built environment and the associated impacts in the natural environment. (3) Children need opportunities to contribute through service activities and using their learning to help others in order to enhance their stewardship competence and identity. (4) Children and the public they will help educate need to have local, place-based examples of how their actions affect the natural areas in their community to increase the immediacy and relevance of stewardship.

Goals

The grant goals and outcomes of Water Journey Camps were:

1) Participants (the children who are campers) will gain first-hand knowledge of how they depend on and impact freshwater, the way that infrastructure carries water into and away from their homes and schools, the benefits of healthy wetlands, lakes and rivers, and will develop inspiration and skills for stewardship. This will impact 32-56 campers in the project period, with an estimated additional 128-224 campers affected in the four years of camp this project makes possible after the project period.

2) Water Journeys will serve as a demonstration to formal and informal educators for how integrating STEM skills, arts, storytelling and experiential learning develops in children an awareness of water and of how to live more sustainably by conserving and keeping water clean. The project will be shared to educators through targeted outreach and dissemination, including a website and short video that will be created.

3) Through the work of Institute on the Environment's communications team—who will make use of participants' artwork, stories and service projects—the public, and particularly the St. Paul campus and its immediate neighborhood will become a more water-aware, sustainable community through the Water Journeys programs taking place in indoor recreational spaces, outdoor classroom spaces, field trip locations and at the St. Paul campus Sarita wetland and pond, which is also a location for service learning.

Contacts

The project is led by Institute on the Environment at University of Minnesota with a team of collaborators and supporters.

INSTITUTE ON THE ENVIRONMENT
UNIVERSITY OF MINNESOTA
Driven to Discover℠

For more information about the team, the planning, or design of the Mississippi River Water Journey Camps see the project website at
waterjourneycamps.blogspot.com
or contact Beth Mercer-Taylor or Jonee Kulman Brigham

For more information about the camp program in which water journey camps are held please see:
University of Minnesota Recreation & Wellness Summer Youth Program

Evaluation Scope and Process

Evaluation Scope From Grant:
"…evaluation will include feedback from project partners, camp staff, advisory group members, and the public on project effectiveness for student learning, and public education. The students will participate in a simple pre-post survey to assess changes in their awareness, skills and concern related to the water issues they have explored. These materials help in future implementation of the camp, both in future iterations within the Summer Youth Program, as well as in dissemination of the camp as a model for other educators in informal or in school settings."

The goals and outcomes of Water Journey Camps are described earlier. They are evaluated in the following ways:

1) Participants: Participant outcomes were evaluated based on participation level and the results of the pre-post surveys. These outcomes are detailed in the section on Goal 1.

2) Demonstration / Dissemination of model to formal and informal educators
   The project was shared to educators through targeted outreach and dissemination, including a website, video, exhibit, and selected presentations. These activities are described in the section on Goal 2.

3) Educate Public about water issues and camp model
   The project was shared to the public through targeted outreach and dissemination, including a website, video, exhibit, and selected presentations. These activities are described in the section on Goal 3.

Note that while some mention is made of improvements incorporated into the second year 2017 camps and resulting outcomes, that the 2017 camps and their evaluation are not part of the grant scope. These improvements in 2017 camps are merely described to show the use of the evaluation process for the granted 2016 camps.

Goal 1 Evaluation: Camper Participant Outcomes

Participant Goal From Work Plan: *1) Participants (the children who are campers) will gain first-hand knowledge of how they depend on and impact freshwater, the way that infrastructure carries water into and away from their homes and schools, the benefits of healthy wetlands, lakes and rivers, and will develop inspiration and skills for stewardship. This will impact 32-56 campers in the project period, with*

an estimated additional 128-224 campers affected in the four years of camp this project makes possible after the project period.

Camps Participation Level

Participation level in 2016 was high at 55 campers out of 56 spaces for the set of four camps. The grant was intended to make future camps possible after the grant period. At the time of this report, the 2017 set of four camps have already taken place, with good participation at 45 out of 56 spaces. These camps made use of much of the feedback and evaluation results from the first year. The University of Minnesota Recreation & Wellness Summer Youth Program is very pleased with the camp, and Institute on the Environment remains committed to coordinating it in the future, so the intended four years of camps following the initial camp are still planned, and offer an opportunity to refine the design over time, as well as offer the experience to over 200 campers.

Drink Camps Pre and Post Survey Results

Participants in the Drink Camp were asked to take a pre-survey at the beginning of camp, and a post survey at the end of camp. The questions were about **their awareness of drinking water systems, the value they place on the Mississippi River, and their identification with water conservation and protection statements.** The results from the pre/post surveys of drink camp participants are described below.

This is a picture of the Drinking Fountain in the camp building.

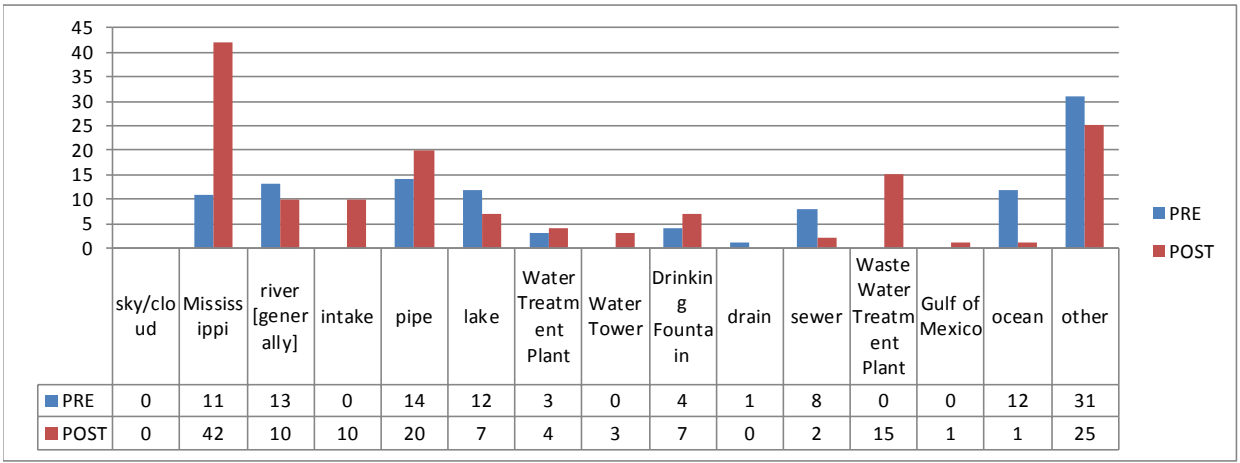
Awareness of drinking water/sanitary sewer water cycle

The drinking fountain at the camp location was the local reference point for the “drink” water journey. In the pre and post tests, participants were shown a picture of this water fountain and asked several questions related to the water cycle upstream and downstream from this fountain. The goal was to use multiple questions to draw out a more complete story of water from the campers. The responses to the

first 6 questions are combined to determine the number of times different elements of the water cycle were mentioned compared to the major elements that were included in the camps.

Figure 1. Drinking/Sanitary Sewer Water System Awareness

Number of mentions of elements of local water system in response to questions:
Where does the water come from?
How does it get to the drinking fountain?
Where does the water go after it goes in the drain of the drinking fountain?
What happens next?
What happens to the water all along the way?
Where does the water end up?



	sky/cloud	Mississippi	river [generally]	intake	pipe	lake	Water Treatment Plant	Water Tower	Drinking Fountain	drain	sewer	Waste Water Treatment Plant	Gulf of Mexico	ocean	other
PRE	0	11	13	0	14	12	3	0	4	1	8	0	0	12	31
POST	0	42	10	10	20	7	4	3	7	0	2	15	1	1	25

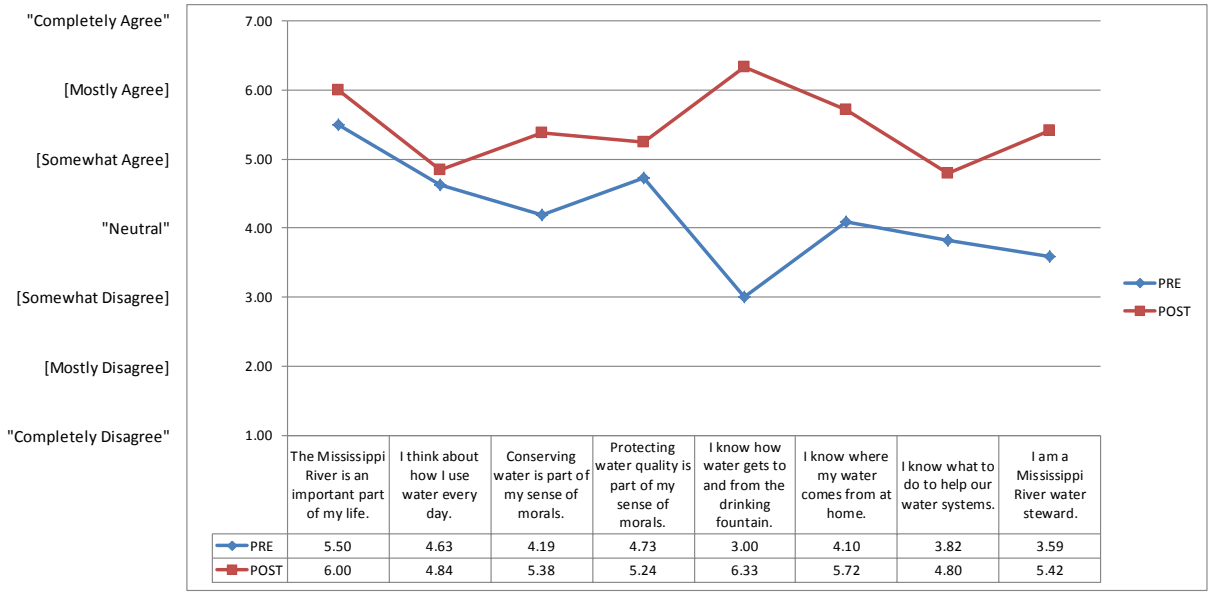
River Awareness Observations: Pre-camp, there were 11 mentions of the Mississippi River, and 13 mentions of the "river" generally for a total of 24 river-related mentions. Post camp there were 42 mentions of the Mississippi River, and 10 mentions of the "river" more generally for a total of 52 river-related mentions. This is over twice the number of river mentions.
Interpretation: There appears to be an increased awareness of the Mississippi River as part of the drinking and wastewater system.

Water infrastructure Awareness Observations: While there were some mentions both pre and post camp that rivers, lakes, pipes, water treatment, and sewers may be involved in the local water system, there were no pre-camp mentions of the interface of the water infrastructure system with the river. Post-camp, there were more mentions of the intake (where water is taken in from the river before water treatment) and the waste water treatment plant (where sewage is treated before being re-released to the river).
Interpretation: Their appears to be an increased awareness of the connection of the drinking and waste water infrastructure to the Mississippi River.

River and water value, water knowledge confidence, and conservation attitudes

A number of questions were asked about water values, awareness, and conservation attitudes. To compare pre-tests and post-tests, the graph, below, plots the average degree of agreement for each, represented on a scale from 1-7 where 1 is “Completely Disagree” and 7 is “Completely Agree.” Depending on the question, between 21-24 campers responded in the pre-test, and 24-25 in the post-test.

Figure 2. Average agreement with statements about water value, knowledge, and conservation attitudes



	The Mississippi River is an important part of my life.	I think about how I use water every day.	Conserving water is part of my sense of morals.	Protecting water quality is part of my sense of morals.	I know how water gets to and from the drinking fountain.	I know where my water comes from at home.	I know what to do to help our water systems.	I am a Mississippi River water steward.
PRE	5.50	4.63	4.19	4.73	3.00	4.10	3.82	3.59
POST	6.00	4.84	5.38	5.24	6.33	5.72	4.80	5.42

Interpretation: For each question, the average agreement went up, indicating an increase in value placed on water and the Mississippi River, increase in perceived knowledge of water systems, and conservation attitudes. Interestingly, the Mississippi River was mostly perceived by camper’s to be an important part of their lives at the beginning of camp. There was an increase in average identification as a Mississippi River Water Steward from slightly less than neutral, to more than somewhat agree.

The increased perception of knowledge about how water gets to the drinking fountain is supported by the upstream and downstream awareness parts of the survey, and was an emphasis of the camp. The perceived increase of where water comes from at home, may or may not reflect actual awareness, since the camp did not spend time studying the water systems for each campers home cities. Knowledge of what to do to help water systems, was supported by camp stewardship activities, and information, but camper knowledge of those activities was not tested for, specifically.

Recommendations: In future surveys, ask students, to describe ways to help protect water, to evaluate the uptake of that knowledge and skills. In addition, even though camp time may not allow for learning

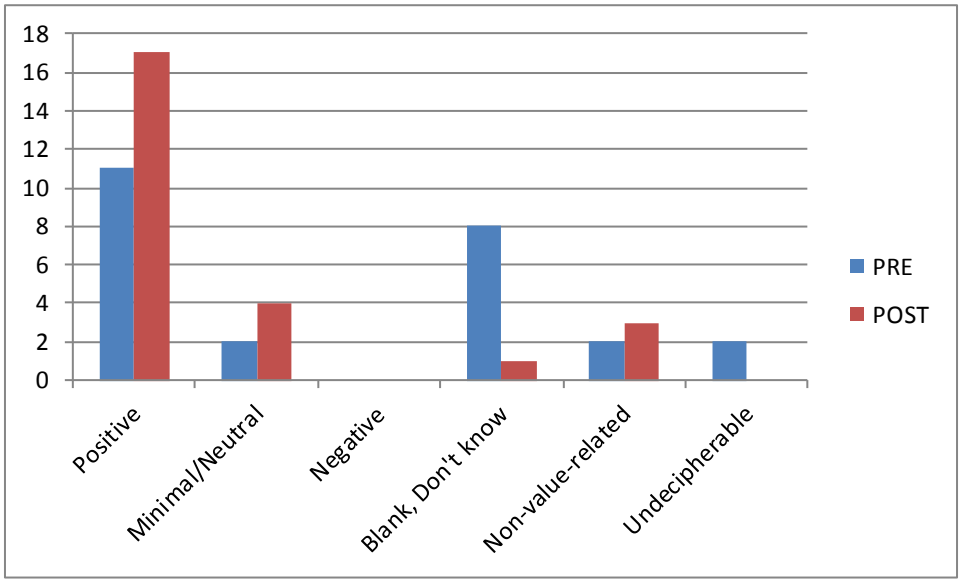
about campers home water systems, using a few examples of how it varies, would help ensure that campers know their own systems might be different.

More on River Value

In addition, a narrative question was asked about the value of the Mississippi River to the participant, pre and post camp. The responses were categorized as positive value, minimal or neutral value, negative value, and then answers not indicating value: Blank/Don't know, Non-value related answers, and undecipherable.

Figure 3. Mississippi River Value

What is the value of the Mississippi River to you?



Observations: Of the 25 pre and post responses, Positive value statements increased from 11 to 17. Also, more campers expressed themselves regarding river value, reducing the number of blank or "I don't know" responses by 7.

Conclusions on Drink Camp Participant Outcomes

From the comparison of pre and post surveys of campers in drink camp, it appears that awareness of water/river systems increased. It also appears that camper concern about water and river health increased as well as their stewardship identity. Campers also showed an increase in their perception of their own skills to help protect water. This was reinforced by applying skills of planting native plants, communicating the value of water in their photographs and art maps, and using the exhibit and online GIS story map as tools to practice their communication skills as they gave their parents and siblings a guided tour of what they saw and learned. Thus Grant goals for increasing Mississippi River and water awareness, skills and concern, were met.

Rain Camps Pre and Post Survey Results

Participants in the Rain Camp were asked to take a pre-survey at the beginning of camp, and a post survey at the end of camp. The questions were about **their awareness of storm water systems, the value they place on the Mississippi River, and their identification with water conservation and protection statements.** The results from the pre/post surveys of rain camp participants are described below.

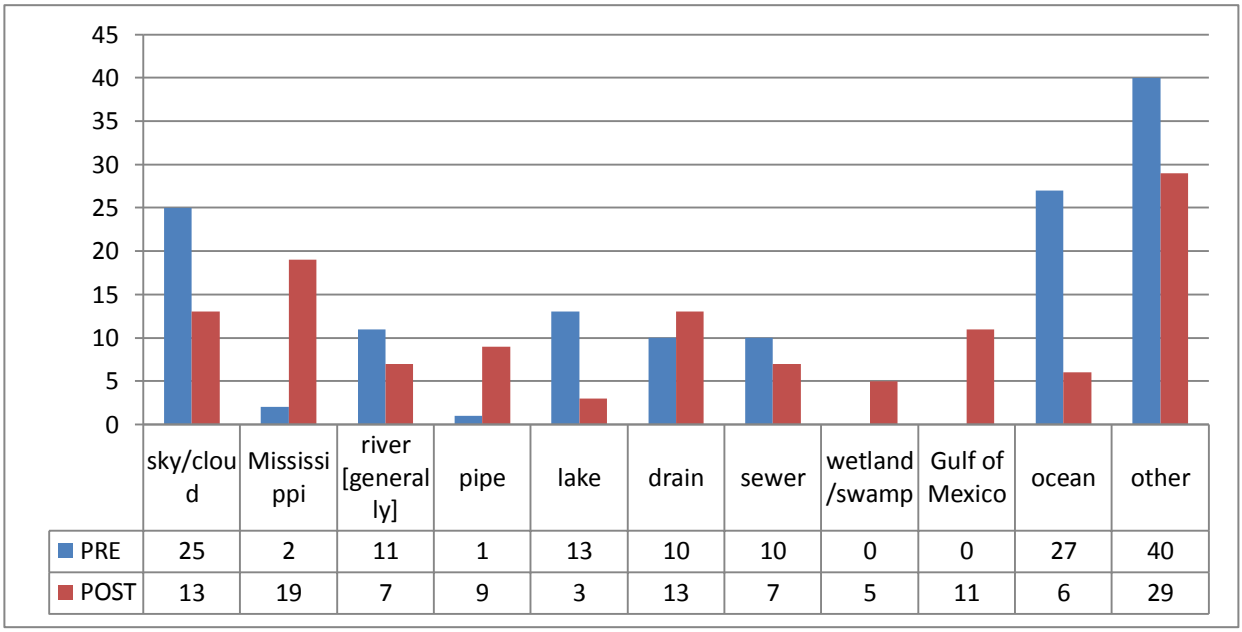
This is a picture of the Storm Drain outside of this building. When it rains, water runs into this drain.

Awareness of water cycle

The stormwater drain just outside the camp location was the local reference point for the rain water journey. In the pre and post tests, participants were shown a picture of this storm drain and asked several questions related to the water cycle upstream and downstream from this storm drain. The goal is to use multiple questions to draw out a more complete story of water from the campers. The responses to the first 5 questions are combined to determine the number of times different elements of the water cycle were mentioned compared to the major elements that were included in the camps.

Figure 4. Water System Awareness

Number of mentions of elements of water system in response to questions:
Where does the water come from?
Where does the water go?
What happens next?
What happens to the water along the way?
Where does the water end up?



	sky/cloud	Mississippi	river [generally]	pipe	lake	drain	sewer	wetland /swamp	Gulf of Mexico	ocean	other
PRE	25	2	11	1	13	10	10	0	0	27	40
POST	13	19	7	9	3	13	7	5	11	6	29

River Awareness Observations: Pre-camp, there were 2 mentions of the Mississippi River, and 11 mentions of the "river" generally for a total of 13 river-related mentions. Post camp there were 19 mentions of the Mississippi River, and 7 mentions of the "river" more generally for a total of 26 river-related mentions. Post camp is substantially higher than pre camp river-related mentions. Note that these are lower than the total Drink camp mentions, probably because the Drink camp water story includes the river at both the upstream and downstream ends of the journey. Also, Drink camp had prominent use of a poem called "River to River" that reinforced the source and destination of the water. Rain camp, however primarily used a single line "Where does the rain go?" from a poem that was not emphasized throughout.
Comment: The journey poem for each camp (which is part of the camp's source model) is one of several important ways that the connection to the river is reinforced. Consider using a simpler rain week poem in the future that reinforces river relationships more strongly.

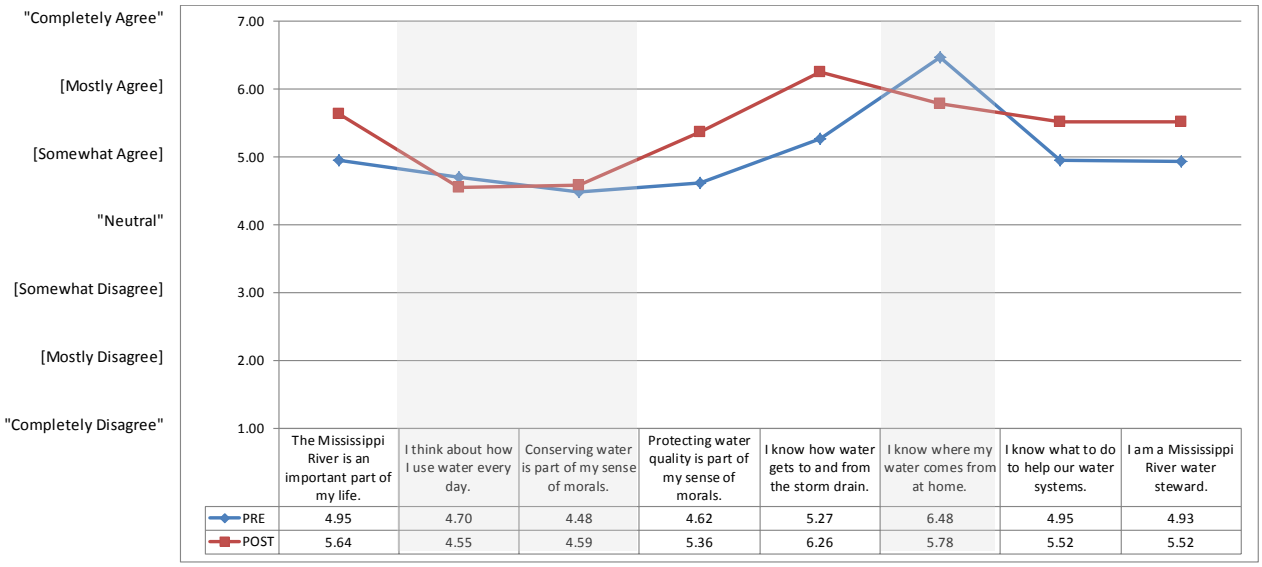
Water Infrastructure Awareness Observations: Due to logistics, campers did not start the rain journey from the roof and downspout. While these were mentioned, it is not surprising that rooves, gutters, and downspouts were not included in camper water stories, since they were not emphasized. Downstream, the sewer, pipes, and wetland were mentioned, with pipes and wetland mentions increasing, although sewer mentions decreased.

Comment: Work out logistics for future camps to more clearly show upstream aspects of stormwater before the drain. Do more review, and reinforcement with a rain journey poem in the future about downstream engineered and natural infrastructure aspects of stormwater.

River and water value, water knowledge confidence, and conservation attitudes

A number of questions were asked about water values, awareness, and conservation attitudes. To compare pre-tests and post-tests, the graph, below, plots the average degree of agreement for each, represented on a scale from 1-7 where 1 is "Completely Disagree" and 7 is "Completely Agree." Depending on the question, between 21-23 campers responded in the pre-test, and 22-23 in the post-test.

Figure 5. Average agreement with statements about water value, knowledge, and conservation attitudes



	The Mississippi River is an important part of my life.	I think about how I use water every day.	Conserving water is part of my sense of morals.	Protecting water quality is part of my sense of morals.	I know how water gets to and from the storm drain.	I know where my water comes from at home.	I know what to do to help our water systems.	I am a Mississippi River water steward.
PRE	4.95	4.70	4.48	4.62	5.27	6.48	4.95	4.93
POST	5.64	4.55	4.59	5.36	6.26	5.78	5.52	5.52

Interpretation: Gray shading is placed over the three questions that have more to do with domestic water use and were not the focus of the camp, though they were relevant for the other "Drink camp." In these questions agreement stayed nearly the same or went down. Since this is not a focus of this camp it is not a concern, and is shown for context with the Drink camp only. For the other unshaded, more relevant questions, agreement went up indicating an improvement in concern for stewardship and the Mississippi, as well as an increase in perceived knowledge about stormwater systems and how to help protect water.

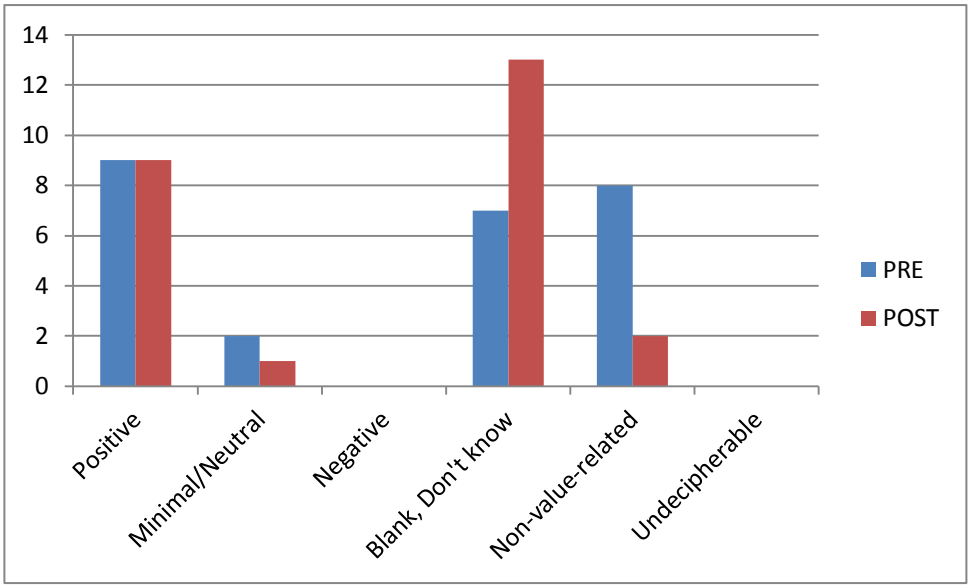
Recommendations: In future surveys, ask students, to describe ways to help protect water, to evaluate the uptake of that knowledge and skills. In addition, even though camp time may not allow for learning about campers home stormwater systems, using a few examples of how it varies, would help ensure that campers know their own stormwater systems might be different.

More on River Value

In addition, a narrative question was asked about the value of the Mississippi River to the participant, pre and post camp. The responses were categorized as positive value, minimal or neutral value, negative value, and then answers not indicating value: Blank/Don't know, Non-value related answers, and undecipherable.

Figure 6. Mississippi River Value

What is the value of the Mississippi River to you?



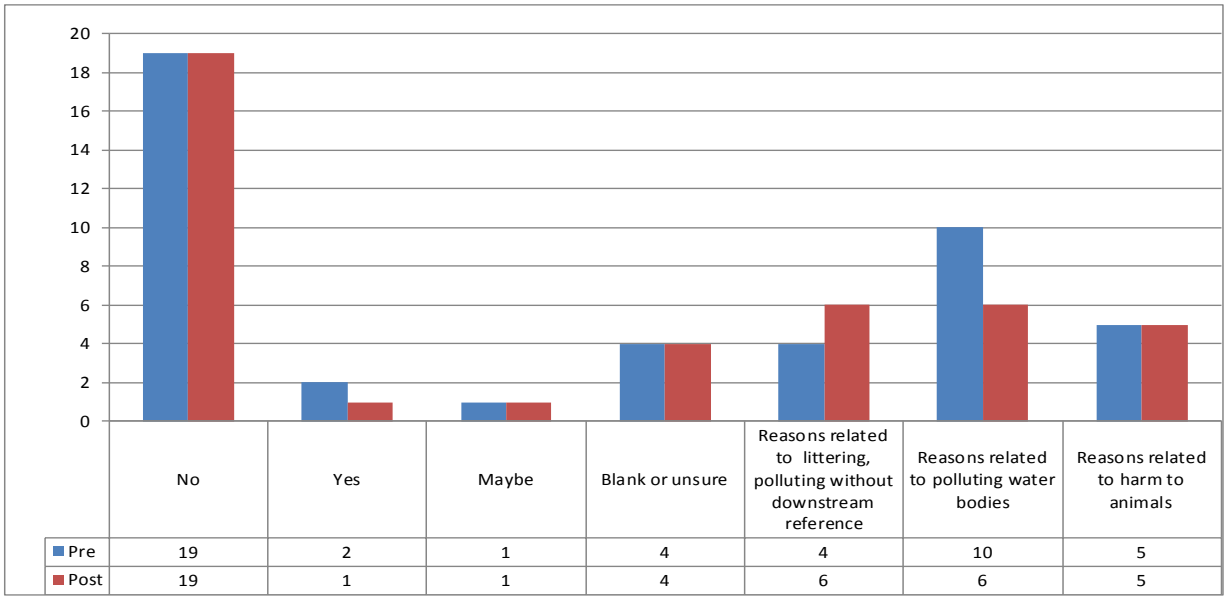
Observations and Comments: Positive value statements did not change and blank or unsure values went up. It is unclear why value of the river did not increase as it did in the drink camp results. The number of non-value statements went down. These were mostly either mentions of the function of the river, eg. "so fish can swim" or were a number. Since the question was on the top of the page with the 1-7 scale for agreement with statements, the campers may have been confused as to how to answer the question, and some put a number. Unless they provided the scale (eg. "from 1-10, 3") numbers were counted as non-value statements. Comment: for future camps, this open ended question could be revised to better assess how/if camper's value of the Mississippi River has increased.

More on Water Protection

A question was asked in regard to the picture of the storm drain about whether it was a good place to dispose of trash and yard waste and why. Here are the responses:

Figure 7 Perception of Pollution and Storm Drains

[In reference to picture of storm drain] "Is this a good place to put your garbage – like oil or pop cans or old leaves if you can't find a trash can? _____Why? "



	No	Yes	Maybe	Blank or unsure	Reasons related to littering, polluting without downstream reference	Reasons related to polluting water bodies	Reasons related to harm to animals
Pre	19	2	1	4	4	10	5
Post	19	1	1	4	6	6	5

Observations and Comments: There were already a majority (19 of 26 pretests) that knew one shouldn't put garbage or yard waste in the storm drain, and this number did not change (19 of 25 posttests). Reasons given were categorized by littering or pollution in general without downstream implications (eg. "because it is littering"), versus reasons that related to the downstream water getting polluted (eg. "because it will pollute the water." It is interesting, that mention of polluting downstream water bodies went down. While this evaluation is not thorough enough to draw final conclusions, one possible reason might be that the visit to the wetland emphasized its positive impact on helping to clean the water before it goes to the Mississippi River, thus, students may have thought downstream pollution was "taken care of." It is recommended in future years to make sure it is clear that even though the wetland helps clean the water, that it is still important to keep pollutants out of the storm drain, especially since many storm drains are not sent to filtering wetlands before they release water to lakes or rivers.

Conclusions on Rain Camp Participant Outcomes

From the comparison of pre and post surveys of campers in Rain camp, it appears that awareness of stormwater/river systems increased in some areas, although this wasn't shown strongly in other areas in terms of the water stories. However, campers' confidence in how water gets to and from the storm drain, which was already fairly high to start with did increase. Reinforcing the story of stormwater in future camps could improve these results. Other areas, such as camper concern about water and river health increased as well as their stewardship identity. Campers also showed an increase in their perception of their own skills to help protect water which was reinforced by applying skills of planting native plants, communicating the value of water in their photographs and art maps, and using the exhibit and online GIS story map as tools to practice their communication skills as they gave their parents and siblings a guided tour of what they saw and learned. Thus grant goals for increasing

Mississippi River and water awareness, skills and concern, were met with some room for improvement in reinforcing the sequence of the stormwater journey.

Staff and Partner Feedback on Participant Learning

Staff and partners for the project were asked via email:
1. What are your thoughts on the project effectiveness for student learning about water issues and why?

Here are responses representing a place-guide partners and camp/program staff. All of these responders are involved in education work in one way or another, one in public education about water issues.

"The students gained a far greater understanding of the water cycle and water than they did coming in. It was very clear to see how much they learned during the reception while they were explaining the journey to their parents." —co-instructor

"Judging from the level of interest of the students at River Park, I think the time there was worthwhile." —public water educator

"I think this was a great first year of camps, and with a little bit of tweaking, going forward it's going to be amazingly effective for student learning outcomes. Being able to have the experiential piece of trying to help lift a manhole cover, or going into the water treatment plant, or helping with wetland plantings is invaluable. Most kids learn best through tactile, hands on learning, and this is a great format and opportunity in which to do that." —camp program staff

Staff and Partner Feedback on Overall Camp Design

Staff and partner feedback was sought informally and through emailed questions. This feedback included staff and partner ideas for improved logistics and camp design, as well as feedback on how the camp worked for them, as participating members of the team. Some of this feedback does not address the three goals directly, but is important to ensure the improvement of the camp design over time, which ultimately does impact the three goal areas.

Highlights of feedback regarding camp design:

- Day one of Drink camp started off packed with field trips, and the camp itinerary could have benefited from more time at the beginning of camp to build relationships between campers and counsellors and teachers as well as set the stage for the field trips to come.
  This feedback was addressed in the second year, with an itinerary change that solved the problem and made camp run more smoothly.
- For both camps, there could have been more breathing room, the schedule of activities was packed tight. While the children and counsellors had positive reviews over all, this was an area mentioned for improvement.
  This feedback was taken into account in the following camp year, decreasing the number of

activities, and offering dual track activities, so campers could choose which art activities they most wanted to do.

- Water testing and science time was a well-liked portion of camp, and important to the well-rounded exposure to water issues, but was heaviest at the end of camp. It was suggested that water testing be integrated more throughout camp.
  This was taken into account and the second year, water testing was woven through the camp from the beginning, with water testing teams collecting water and performing one of the tests at each location.

Additionally other feedback resulted in improvements in the second year of camps regarding

- the exhibit design (more interpretive material)
- the logistics of downloading photos from each camp day from all the campers (a designated team member was scheduled for this time consuming task)
- the documentation of the camps were too much for teachers to keep up with in the first year (so dedicated team support was assigned to write daily blogs, including camper photos, and also to engage high school interns in the camp
- some walking tours were too long for the younger campers (added more bus support)

Partners: Partners offered ideas for increased engagement with the places they interpreted. All but one partner was interested or able to commit their in-kind time to participate the second year.

Goal 2 Evaluation: Formal and Informal Educator Outcomes

Educator Goal from Work Plan: *2) Water Journeys will serve as a demonstration to formal and informal educators for how integrating STEM skills, arts, storytelling and experiential learning develops in children an awareness of water and of how to live more sustainably by conserving and keeping water clean. The project will be shared to educators through targeted outreach and dissemination, including a website and short video that will be created.*

A number of artifacts and presentations were created that provide media and educational materials for informal and formal educators to learn about the camps.

Website (and linked GIS Story Maps, Video)

A website was created that includes:

- Home page with blog posts describing the activities of each camp day with pictures. This serves as a reference for interested educators, as well as a way to engage parents throughout the camps. The web page serves camps into the future too, and the most recent blog posts are about the most recent camps, after the grant period.
- About page: background on the camps, and the ENRTF funding

- A video that illustrates the content and concepts of the grants, showing excerpts of camps in progress, as well as staff interviews.
- Rain Story Map page that describes Rain camp and links to the GIS story map that uses student photos and words to tell the story of the students exploration of the stormwater flowing through the storm drain at their camp and its journey to the Mississippi River.
- Drink Story Map page that describes Drink Camp and links to the GIS story map that uses student photos and words to tell the story of the students exploration of the drinking water and sanitary sewer upstream and downstream of the drinking fountain at their camp and how they are connected upstream and downstream to the Mississippi River.
- Exhibit Page that provides information about the public art-science exhibit about the camps. See the Exhibit section for more information
- Acknowledgements Page, which lists the substantial collaborators, and also serves to show educators the types of partners they should consider if they implement this on their own.
- Learn & Act page that suggests ideas and links for educators and the public to learn about their own water systems and take action to protect water.
- Images page which is mostly for the campers and their families to download camper photos, but may be of interest to others who want to see the full set of camper photos and artwork, beyond what campers selected to include in their story maps.

Exhibit

The exhibit shows the story of youth exploring their water systems to discover how they are interconnected with the Mississippi River. The exhibit shares what the campers experienced and created through their photographs, nature notebooks, hand made maps, and the final GIS (Geographic Information System) story maps about their journeys.

The exhibit is also part of the camper learning environment, with some gatherings held by the large geodesign display. The exhibit backgrounds are set up before camps each year, and the campers fill the exhibit in with their photos and artwork and science testing during the camp weeks. The camp weeks culminate in exhibit receptions where parents come and their children guide them through the story of water they explored.

The exhibit location is the Commons Meeting and Art Space at Institute on the Environment at the University of Minnesota Located in R350 Learning & Environmental Sciences. The exhibit is typically held all summer, which gives extensive exposure to researchers and visitors to the building.

While educators may not have such as space at their disposal in their learning settings, the exhibit highlights the importance of students sharing their work with the public.

In addition, there are several educational centers in the building that also have a chance to be exposed to the exhibit including the STEM Education Center and the Learning Technologies program. A teacher's institute for Climate Generation that was held in the building also was exposed to the exhibit from the 2017 camps.

Presentations and Dissemination

The website and materials available have been or will be shared with hundreds of educators through conference presentations and networking sessions as well as web and social media outreach done by IonE. The conferences include:

- the Minnesota Association for Environmental Education (MAEE) meetings in 2016 and 2017
- the Minnesota Educator's Academy annually in October
- the Upper Midwest Association for Campus Sustainability (UMACS) in Pella, Iowa in late September, 2017
- Camps were presented on a national stage at the Association for Advancement of Sustainability in Higher Education (AASHE) annual conference in October, 2017.
- In the last week of June, 2017, immediately after the 2017 camps were completed, over 100 educators saw the Water Journey Camp exhibit, including nearly 60 attending the Climate Generation Summer Institute at IonE and 45 attending a national workshop on Sustainability and Diversity in Higher Education at IonE.

Goal 3 Evaluation: Public Education Outcomes

Public Education Goal from Work Plan: *3) Through the work of Institute on the Environment's communications team—who will make use of participants' artwork, stories and service projects—the public, and particularly the St. Paul campus and its immediate neighborhood will become a more water-aware, sustainable community through the Water Journeys programs taking place in indoor recreational spaces, outdoor classroom spaces, field trip locations and at the St. Paul campus Sarita wetland and pond, which is also a location for service learning.*

Public Education Materials, Activities, Impacts

The website and materials available (described in the prior section) have been and will continue to be shared with the public, beyond educators, through web and social media outreach done by IonE.

Highlights:

- With the camp location at IonE, IonE staff and faculty were made keenly aware of the power of an art, science and storytelling approach to learning about water. The energy of the campers and their learning about water systems inspired the staff and faculty as well as many visitors attending meetings and events at IonE.
- Water Journey Camps contributed to IonE staff and faculty expanding their engagement in water related and K-12 programming, including: 1) a new stewardship project starting in fall, 2017 at Sarita Conservation Area, 2) a partnership between IonE and the "Water Bar" where

flights of local tap waters are served to students and community partners, 3) placement of 5 high school interns from the City of St. Paul Right Track program at IonE in summer 2017, including 3 assisting with Water Journey Camps

- Summer 2016, water journey camps including the video were presented at the **Minnesota State Fair on a stage at the EcoExperience.**
- The camps were presented at the annual stormwater meeting for the University of Minnesota in 2016
- The camps concept and use of GIS were presented at the ESRI GIS User Conference in San Diego, CA in summer 2017

Staff and Partner Feedback on Public Education

Staff and partners for the project were asked via email:
2. What are your thoughts on the project effectiveness for public education about water issues and why?

Here are responses representing both place-guide partners and camp/program staff. All of these responders are involved in education work in one way or another, two in public education about water issues.

“Any time you give a child the ability to educate their parents on a particular issue, you create a huge impact in public education. Parents take their kid's interests, education and concerns very seriously. They will be more likely to think about it too as time goes on. “ —co- instructor

“Again, the level of interest of the students I met makes me think that the message didn’t end there. I imagine interesting conversations at home.” —public water educator

“The project looks very effective for public education because of how holistic and personable it is.” —public water educator

“The end of the week open house for the students and their parents got rave reviews from what I heard. For the kids to be able to go in and show their parents their journey through the story maps really opened a lot of their eyes. It has the trickle down effect that these kids are in this summer camp setting, with the opportunity to really do something unique to learn about water issues, are getting excited and bringing home that excitement and new found knowledge to share with their families; and parents talk, so now those parents are telling their adult friends and family members about this awesome opportunity their kids partook in. When it's real, and hands on, and memorable, that's when the true learning happens, and some of these kids will have a little ember lit within them as they move forward in their lives and educational careers. As you can tell, I'm a firm supporter and believer in the effectiveness of this project for the students and the public. And the video! Amazingly well done! I've already shared it with almost everyone I know!“ —camp program staff

Conclusion and Recommendations

Based on the evaluation of grant goals, student, parent, staff and partner feedback, as well as the wider reception by educators and the public, the Mississippi River Water Journey Camps were a success. The design of the grant as a model to be repeated in following years, offers the opportunity for improving the camps each year, as was already done in summer 2017. Each summer of camps, has its own outreach and dissemination activities through the camper families, partners, and Institute on the Environment communications resources, so that the outreach and dissemination that are built into the camp design continue and can engage more people in learning about this model and how to protect the Mississippi River and other water bodies.

Recommendations remaining after the logistics and design improvements already made in the camp's second year are refinements to improve areas such as: ability to measure progress in desired outcomes by fine tuning survey questions, further simplification and streamlining of camp activities for more focus on the most essential elements, and continued outreach and dissemination to educators and the public.