

2015 05d Project Abstract

For the Period Ending June 30, 2017

PROJECT TITLE: Students Engaging Local Watersheds Using Mobile Technologies

PROJECT MANAGER: Joan Freese

AFFILIATION: Twin Cities PBS (aka Twin Cities Public Television or TPT)

MAILING ADDRESS: 172 E Fourth Street

CITY/STATE/ZIP: St. Paul, MN 55101

PHONE: 651-229-1339

E-MAIL: jfreese@tpt.org

WEBSITE: tpt.org

FUNDING SOURCE: Environment and Natural Resources Trust Fund

LEGAL CITATION: M.L. 2015, Chp. 76, Sec. 2, Subd. 05d

APPROPRIATION AMOUNT: \$147,000

Overall Project Outcomes and Results

Splash Screen: Students Engaging Local Watersheds Using Mobile Technologies environmental education pilot was designed to foster stewardship of water resources in middle school youth living in urban Minnesota communities. Ran in partnership with urban 4H clubs in the Twin Cities and Duluth, the project combined Place Based Education (project based learning experienced outside the classroom alongside community experts) with Mobile Learning, or education that uses portable technology, to teach about watersheds.

Project goals were for participating youth to:

- understand the importance of water resources in their community ;
- be able to describe the major features of their local watershed;
- develop a basic understanding of some ways that humans can help and/or hurt this important resource;
- become acquainted with storm water runoff and what people can do to prevent it; and
- experience environmental advocacy first-hand by developing a public information campaign to share with their peers, family, and community, educating them about their watershed.

A total of 20 educators in Duluth and St. Paul were trained in: Splash Screen hands-on curriculum (Project Wet activities); place-based education, including working with community experts; and mobile technology. Bi-monthly webinars were held to provide updates and hear feedback from sites. Additionally, TPT and 4H held in-person meetings for educators prior to implementation for updates and technology distribution.

Two 4-H programs in Duluth and eleven in the Twin Cities implemented the Splash Screen curriculum during the spring and summer of 2016, reaching 107 youth participants with 25 hours of hands on learning per student.

Summative Evaluation of Splash Screen was conducted by the Science Museum of Minnesota's Evaluation and Research in Learning group and measured the overall impact of the project on the educators and youth compared to project outcomes. The evaluation was guided by four questions, three aligned with project outcomes for educators and one aligned with project outcomes for youth. Project evaluation results, which showed that overall the project was more successful at addressing educator outcomes than it was at addressing youth outcomes, will guide TPT and 4H as the project staff plans scale-up of the program for youth. (See *Splash Screen Summative Evaluation* for an overview of the project evaluation.)

Project Results Use and Dissemination

On Saturday, October 8, 2016, Twin Cities PBS hosted a Splash Screen event at the station for project participants to share their watershed media project with family, friends, and community members. Youth presented a total of 9 final projects from 5 project sites, sharing their media-rich projects and discussing the importance of urban watersheds health for Minnesota communities.

In addition, SciGirls staff presented at TIES 2016 Education Technology Conference on Monday, December 12, 2017, in downtown Minneapolis. The session, titled *Splash Screen: Engaging Local Watersheds Using Mobile Technologies*, was attended by approximately 50 teachers, technology integrationists, and other education professionals from the formal education sector. Here is a description of our offering:

Combine Place Based Education (project based learning experienced outside the classroom alongside community experts) with Mobile Learning to teach about watersheds. You will be given apps and other resources for environmental education, technology integration strategies and lessons learned from the pilot and evaluation done by the Science Museum of Museum. Splash Screen is a pilot project created by Twin Cities PBS in partnership with Urban 4H with funding provide by the Minnesota Environment and Natural Resources Trust Fund, that is designed to foster environmental stewardship of water resources in youth living in urban Minnesota communities.

While our project is now officially closed, TPT and Urban 4H are looking for funding opportunities to provide scale-up of the pilot program.



Environment and Natural Resources Trust Fund (ENRTF) M.L. 2015 Work Plan Final Report

Date of Report: March 1, 2017

Date of Next Status Update Report: Final Report

Date of Work Plan Approval: June 11, 2015

Project Completion Date: December 31, 2016

Does this submission include an amendment request? Yes (Retroactive)

PROJECT TITLE: Students Engaging Local Watersheds Using Mobile Technologies

Project Manager: Joan Freese

Organization: SciGirls, Twin Cities PBS

Mailing Address: 172 E Fourth Street

City/State/Zip Code: Saint Paul, MN 55101

Telephone Number: (651) 229-1339

Email Address: jfreese@tpt.org

Web Address: pbskids.org/scigirls

Location:

St. Louis, Hennepin, Ramsey, Washington and Dakota counties

Total ENRTF Project Budget:

ENRTF Appropriation: \$147,000

Amount Spent: \$133,465

Balance: \$13,535

Legal Citation: M.L. 2015, Chp. 76, Sec. 2, Subd. 05d

Appropriation Language:

\$147,000 the first year is from the trust fund to the commissioner of natural resources for an agreement with Twin Cities Public Television to deliver an experiential, project based educational program utilizing mobile technologies to empower at least 200 middle school students in 4-H programs to engage in understanding and protecting local water resources.

I. PROJECT TITLE: Students Engaging Local Watersheds Using Mobile Technologies

II. PROJECT STATEMENT:

Splash Screen: *SciGirls Exploring Watersheds Using Mobile Technologies* will foster environmental stewardship of water resources in youth living in urban Minnesota communities. *SciGirls* will partner with 4-H programs in Duluth and the Twin Cities to teach middle school youth about water resources in their communities. The program, which is a pilot, will combine Place Based Education (project based learning experienced outside the classroom alongside community experts) with Mobile Learning, or education that uses portable technology, to teach about watersheds.

The curriculum has already been designed and written, and it includes the use of iPads equipped with:

- Geospatial Technologies such as Google Earth and ArcGIS App;
- an Augmented Reality app called ARIS;
- a digital journaling site called Kidblog; and
- media creation tools including SoundCloud, iMovie, and Google Apps for the iPad.

The project also integrates hands-on lessons from *Project Wet*, a well-established water curriculum.

As part of the urban watershed study, participating youth will:

- understand the importance of water resources in their community via an existing curriculum;
- be able to describe the major features of their local watershed;
- develop a basic understanding of some ways that humans can help and/or hurt this important resource;
- become acquainted with storm water runoff and what people can do to prevent it; and
- experience environmental advocacy first-hand by developing a public information campaign, project plan, or augmented reality tour of the watershed to share with their peers, family, and community, educating them about the watershed.

The *SciGirls* staff at Twin Cities Public Television will host a two-day training in St. Paul and in Duluth for 4-H educators to prepare them to run the project, with ongoing support offered online. Ten 4-H sites will implement the program in the Twin Cities and Duluth metro areas between April and September 2016, reaching 200 middle school students, providing 25 hours of hands on learning per student, or 5,000 student hours. This pilot project will be evaluated by the Science Museum of Minnesota's Department of Evaluation & Research in Learning and will serve as a model for future scale up programs at 4-H and other organizations in communities across Minnesota.

SciGirls is an Emmy Award-winning PBS Kids television series, website and on-the-ground educational outreach initiative, which is produced for PBS by Twin Cities Public Television. *SciGirls* is made possible with funding from the National Science Foundation. The *SciGirls* mission is to

- inspire, enable and maximize learning and participation in Science, Technology, Engineering and Math, or STEM;
- encourage greater interest in STEM careers; and
- promote positive impressions of STEM, and STEM identity development.

III. OVERALL PROJECT STATUS UPDATES:

Amendment Request (11/18/2015)

- 1) We were budgeted for a 2-day professional development training in St. Paul. However, after beginning the project, including early partner meetings, we determined it would be better for the two communities to have their own trainings, so that the watershed experts can attend the professional development to become familiar with the project and begin making connections with the 4H educators, thus fulfilling the place-based expert roles in both Duluth and the Twin Cities. This change works out for us, budget wise, as we would just use the travel money to bring our staff and Janine Kohn, the state Project Wet coordinator to Duluth for the second training, instead of traveling Duluth participants to St. Paul for the training as planned.
- 2) We are planning to use a contractor to help us find existing and/or develop screen-capture tutorials that will help 4H Club Leaders and 4H youth participants learn how to use the technology integrated into the curriculum. This work was planned as TPT project staff work, but between LCCMR submission and funding, we've had additional projects come in and our staff is not fully available to accomplish this deliverable in a timely fashion. We would also have the contractor help with the tech training as part of the trainings in Minneapolis and Duluth. We will use TPT project staff money to pay for this contractor.

Approved by LCCMR 12-15-2015

Project Status as of January 1, 2016:

Splash Screen work is progressing nicely. The bulk of our work to date has focused on: planning the educator trainings; engaging a consultant (Heather Benedict) to create technology tutorials; working with Science Museum of Minnesota to plan evaluation; and recruiting 4H club participants in TC and Duluth. See activity updates below for details regarding this work.

Amendment Request (June 30, 2016)

- 1) TPT requests 40 additional contractor hours to provide ongoing tech support of projects in the field. This support includes: attending kick-off meetings for educators prior to their inaugural sessions, participating in biweekly check-in webinars, and answering educator tech questions that arise during project implementation. TPT will move project staff funds of \$1,805 to Professional Contracts to cover this cost.
- 2) TPT request 2 additional daytrips to Duluth to support education staff with meetings and tech support (i.e., wiping Apps from tablets and reloading them for another session.) TPT will move \$400 project staff money to pay for this travel.

Approved by LCCMR 8-26-2016

Project Status as of June 30, 2016:

In the first six months of 2016, Splash Screen trained 4H educators in Duluth and the Twin Cities, bought and readied the tablets (technology was purchased with non-LCCMR funds), began program implementation, and provided ongoing support for programs via webinars, emails, phone calls, and face-to-face meetings. The Science Museum of Minnesota research staff conducted formative evaluation and began summative work.

Retroactive Budget Amendment Request (March 1, 2017)

- 1) TPT retroactively requests re-allocation of funds for additional for Activity 2 Other - Data and Technology usage costs, which were higher in the field than anticipated. This expense can be re-allocated from Activity 2 Professional Service Contracts and Activity 1 Other Expenses where we underspent.

Retroactive Budget Amendment Request Approved March 9, 2017

Project Status as of December 31, 2016:

Thirteen 4-H programs utilized the Splash Screen curriculum during the spring and summer of 2016, including two in Duluth and 11 in the Twin Cities. Twin Cities programs were held at nine locations, including: Coon Rapids Dam, Heritage Park, Washington County, Packer Pad, the American Indian Magnet School, the Harriet Tubman Center, and three parks in the Minneapolis Parks and Recreation district (Martin Luther King Jr., Pearl, and Pershing). Both Duluth programs were held at Lincoln Park Middle School.

Nine of the programs were delivered over four intensive days that drew almost exclusively from the Splash Screen program and Project WET curricula (see Table 1). The other four programs were delivered over the course of several weeks and were augmented by additional content and experiences.

Table 1. Splash Screen program locations and style of delivery.

	4 Day Program	Multi-Week Program
Coon Rapids Dam	1	1
Heritage Park	1	1
Washington County	1	0
American Indian Magnet School	0	1
Harriet Tubman Center	1	0
Packer Pad	1	0
Martin Luther King Jr. Park	1	0
Pershing Park	1	0
Pearl Park	1	0
Lincoln Park Middle School	1	1
Total	9	4

According to attendance records, 107 youth participated in Splash Screen—lower numbers than anticipated. The change in number of youth engaged from original estimates was due to a number of factors: 1) 4H recommendations for youth/adult ratio was lower than TPT anticipated when doing program design; 2) the program was offered for free, mostly during the summer. Program partners, such as Minneapolis Parks and Rec suggested they experience more program drop out when offered for free than if a fee is involved; 3) early implementation suggested that sharing the technology was not as productive as planned so sites that implemented later in the program closed enrollment with a lower cap; and 4) Duluth found youth recruitment to be tricky because their city typically has no summer middle school programs, so parents are not in the habit of looking for camps for their kids in this age range to attend.

Please see the “ACTIVITY 3: Evaluation of Splash Screen” section below for detailed implementation assessment information.

Overall Project Outcomes and Results:

Splash Screen: Students Engaging Local Watersheds Using Mobile Technologies environmental education pilot was designed to foster stewardship of water resources in middle school youth living in urban Minnesota communities. Ran in partnership with urban 4H clubs in the Twin Cities and Duluth, the project combined Place Based Education (project based learning experienced outside the classroom alongside community experts) with Mobile Learning, or education that uses portable technology, to teach about watersheds.

Project goals were for participating youth to:

- understand the importance of water resources in their community via an existing curriculum;
- be able to describe the major features of their local watershed;
- develop a basic understanding of some ways that humans can help and/or hurt this important resource;
- become acquainted with storm water runoff and what people can do to prevent it; and
- experience environmental advocacy first-hand by developing a public information campaign to share with their peers, family, and community, educating them about their watershed.

A total of 20 educators in Duluth and St. Paul were trained in: Splash Screen hands-on curriculum (Project Wet activities); place-based education overview; mobile technology tutorials; watershed expert information; and an overview of the Science Museum of Minnesota's (Department of Evaluation and Research) evaluation plan. Bi-monthly webinars were held to provide updates and feedback from sites. Additionally, TPT and 4H held in-person meetings for educators who were about to implement for quick reviews/updates and technology distribution.

Two 4-H programs in Duluth and eleven in the Twin Cities implemented the Splash Screen curriculum during the spring and summer of 2016, reaching 107 youth participants with 25 hours of hands on learning per student. Duluth programs were held at Lincoln Park Middle School and Twin Cities programs were held at nine locations, including: Coon Rapids Dam, Heritage Park, Washington County, Packer Pad, the American Indian Magnet School, the Harriet Tubman Center, and three parks in the Minneapolis Parks and Recreation district (Martin Luther King Jr., Pearl, and Pershing).

Summative Evaluation of Splash Screen: Engaging Local Watersheds Using Mobile Technologies was conducted by the Science Museum of Minnesota's Evaluation and Research in Learning group measured the overall impact of the project on the educators and youth in relation to the project outcomes. The evaluation was guided by four questions, two aligned with project outcomes for educators and two aligned with project outcomes for youth. Project evaluation results, which showed that overall the project was more successful at addressing educator outcomes than it was at addressing youth outcomes, will guide TPT and 4H as the project staff plans scale-up of the program for youth in Urban Minnesota. (See *Splash Screen Summative Evaluation* for an overview of the project evaluation.)

IV. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1: Professional Development

Description: Activity 1 - Professional Development has three parts:

1. 4-H Site Selection
2. Professional Development workshop for 4-H club leaders/instructors
3. Technology Tutorial Creation, iPad Set Up, and Video Content Editing

Professional Development part 1. 4-H Site Selection

Our two partners for ***Splash Screen*** implementation are

1. University of Minnesota Extension Center for Youth Development in Duluth, and
2. Urban 4-H, University of Minnesota, in the Twin Cities metro area.

Both organizations have established youth development programs, whose missions are to “measurably improve learning through youth-centered educational and engagement programs.”

The 4-H staff will recruit ten 4-H clubs within Minnesota to participate in ***Splash Screen***. SciGirls staff will provide 4-H project leads Rebecca Meyer in Duluth and Amie Modl in the Twin Cities with a project description and outline of participating club requirements to help them recruit clubs within their organization. Sites can choose to implement the program over six weeks (meeting twice a week) or during a weeklong “camp” format, suitable for summer youth programs. Either option provides 25 hours of hands on learning per child..

Each 4-H club participating must agree to:

- send 2 adult leaders/instructors to the training in St. Paul;
- collaborate with watershed experts in their community;
- participate in ongoing communication with other leaders on the *SciGirls* educators’ website; and
- provide feedback as part of the evaluation process with the Science Museum of Minnesota’s Department of Evaluation & Research in Learning. (See Activity 3 below.)

SciGirls staff will help the selected site educators localize the ***Splash Screen*** curriculum for the watersheds where they live. For Duluth, the focus will be on:

- Lake Superior
- Great Lakes Basin
- St. Louis River Watershed.

For the Twin Cities, the focus will be on:

- Mississippi River
- Upper Mississippi Basin
- Mississippi Water Management Organization
- Minnehaha Creek Watershed Organization.

To assist with the ***Splash Screen*** curriculum preparation, TPT/SciGirls staff selected Heather Benedict as the consultant both for her qualifications and because she was available and willing to work for \$45/hour, a more competitive rate than other candidates. Joan spoke with three qualified consultants, one of whom charges \$100-\$125/hour for similar work - too expensive, and another at a similar rate scale who wasn’t available on our timeline. While TPT purchasing policy doesn’t require a full RFP for a contract under \$10,000, we typically seek multiple bids or estimates for such work, as we did in this case.

(See the curriculum scope and sequence in Activity 2 below.)

Professional Development part 2. Training for 4-H club leaders

Professional development for 20 4-H club leaders/instructors (2 educators per 4-H site from 10 sites) will be delivered face-to-face in a two-day training at *SciGirl*/Twin Cities Public Television offices in St. Paul, and a second training in Duluth for the Duluth-based educators. This training will take place in early 2016 and project implementation will follow in Spring or Summer 2016. Having more than one educator from each 4-H partner organization attend trainings ensures the fidelity of program because educators will have a knowledgeable support system within their own organization. In addition, given the large size of 4-H clubs/groups (20 youth), two leaders will be required for outdoor lessons held near water and to troubleshoot the tech integration.

The training syllabus will focus on ***Splash Screen*** content that 4-H leaders will need to successfully run the program including:

- Place-based education overview including how to work with community based experts in watershed districts;

- *SciGirls Seven Strategies* - research based best practices for encouraging youth to pursue STEM subjects
- Technology overview and tips for using mobile devices in the field (to be enhanced with online tutorials);
- *Project Wet* hands-on activities;
- Science inquiry overview (to be completed online); and
- Evaluation plans and general project administration requirements.

SciGirls staff will provide ongoing support for the 20 4-H leaders on the scigirlsconnect.org website. This online community offers resources to educators who are implementing *SciGirls* programs in their communities. **Splash Screen** project on-line resources for educators will include:

- a collection of screen-capture video tutorials that provide how-to information for each featured technology tool. These video tutorials can be used by educators and shared directly with students on a “just-in-time” basis (when a learner needs to know more to proceed); and
- a series of videos, from *SciGirls* library, that model the inquiry process and will support and enhance both educators’ and students’ experiences.
- Science inquiry overview

SciGirls will also host a series of monthly webinars for the 20 4-H leaders, during which project participants will discuss implementation successes and setbacks, share tips, and provide feedback for continued refinement of the pilot program.

Professional Development part 3. Technology Tutorial Creation, iPad Set Up, Video Content Editing

Because the **Splash Screen** curriculum (outlined below in Activity 2) includes extensive integration of mobile technology, *SciGirls* staff will develop screen capture video tutorials for each featured technology to help 4-H leaders learn to use the software.

The videos will be developed so they can be shared directly with youth, to help them learn new software during the implementation phase of the project. (See Activity 2 for details.)

Videos will be created for the following technologies:

- **Google Earth and ArcGIS App**—Known as geospatial technologies, these applications include graphic information system (GIS), global positioning system (GPS), and virtual globe features.
- **ARIS Augmented Reality Platform**—ARIS is a user-friendly, open-source platform for creating and playing mobile games, tours and interactive stories. Using GPS and QR Codes, ARIS players experience a hybrid world of virtual interactive characters, items, and media placed in physical space.
- **Kidblog**—This safe and simple blogging software, which was designed for educational environments, lets learners practice digital journaling in nature. Science journals are a major focus of science education initiatives as they prompt observation and reflection for youth.
- **SoundCloud, iMovie, and Google Apps for the iPad**—Digital creativity tools will foster “4 C skills” (communication, collaboration, critical thinking, and creativity—aka “Twenty-first Century skills”). They allow youth the opportunity to synthesize what they learn as part of this project and use digital technologies (video, audio, websites) to communicate their learning to their communities and other **Splash Screen** project sites. Youth will have some determination in the technologies they employ.

In addition to creating technology tutorials, *SciGirls* staff will purchase iPads for the project and deploy the software on these devices. (Note: the iPads will be purchased with non-LCCMR funds.) We will also research and create a student user policy for youth participating in the **Splash Screen** program.

SciGirls staff will also gather and edit existing video content from the *SciGirls* library of 28 half-hour shows to create an online resource for educators on the basics of inquiry-based science education. These videos will be shared on the project portal, which will be located at our *SciGirls*' educator website: www.scigirlsconnect.org.

Summary Budget Information for Activity 1:

ENRTF Budget: \$ 81,000
Amount Spent: \$ 78,437
Balance: \$ 2,563

Outcome	Completion Date
1. Create 7 screen capture video tutorials for Apps/software used in Splash Screen .	January 15, 2016
2. Download necessary software onto mobile devices.	January 15, 2016
3. Research and create an iPad user policy for student participants/parents to sign.	March 31, 2016
4. Select and edit a series of existing <i>SciGirls</i> videos on the scientific inquiry process.	January 15, 2016
5. <i>SciGirls</i> develops marketing materials for 4-H project leads for recruiting sites/clubs.	November 30, 2016
6. <i>SciGirls</i> develop contracts for Duluth and Twin Cities 4-H commitment.	November 30, 2016
7. 4-H leads in Duluth and Twin Cities recruit a total of 10 clubs (20 leaders) to participate.	January 15, 2016
8. Once the clubs are selected, <i>SciGirls</i> staff will identify community based watershed expert resources for the 10 sites.	February 1, 2016
9. Two 2-day trainings, one for Twin Cities area and one for Duluth area, for a total of 20 4-H educators in the <i>Splash Screen</i> curriculum completed.	March 31, 2016
10. Educators completed online training.	May 15, 2016
11. Evaluation for the 2-day training is completed and provided to evaluators (pre-post program survey for educators).	April 30, 2016
12. Monthly webinars are held for all participating educators to discuss challenges, successes and program implementation.	August 31, 2016

Activity Status as of January 1, 2016:

1. Hired Heather Benedict to find existing video tutorials or create original screen-capture videos for the Apps/software being used as part of the *Splash Screen* curriculum.
2. TPT fundraising staff secured private grant for purchase of mobile devices. We made decisions regarding make/brand of tablets and will purchase in the New Year and equip with software.
3. Heather Benedict is researching user policies for youth who will be participating in project using TPT equipment.
4. Sarah Carter is selecting existing videos that model the inquiry process to include in training.
5. TPT developed recruitment materials, which 4H staff distributed in their networks to find club partners.
6. 4H in the process of recruiting—it's looking like it will be 3 clubs in Duluth and 7 in the Twin Cities. Clubs will implement in a variety of ways (over six weeks and week-long summer camps, for example).
7. We decided to hold 2 trainings—one in Twin Cities (February 19-20) and another in Duluth (March 11-12).
8. We held a kick-off meeting for partners – 4H, Science Museum of Minnesota, and DNR.
9. We held follow up meetings with 4H and DNR (Project Wet Coordinator).
10. We created a draft agenda for the educator trainings.

Activity Status as of June 30, 2016:

Splash Screen educator trainings were held in Duluth on March 11-12 and St Paul on March 18-19 at the Great Lakes Aquarium and Twin Cities PBS offices respectively. The Duluth training totaled 4 educators along with support from the local 4H office and watershed expert participation from the Great Lakes Aquarium and St. Louis River Estuary laboratory education staff. The St. Paul training was attended by 16 educators, with support from Urban 4H staff and expert participation from the Minnehaha Creek Watershed District's Master Water Steward program. Janine Kohn, MN Project Wet Coordinator, attended both sessions. The training agenda included: Splash Screen hands-on curriculum (Project Wet activities), place based education overview, mobile technology tutorials, watershed expert information, and an overview of the SMM's evaluation plan.

Bi-monthly webinars were held to provide updates and feedback from sites. In addition, TPT and 4H held in person meetings for educators who were about to implement. These sessions were used for quick reviews/updates and technology distribution.

Activity Status as of December 31, 2016:

After the initial face-to-face trainings, TPT held bi-monthly webinars with educators to provide updates and feedback from sites. In addition, TPT and 4H held in person meetings for educators who were about to implement. These sessions were used for quick reviews/updates and technology distribution.

Final Report Summary:

TPT has great depth of experience in professional development work – especially for informal educators. This was our first experience integrating substantial technology into the training and we learned from our experience. We will make tweaks to future iterations of the project, but in general our training was successful and valued by the educators who participated.

ACTIVITY 2: Program Implementation at 10 sites in Duluth and the Twin Cities

Description: Sites will implement the *Splash Screen* curriculum between April 1 and August 31, 2016. Support for 4-H site leaders will occur online at scigirlsconnect.org and during monthly webinars.

SciGirls staff will help each site connect with community resources, such as watershed and rain garden experts, as well as other relevant environmental organizations.

<i>Splash Screen</i> Curriculum Outline		
Session	Lesson	Technology
Day 1 Map Your Watershed	Experiment with a model to see how water runs down hills. Use Google Maps to create personalized maps of their watershed.	<ul style="list-style-type: none">• Google Maps• Kidblog
Day 2 A Day in the Field	Bike (or bus) from club site to a major water feature in their watershed.	<ul style="list-style-type: none">• iPads for image, video, and audio collection• Kidblog
Day 3 Meet Local Watershed District Expert	Use Project Wet activities to identify parts of a watershed and determine its boundaries. Meet with educator from local watershed district to learn more about the watershed they live in and problems associated with human use.	<ul style="list-style-type: none">• ARIS App (to take an augmented reality tour of the watershed they live in)• iPads for video creation• Kidblog
Day 4 Just Passing Through	Participate in hands-on inquiry activities (also from Project Wet) to experience how water travels on land.	<ul style="list-style-type: none">• iPads for image collection and note taking• Kidblog

Day 5 Preventing Run off Solutions	Meet with community members to learn about practical solutions (rain gardens, pervious pavement, green rooftops) for preventing runoff.	<ul style="list-style-type: none"> • Google Maps • Kidblog
Day 6 Site Runoff Surveys	Work in small groups to survey sites in their neighborhood, determining the percentage of each site that contributes to storm water runoff and the percentage that encourages water infiltration.	<ul style="list-style-type: none"> • ArcGIS app • Kidblog
Day 7 Site Survey Debrief	Students share and discuss data from site surveys.	<ul style="list-style-type: none"> • Google Maps • Kidblog
Day 8 Project Selection and Planning	Work together in groups to determine a creative project that will educate others about watersheds, advocate on behalf of the environment, or improve the local environment (could be plans only and would not need to be completed).	<ul style="list-style-type: none"> • Google Docs • Kidblog • New Media Creation tools
Days 9, 10, & 11 Project Development	Work on advocacy/education/service projects/project plans.	<ul style="list-style-type: none"> • Google Docs • Kidblog • New Media Creation tools

Upon completion of the project, each 4-H student participant and 4-H club leader will participate in evaluation (as described below in Activity 3).

A poster session event will be held in the Twin Cities and Duluth for clubs to share their projects with other 4-H clubs, family, and the broader community. Potentially, these events could be held on the same day and connected via technology so that all participants can see each other's work.

Summary Budget Information for Activity 2:

ENRTF Budget: \$ 40,250
Amount Spent: \$ 32,658
Balance: \$ 7,592

Outcome	Completion Date
1. Each 4-H site completes the 6 week program.	August 31, 2016
2. All girls complete a pre-post program survey for the evaluators.	August 31, 2016
3. Poster session events held for clubs to share their work.	August 31, 2016
4. Each 4-H site reports participation through final program evaluation.	September 30, 2016

Activity Status as of January 1, 2016:

No program implementation activity to report at this time.

Activity Status as of June 30, 2016:

As of June 30, two sessions have implemented in Duluth, both at Lincoln Middle School, and seven sites in the Twin Cities at Heritage Park 4H, Coon Rapids Dam Regional Park, Pearl Park through Minneapolis Parks and Rec, Washington County 4H, American Indian Magnet School, West St. Paul Packer Pad, and Martin Luther King Jr. Park through Minneapolis Park and Rec. (The last three listed are still in implementation.) A total of 94 youth have participated in Splash Screen to date. Educators have mentioned that the youth especially enjoy spending time outside and working with technology.

Activity Status as of December 31, 2016:

Students Engaging Local Watersheds Using Mobile Technologies

As outlined above in the general project status, thirteen 4-H programs utilized the Splash Screen curriculum during the spring and summer of 2016, including two in Duluth and 11 in the Twin Cities. Twin Cities programs were held at nine locations, including: Coon Rapids Dam, Heritage Park, Washington County, Packer Pad, the American Indian Magnet School, the Harriet Tubman Center, and three parks in the Minneapolis Parks and Recreation district (Martin Luther King Jr., Pearl, and Pershing). Both Duluth programs were held at Lincoln Park Middle School.

Nine of the programs were delivered over four intensive days that drew almost exclusively from the Splash Screen program and Project WET curricula (see Table 1). The other four programs were delivered over the course of several weeks and were augmented by additional content and experiences.

Final Report Summary:

Eighteen educators and 107 youth were directly impacted at 13 program sites. Educators had approximately 25 contact hours with Splash Screen staff through training and spent an additional 16 hours of planning and prep time for each program. The 107 youth had between 25 and 32 contact hours (depending on site implementation). Programs were delivered in either four-day intensive or multi-week sessions. Nine of the programs were delivered over four intensive days that drew almost exclusively from the Splash Screen program and Project WET curricula. The other four programs were delivered over the course of several weeks and were augmented by additional content and experiences.

Educators adapted how they implemented the order of the Splash Screen lessons. While all of the programs began by implementing Lessons 1 and 2 and concluded with the final presentation share-out in Lesson 13, there was a lot of variability in the order of delivery for the rest of the lessons in the program guide. During webinars, educators shared that this flexibility of program design helped them to implement Splash Screen in the context of the ever-changing weather, the availability of local experts, and their access to other programming resources.

There was variation in daily youth attendance and overall attendance based on the program type. Daily attendance was higher for four-day programs than multiweek programs. Overall attendance was also higher for four day programs (70% of youth attended all four days) compared to multiweek programming (22% of youth attended all days of multiweek programming).

A total of 18 content experts (water resources specialists, watershed management organization representatives, aquatic invasive specialists, etc.) were directly engaged in the program, presenting and interacting with youth as expert guests (2-5 hours each).

And approximately 125 family members (parents, grandparents, and siblings) were indirectly impacted by attending end of program presentations by youth and the final project celebration at Twin Cities PBS. In addition, 150 people were introduced to the Splash Screen program at the Minnesota State Fair by participating in activities at a booth during STEM Day at the Fair.

ACTIVITY 3: Evaluation of Splash Screen

Description: Science Museum of Minnesota's Evaluation and Research in Learning group will focus on measuring the overall impact of the project on the educators and youth in relation to the project outcomes.

Evaluators will work with *SciGirls* and 4-H staff during each phase of development, implementation, and refinement of the ***Splash Screen*** project. The evaluation will monitor and document the project in relation to the project's outputs and outcomes with the ultimate aim of capturing knowledge to inform what is needed for others to implement the ***Splash Screen*** materials.

The evaluation will be guided by a number of overarching questions, which are aligned with project outcomes for educators and youth. The questions and data collection methods used to answer each question are outlined below.

Evaluation Questions	Data Collection Methods
1. How prepared are educators and what support do they need to implement the Splash Screen curriculum, integrate technology into the curriculum, and use the <i>SciGirls Seven</i> strategies? To what extent do educators integrate both technology and the <i>SciGirls Seven</i> strategies into their use of the curriculum?	<ul style="list-style-type: none"> • Observe two-day training • Post-training debrief with <i>SciGirls</i> staff • Pre-interview with Site Teams • Mid check-in online survey
2. To what extent does the project increase educator awareness and knowledge of issues around watershed health and environmental stewardship?	<ul style="list-style-type: none"> • Pre/Post interviews with site teams • Mid check-in online survey
3. To what extent does the project increase educator knowledge and skills around the integration of technology into environmental education?	<ul style="list-style-type: none"> • Pre/Post interviews with site teams • Mid check-in online survey
4. To what extent do youth increase their awareness and knowledge about watersheds, issues and decisions that affect watershed health, and actions they can take to be stewards of watersheds in their community?	<ul style="list-style-type: none"> • Pre/post youth survey • Youth digital journals

The formative evaluation will focus on improvement of the educator training and support components of the project, which can in turn impact the educator and student outcomes. An evaluator will attend the two-day professional development training for 4-H leaders and, at the end of each day, debrief with *SciGirls* staff to identify immediate, actionable improvements to the project.

Between their training and on-site implementation of the project, evaluators will interview each pair of educators. This interview will assess how prepared educators feel to implement the curriculum and identify key areas for educator support. The pre-interview will also have retrospective questions to serve as a baseline for gauging increases in educator awareness, knowledge and skills as a result of the project.

Evaluators will check in with each of the teams halfway through project implementation to identify additional supports and measure each site’s progress towards meeting program outcomes. Throughout the project, the evaluators will meet with *SciGirls* staff to share formative evaluation findings and offer recommendations for improvements, where appropriate.

Summative evaluation will focus on measuring the overall impact of the project on the educators and youth in relation to the project outcomes. To measure achievement of educator outcomes, post-interviews will be conducted with site teams, which will be compared to the pre-interview and mid-survey data.

Youth outcomes will be measured through pre- and post-surveys, and findings will be triangulated through reviewing a sample of youth journal entries and related youth projects.

To develop the youth pre/post surveys, we will draw from scales the Science Museum of Minnesota helped to develop as part of the NSF-funded *Developing, Validating, and Implementing Situated Evaluation Instruments* project, specifically the Self-Efficacy for Environmental Action and Behavioral Intention scales because they measure aspects of environmental stewardship. These scales are in the final development stages and will be completely validated in advance of the **Splash Screen** project.

Pre/post surveys will also include questions specific to watershed awareness, knowledge, and stewardship.

An Internal Review Board through the Science Museum of Minnesota will ensure the privacy and confidentiality of all participants through proper oversight of this study.

Students Engaging Local Watersheds Using Mobile Technologies

Summary Budget Information for Activity 3:

ENRTF Budget: \$ 25,750
Amount Spent: \$ 22,370
Balance: \$ 3,380

Outcome	Completion Date
1. SciGirls provides Science Museum of Minnesota research staff with project materials	January 1, 2016
2. Plan formative evaluation with Science Museum of Minnesota staff.	February 15, 2016
3. Science Museum of Minnesota executes formative evaluation.	March 31, 2016
4. SciGirls project staff review formative results and look for additional training needs and ways to improve support.	April 31, 2016
5. SciGirls plans summative evaluation with Science Museum of Minnesota staff.	July 31, 2016
6. Science Museum of Minnesota executes summative evaluation.	October 31, 2016
7. SciGirls review summative results, shares results with 4-H partners and integrates ideas into dissemination work and future implementations of Splash Screen .	December 31, 2016

Activity Status as of January 1, 2016:

1. We held a series of meetings with SMM staff to plan the evaluation work.
2. We are finishing work on sample project materials for handoff to SMM in January. (This will aid their continued design of the evaluation.)

Activity Status as of June 30, 2016:

Since January the evaluation team has completed the formative evaluation of the Splash Screen project and has embarked on summative evaluation collection. During the formative phase, evaluators observed the two-day trainings and webinars, collected surveys from educators before and after the trainings, and asked educators to answer more in-depth questions via an online written reflection. Observations and findings were shared through meetings, conversations, and a written report with the project team, and provided the group with actionable ideas at different stages of project development, as well as measures of how the training may have impacted educators' awareness and knowledge of watershed health issues and stewardship, as well as using scientific inquiry, place-based education methods and new technology in 4-H programs. Some of this data will also be used in the summative, to think about how educators' familiarity and knowledge around these topics changed throughout their experience with the program. Pre and post program surveys are also being collected from youth to better understand the impact of Splash Screen programs; these surveys will be administered with each group of participants until the programming ends in August.

Activity Status as of December 31, 2016:

Between June 30 and December 31, 2016, the SMM evaluation staff completed the planned evaluation with Splash Screen educators and student participants. See below for an overview of the Summative Evaluation. See the full evaluation, which is being submitted as a separate document.

Final Report Summary:

Summative evaluation of the Splash Screen program was guided by four overarching evaluation questions that are aligned with project outcomes for educators and youth.

1. To what extent does the project increase educator awareness and knowledge of issues around watershed health and environmental stewardship?

This evaluation question was answered by measuring educators' awareness and knowledge of what a watershed is, sources of watershed pollution, and best management practices. All three of these topic areas were related to

Splash Screen educator outcomes. The Splash Screen project successfully met these three outcomes for all seven educators.

2. To what extent do educators integrate inquiry place-based education strategies into their use of the Splash Screen program?

This question was answered by understanding educator knowledge and implementation of place-based strategies, including bringing in local experts. The question aligns with one of the project outcomes stating that educators would increase their understanding of place-based education and how to implement it within an environmental education setting. The program was slightly more successful in increasing educator knowledge of how to engage youth in environmental science in their own community, than how to engage local experts to facilitate learning experiences with youth. Almost all the educators successfully described strategies to integrate place-based education practices into their programming, including the use of watershed experts.

3. To what extent does the project increase educator knowledge and skills around the integration of technology into environmental education?

The third evaluation question was answered by asking educators about their knowledge of the benefits and drawbacks of using technology in environmental education, as well as the skills they gained around using technology with youth in environmental education. Educators were knowledgeable of a wide range of benefits and drawbacks to integrating technology into environmental education programming. The Splash Screen project was successful in increasing educators' skills around the use of technology in environmental education and facilitating technology experiences with youth.

4. To what extent do youth increase their awareness and knowledge about watersheds, issues and decision that affect watershed health, and actions they can take to be stewards of watersheds in their community?

The fourth evaluation question was answered by asking questions to measure Splash Screen's youth outcomes around knowledge of the definition a watershed, understanding of actions that hurt and help a watershed, and awareness of storm water runoff and what people can do to prevent it. There were some areas where the program was successful in increasing youth's awareness and knowledge, and other areas where the program wasn't as successful in doing so. The program was successful in increasing youth's understanding of a variety of actions that could help or harm a watershed. Two-thirds of youth were able to suggest best management practices to reduce runoff at local sites, but a third were unable to. The program was successful in increasing Twin Cities youth's understanding of their local watershed, but less so in increasing Duluth youth's knowledge of their local watershed. A majority of youth understood that storm drains lead straight to nearby waterways, but a quarter of youth still had misconceptions that storm drains lead to water treatment plants. The program was unsuccessful in helping youth obtain an accurate definition of a watershed at an early stage in the program, with less than a tenth of youth being able to describe a watershed after Lesson 2 of the curriculum.

V. DISSEMINATION:

Description: *SciGirls* will share project findings on informalscience.org, at conferences, such as:

- Minnesota Association for Environmental Education;
- Minnesota National Science Teachers Association; and
- The Minnesota' Naturalists Association.

SciGirls will also share project findings via established 4-H Youth Development channels and established *SciGirls* outreach partnerships. *SciGirls* staff will conduct a series of three webinars about the project for the *SciGirls* CONNECT network of formal and informal educators nationwide.

Status as of January 1, 2016:

No dissemination activity to report at this time.

Status as of June 30, 2016:

No dissemination activity to report at this time.

Status as of December 31, 2016:

SciGirls staff presented at TIES 2016 Education Technology Conference on Monday, December 12, 2017 in downtown Minneapolis. The session, entitled Splash Screen: Engaging Local Watersheds Using Mobile Technologies was attended by approximately 50 teachers, technology integrationists, and other education professionals from the formal education sector. Here is a description of our offering:

Combine Place Based Education (project based learning experienced outside the classroom alongside community experts) with Mobile Learning to teach about watersheds. You will be given apps and other resources for environmental education, technology integration strategies and lessons learned from the pilot and evaluation done by the Science Museum of Museum. Splash Screen is a pilot project created by Twin Cities PBS in partnership with Urban 4H with funding provide by the Minnesota Environment and Natural Resources Trust Fund, that is designed to foster environmental stewardship of water resources in youth living in urban Minnesota communities.

Final Report Summary:

While our project is now officially closed, TPT and Urban 4H will continue to present about the project at Minnesota conferences as appropriate.

VI. PROJECT BUDGET SUMMARY:**A. ENRTF Budget Overview:**

Budget Category	\$ Amount	Overview Explanation
Personnel:	\$60,495	1 Project Manager/Web & Print Producer 13.5% FTE for 1.5 Years; 1 STEM Content & Outreach Specialist 15% FTE for 1.5 Years; 1 Outreach Coordinator 6% FTE for 1.5 Years, 1 Director of STEM Education & Outreach 2% FTE for 1.5 Years; 1 Managing Producer 2% FTE for 1.5 Years, 1 Asst Editor/Media Manager 5% FTE for 1.5 Years
Professional/Technical/Service Contracts:	\$72,428	4H Partner Coordination \$10,000 (4-H staff coordination est 370 hours @ \$27/hour) ; Science Museum of Minnesota Evaluation \$18,000 (quote) ; 4H Club Leader fees \$40,000 10 sites, 2 Leaders per site = 20 people x est 100 hours @ \$18/hour + fringe = \$40,000) Curriculum Implementation & Technology Consultant \$4,000 (up to 89 129 hours at \$45/hour)
Equipment/Tools/Supplies:	\$2,950	Training event supplies - Curricula materials; Poster session event supplies; field kits
Travel Expenses in MN:	\$7,000	2 State educational conferences for presenting; Mileage; three evaluator trips to Duluth training and out-of-metro sites; TPT staff travel to out-

		of-metro training workshop
Other:	\$4,127	Content Experts for professional development; Data Plan for 4H Group Activities; 4H site blog storage fees; training facility rental in Duluth
TOTAL ENRTF BUDGET:		\$147,000

Explanation of Use of Classified Staff: N/A

Explanation of Capital Expenditures Greater Than \$5,000: N/A

Number of Full-time Equivalents (FTE) Directly Funded with this ENRTF Appropriation: 0.75 FTE

Number of Full-time Equivalents (FTE) Estimated to Be Funded through Contracts with this ENRTF Appropriation: 0.2 FTE

B. Other Funds:

Source of Funds	\$ Amount Proposed	\$ Amount Spent	Use of Other Funds
Non-state			
Corporate & foundation support	\$ 6,780	\$15,000	Tablets - 6 per mobile lab (rate includes also a hotspot) - 12 units at \$565 per unit
Twin Cities Public Television (In-Kind Support)	\$31,250	\$29,325	General and administrative support and overhead expenses not allowable expenses in ENRTF budget, calculated at 21.26%, Twin Cities Public Television's federally negotiated rate. (Note: includes \$950 of G&A in-kind on non-ENRTF expenses, the tablets paid for with Corporate support.)
Twin Cities Public Television (In-Kind Support)	\$30,000	N/A	Instructional video clips, 10 clips of 3 minutes each. (Note: instead of using Twin Cities Public Television owned video clips as planned, we used no-cost open source video.)
TOTAL OTHER FUNDS:	\$68,030	\$44,325	

VII. PROJECT STRATEGY:

A. Project Partners:

Project Partners Not Receiving Funds

- Misc. Watershed District education staff: connect with 4-H educators to provide "community expert" knowledge for Place Based nature of the project (individuals may receive \$100 honoraria)
- Minnesota Project Wet Coordinator: attend Professional Development training to represent Project Wet curriculum

Project Partners Receiving Funds

- Urban 4-H, University of Minnesota: \$5,000 to facilitate group sign up; \$20,000 for 5 clubs to run programs
- University of Minnesota Extension Center for Youth Development in Duluth: \$5,000 to facilitate group sign up; \$20,000 for 5 clubs to run programs

- Science Museum of Minnesota’s Department of Evaluation & Research in Learning \$18,000 for formative and Summative evaluations

B. Project Impact and Long-term Strategy:

Splash Screen integrates current goals within the field of environmental education in terms of reaching urban audiences and integrating technology. The opportunity to run the program with accomplished youth educators at the University of Minnesota’s 4-H sites and evaluate our efforts with Science Museum of Minnesota education researchers allows project staff to implement a new curriculum and best learn from the experience. In addition, because the program is replicable, it has potential for future scale-up across the state, through the 4-H networks working in collaboration with community-based watershed educators.

Water quality is a topic of universal interest as it is relevant statewide. Because of the ubiquity of this important resource in Minnesota, what we learn from this project will be of interest to other educators across the state, where many communities feature prominent water resources that impact community life.

C. Funding History:

Funding Source and Use of Funds	Funding Timeframe	\$ Amount
N/A		

VIII. FEE TITLE ACQUISITION/CONSERVATION EASEMENT/RESTORATION REQUIREMENTS:

A. Parcel List: N/A

B. Acquisition/Restoration Information: N/A

IX. VISUAL COMPONENT or MAP(S): See attached

X. RESEARCH ADDENDUM: N/A

XI. REPORTING REQUIREMENTS:

Periodic work plan status update reports will be submitted no later than February 1, 2016; July 31, 2016; and January 31, 2017. A final report and associated products will be submitted between April 1, 2017 and June 30, 2017.

Environment and Natural Resources Trust Fund
M.L. 2015 Project Budget



Project Title: Students Engaging Local Watersheds Using Mobile Technologies
Legal Citation: M.L. 2015, Chp. 76, Sec. 2, Subd. 05d
Project Manager: Joan Freese
Organization: Twin Cities Public Television
M.L. 2015 ENRTF Appropriation: \$ 147,000
Project Length and Completion Date: 1.5 Years, December 31, 2016
Date of Report/Amendment Request 3/1/2017

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Activity 1 Budget	Revised Activity 1 Budget 3/1/17	Amount Spent	Activity 1 Balance	Activity 2 Budget	Revised Activity 2 Budget 3/1/17	Amount Spent	Activity 2 Balance	Activity 3 Budget	Amount Spent	Activity 3 Balance	TOTAL BUDGET	TOTAL BALANCE
BUDGET ITEM					<i>Site Program Implementation</i>				<i>Evaluation</i>				
Personnel (Wages and Benefits)	\$50,595	\$50,595	\$49,350	\$1,245	\$5,750	\$5,750	\$4,461	\$1,289	\$4,150	\$3,919	\$231	\$60,495	\$2,765
Joan Freese, Project Manager/Web & Print Producer \$24,700 (74% salary, 26% benefits) 13.5% FTE for 1.5 Years													
Sarah Carter, STEM Content & Outreach Specialist \$19,000 (74% salary, 26% benefits) 15% FTE for 1.5 Years													
Niki Becker, Outreach Coordinator \$5,000 (74% salary, 26% benefits) 6% FTE for 1.5 Years													
Rita Karl, Director of STEM Education & Outreach \$4,000 (74% salary, 26% benefits) 2% FTE for 1.5 Years													
Emily Stevens, Managing Producer \$4,000 (74% salary, 26% benefits) 2% FTE for 1.5 Years													
Kyle Blakeborough, Asst Editor/Media Manager \$6,000 (74% salary, 26% benefits) 5% FTE for 1.5 Years													
Professional/Technical/Service Contracts	\$25,805	\$25,805	\$24,984	\$822	\$30,000	\$28,623	\$23,248	\$5,375	\$18,000	\$18,000	\$0	\$72,428	\$6,197
4H Partner Coordination Fee (U of M Twin Cities & Duluth) \$10,000													
Science Museum of Minnesota Evaluation \$18,000													
Curriculum Implementation & Technology Consultant \$5805 (up to 129 hours @ \$45/hr)													
4H Staff Leader fees for 10 sites @ \$4,000 each													
Equipment/Tools/Supplies	\$700	\$700	\$447	\$253	\$2,250	\$2,250	\$1,322	\$928				\$2,950	\$1,181
Training event supplies - Curricula materials \$700													
Poster session event supplies (2 events) \$1,000													
25 field kits, allow \$50 per educator & staffer \$1,250													
Travel expenses in Minnesota	\$3,400	\$3,400	\$3,157	\$243	\$0	\$0	\$0	\$0	\$3,600	\$451	\$3,149	\$7,000	\$3,392
2 State educational confs for presenting (includes conf fees) \$1,900													
Mileage @ federal mileage rate (100 miles/month) \$700													
Two evaluator trips to out-of-metro sites \$1,000													
TPT Staff day trips/mileage to assist Duluth educators \$400													
TPT Staff travel to Out of Metro training workshop \$1,200													
Other	\$750	\$500	\$500	\$0	\$2,000	\$3,627	\$3,627	\$0			\$0	\$4,127	\$0
Content Experts for professional development (5 x \$50 honoraria)													
Training facility rental for Duluth training \$500 11/18/2015													
Data & Technology Usage for 4H Group Activities \$1,500 \$3,627 12/31/16													
4H site blog storage fees \$500-incl in Data & Technology Usage													
COLUMN TOTAL	\$81,250	\$81,000	\$78,437	\$2,563	\$40,000	\$40,250	\$32,658	\$7,592	\$25,750	\$22,370	\$3,380	\$147,000	\$13,535