



## STEWARDSHIP FINAL REPORT

### PROJECT PROFILE

Your profile should be no more than three pages in length (preferably two). As it will be published to the GLFT website, please strive to communicate in language accessible to a general audience. The primary intended purposes of the profile are to (1) provide an overview of the work funded by GLFT and characterize results and achievements in an accessible manner, and (2) help interested parties access further resources or materials germane to the effort. The profile should follow this format:

#### *Synopsis*

- **Project Title:** River Revitalization Education Support (RRES)
- **Grantee Organization:** Groundswell Michigan - Grand Valley State University
- **Project Team:** Clayton Pelon, Joanna Allerhand, Claire Bode, Eileen Boekenstein, and Brenda Perry
- **Contact Person:** Clayton Pelon – GVSU College of Education, [pelonc@gvsu.edu](mailto:pelonc@gvsu.edu)
- **Grant Amount:** \$65,000
- **Time Frame:** 7/1/2017-6/30/2019
- **Focus Area:** Stewardship
- **Brief Project Summary** – The RRES grant created educational materials, subsidized K-12 stewardship projects and outdoor experiences for students, and hosted teacher professional development sessions that supported the Grand River Revitalization efforts. A partnership of the Grand Valley Metropolitan Council, Kent Innovation High School, WGVU Public Media, and the Grand Valley State University College of Education, the RRES grant partners developed multimedia curriculum materials hosted at [PBSLearningMedia.org](http://PBSLearningMedia.org) and [groundswellmi.org](http://groundswellmi.org). The professional development sessions are also available on [groundswellmi.org](http://groundswellmi.org) and YouTube so educators can continue to benefit from the products of the grant.

#### *Project in Context*

Groundswell, a hub of the Great Lakes Stewardship Initiative housed at the Grand Valley State University College of Education, lead the initiative with support from the Grand Valley

Metropolitan Council (GVMC), WGUV Public Media (WGUV), and Kent Innovation High School (KIH), to improve the educational component of Grand Rapids River. The GVMC has been an integral partner in the restoration efforts and currently works closely with Grand Rapids Whitewater staff and all entities involved with the project. WGUV has helped develop online resources to teach the public about the Lower Grand River Watershed, and has aired Public Service Announcements on protecting our watershed as part of joint grant work with Groundswell. Kent Innovation High School is a leader in project-based learning and has been an exemplar school in the Groundswell hub.

We used the infrastructure and expertise of Groundswell to provide: quality and sustained professional development support for teachers and schools, project funding for schools, and support for schools developing deep community partnerships. We developed scalable and replicable tools for teachers aligned with the Michigan Science Standards/Next Generation Science Standards that will continue to support teaching about the Grand River and the associated restoration effort. The RRES grant has created resources that will involve educators and schools in the effort to revitalize the Grand River and create a deeper connection to the river in the broader community.

### **Goals of the Effort**

1. Host four professional development (PD) sessions totaling 12 hours of instruction/discussion/activities about the restoration effort;
2. Develop three units for classroom teachers made available on PBSLearningMedia.org;
3. Develop three outdoor experiences that emphasize water quality knowledge;
4. Support two stewardship projects that focus on student engagement with the restoration effort.

### **Results**

In this section, briefly identify and summarize the key findings or results of the project (products developed, outreach engaged in, participation/use of materials achieved, feedback received).

Products developed, in line with the above goals:

1. Two, three-hour professional development sessions (Advanced Water Quality) for K-12 teachers on July 29th, 2018, during Summer Institute; and two, three-hour sessions (Social and Economic Impacts of the Whitewater project) on November 8, 2018, for a total of 12 hours of PD). Portions of both of these PDs were filmed and are available on Groundswell's YouTube channel:
  - a. July 29th, 2018 Advanced Water Quality:  
<https://www.youtube.com/watch?v=ETtrMdkjZNM&t=179s>
  - b. Social and Economic Impacts, video 1:  
[https://www.youtube.com/watch?v=eg\\_z5Vgn6dQ&list=PLV2DqaYFEsPzJsHTkMOSixHI\\_Z2Cm150n](https://www.youtube.com/watch?v=eg_z5Vgn6dQ&list=PLV2DqaYFEsPzJsHTkMOSixHI_Z2Cm150n)
  - c. Social and Economic Impacts, video 2:  
<https://www.youtube.com/watch?v=KHTBQuO3HvI&t=5s>
2. Three instructional units for classroom teachers made available on PBS learning media,

available at: <https://wgvu.pbslearningmedia.org/collection/river-re-wilding-evaluating-impacts-on-ecosystems-and-communities/>; also available at <https://www.gvsu.edu/groundswell/lesson-plans-54.htm>

3. Three outdoor experiences that emphasize water quality knowledge (two of the three experiences were filmed by WGVU, and the third outdoor experience was supplemented by a video covering the same material.) See list below for videos of all three experiences (hosted on YouTube), which supplement the three classroom units.
  - a. **Hester-Dendy challenge:** Students at Kent Innovation High made their own Hester-Dendy samplers through an engineering design challenge, then placed them in two bodies of water:  
<https://www.youtube.com/watch?v=vem63wu6NzQ&t=28s>
  - b. **Macro Sort:** KIH students removed the Hester-Dendy samplers, then counted and identified the captured macroinvertebrates to obtain a water quality score.  
<https://www.youtube.com/watch?v=9T8Ecnscd4Y>
  - c. **River Walk:** KIH students took a River Walk with their teacher, Brenda Perry, and with Eileen Boekestein, a GVMC educator. They learned about the history of the Grand River, the River's contributions to the Grand Rapids economy and sense of place, and the ways humans have altered it by walking its banks. A video covering the same topic is available here:  
[https://www.youtube.com/watch?v=l8rx9t\\_1pgg&t=10s](https://www.youtube.com/watch?v=l8rx9t_1pgg&t=10s)
  
4. Support of two stewardship projects focused on student engagement with the restoration effort: Both projects involved two schools, KIH (the alpha school) and the Grand Rapids Public Museum School (the beta school) learning about water quality and proposing ways to improve it.
  - a. In the first case study, at KIH, ninth-graders sampled macroinvertebrates and studied their connection to water quality, stood in the shoes of stakeholders who use the River, and completed independent research projects based on an identified community need. Students presented their research to each other at the end of the unit. One student team presented their research to environmental professionals at the 2018 Lower Grand River Organization of Watersheds (LGROW) Spring Forum. Summation video available: <https://youtu.be/lkYYKplb8-4>
  - b. In the second case study, sixth-graders at the Grand Rapids Public Museum School studied the Advanced Water Quality unit. Students worked in teams to become experts on one of three indicators of stream health: chemical, biological, and physical. Over the course of the fall semester, students visited four streams within the watershed to collect data, compare it to historical data, and assess overall stream health. Each team presented their findings to other students, parents, and community partners. In the spring, students learned about the Grand River Revitalization and Restoration Project as part of their study of city infrastructure and planning. Summation video available:  
<https://youtu.be/SmxrdZIWkbbk>

## **Products and Resources**

List and provide addresses for related websites that provide additional information or were developed for or through the project. Provide site title, full address, and a brief (one to two sentence) description of the relevant content.

- PBS Learning Media, PBS's online resources for educators worldwide, is hosting the educator resources. These three units for 6-12 science and social science teachers are a PBS "collection," which means they include easy-to-browse videos, handouts, and supplemental reading. Found here: <https://wgvu.pbslearningmedia.org/collection/river-re-wilding-evaluating-impacts-on-ecosystems-and-communities/>
- Groundswell, [www.groundswellmi.org](http://www.groundswellmi.org), also hosts many of the products of the grant here, including a link to a Google drive where educators can download and customize the instructional units: <https://www.gvsu.edu/groundswell/lesson-plans-54.htm>.
- YouTube, on the Groundswell channel, additionally hosts videos from the project here: <https://www.youtube.com/channel/UCN2SjT9QD-sN8T-JM24Ejpg>

List any other communications outlets, publications, media coverage, etc. for the work. If these are available online, please hyperlink the listing. Items that are *planned* or *in process* should be so designated.

- LGROW and Groundswell authored a one-page case study for distribution at the LGROW spring forum. It included descriptions and photographs of the student projects. It will be available on the Groundswell website.
- The KIH teacher, Brenda Perry, created her own set of macroinvertebrate identification cards for the Advanced Water Quality unit. The set contains photos and descriptions of 25 macros common to Michigan. Ms Perry designed a sorting lesson, aligned to Next Generation Science Standards, that helped students make connections between form and function. The cards were given to teachers at the 2019 Showcase event. A link to the cards (also found on PBS Learning Media) is here: <https://drive.google.com/file/d/15QCSQbwiue69y4dR04zDqtiKPyVD5pTL/view?usp=sharing>

## **FINAL NARRATIVE REPORT**

### ***Background/Overview***

#### **1. Briefly summarize the project description as outlined in the original proposal.**

- a. The mission of the RRES grant was to add educational support to the work of the Grand Rapids Whitewater Revitalization and Restoration project. Groundswell's

educational partners on the project were the Grand Valley Metropolitan Council (GVMC), WGVU Public Media (WGVU) and Kent Innovation High School (KIH). Together, our goal was to assist schools in implementing stewardship projects focused on watershed management and water quality.

2. **Was the project completed as originally intended? If not, indicate how the final outcome(s) differed from what was anticipated. Does your experience suggest that original expectations were realistic? What factors hindered or helped progress?**
  - a. The grant was completed successfully with all major products produced. The biggest hurdle we faced was finding a teaching team to beta test all three units. First, we wanted to make sure our second (beta) school was a Grand Rapids Public School, because urban schools tend to be more racially, ethnically, and socioeconomically diverse, as well as under-resourced. This narrowed our beta school choices somewhat. Then, most GRPS teachers we did approach in the spring of 2018 to beta test the lessons the following school year wanted to see the lessons before they committed to teaching them, and we couldn't produce them. This was because the alpha teacher writing the lessons needed the month of June to complete them. Once she had the lessons written, we were able to get one teacher at the Grand Rapids Public Museum School to commit to using them with his students. However, the Public Museum School is not under-resourced and does receive support from many community partners. Upon reflection, we realized that the alpha school draws on high school students interested in project-based learning from all over Kent County, so we do feel we had a balance of students represented in the project. If we were going to undertake a similar project, we would make sure to have the draft lessons in hand before trying to recruit a beta school. For future grants, we will better account for the timing needed to write the draft lessons and then present them to a beta school.

## **Outcomes**

3. **What activities were pursued in relationship to intended outcomes, and to what extent did you achieve the following intended outcomes listed in your proposal?**
  - a. Teacher PD
    - 1) Groundswell's Professional Development Committee developed a sequence of PD for teachers that supported schools' involvement and engagement in the effort.
    - 2) We hosted four professional development (PD) sessions, totally 12 hours of instruction/discussion/activities about the restoration effort: two, three-hour sessions on July 29<sup>th</sup>, 2018, on Advanced Water Quality (during Summer Institute) and two, three-hour sessions on November 8, 2018, on the Social and Economic impacts of the Whitewater projects (totaling 12 hours). These PDs were delivered in-person, recorded, edited, and then distributed online. The online component accommodates teachers who cannot attend the in-person trainings, expands the number of schools that could participate in the project, and provides foundational training that will endure beyond this project. In

producing online PD, Groundswell tapped expertise it developed while working with Kent ISD on a previous, successful project.

b. Instructional Units for Classroom Teachers

- 1) We developed three instructional units, aligned to Michigan Science Standards/Next Generation Science Standards. These provide teachers with a series of lessons focused on 1) Advanced Water Quality, 2) Grand Rapids Revitalization and Restoration Project, and 3) Social and Economic Impacts of the Grand River. These units serve as a curricular framework to support students' exploration of the Grand River and the associated revitalization effort in Grand Rapids. Flexibility within the units allow teachers to frame the lessons around their particular classroom goals and outcomes. This task was completed with Groundswell staff and a teacher, Brenda Perry, from Kent Innovation High School.
- 2) Teachers were able to attend the trainings provided by the grant.
- 3) Instructional units are hosted on PBSLearningMedia, as is media developed to support specific lessons.

c. Outdoor experiences were developed as extensions to the units and videos of the experiences were made available online at PBSLearningMedia.org and groundswellmi.org. The following four videos are now available on YouTube, on the Groundswell channel:

- 1) Project Overview and perspectives
- 2) Students Using Hester-Dendys for Stream Monitoring
- 3) Identifying, Counting, and Scoring Macros
- 4) River Walk: Exploring the Grand River - History and Future

d. Model school projects focused on the restoration

- 1) Both projects involved two schools, Kent Innovation High School (the alpha school) and the Grand Rapids Public Museum School (the beta school) learning about water quality and proposing ways to improve it.
  - In the first case study, at KIH, ninth-graders sampled macroinvertebrates from the Grand River and from a stream near their campus. They then studied macros' connection to water quality and completed independent research projects. Students presented their research to each other at the end of the unit. One student team presented their research to environmental professionals at the 2018 Lower Grand River Organization of Watersheds (LGROW) Spring Forum.
  - In the second case study, sixth-graders at the Grand Rapids Public Museum School studied the Advanced Water Quality unit. Students worked in teams to become experts on one of three indicators of stream health: chemical, biological, and physical. Over the course of the fall semester, students visited four streams within the watershed

to collect data, compare it to historical data, and assess overall stream health. Each team presented their findings to other students, parents, and community partners. In the spring, students learned about the Grand River Revitalization and Restoration Project as part of their study of city infrastructure and planning.

**4. What audience(s) were you particularly hopeful of reaching? To what extent did you reach them? Did you receive any feedback?**

Our primary audience for our content is K-12 and environmental educators. For the alpha and beta tests, we received feedback from participating teachers to improve our products.

**5. What relationships or opportunities were developed or strengthened through the work?**

The work with then GVMC and GRPM strengthened our mutual focus on the river restoration efforts. We are still actively participating in the local initiative and plan to further use grant products now that they are finished.

**6. Was an evaluation included as part of this project? If so, what were the key findings? (Please attach a copy of the evaluation report).** No.

**7. Whether they were intended or unintended, what do you consider the most important benefits or outcomes of this stewardship project?**

We believe the quality of the products will have a broader impact than just West Michigan. Our partners at PBS have utilized our content to implement new functionality on PBS Learning Media and we hope that this platform helps educators across the Great Lakes watershed utilize their plan.

***Related Efforts***

**8. Was this project a standalone effort or was there a broader effort beyond the part funded by the GLFT? Have other funders been involved either during the time of your GLFT grant or subsequently?**

This grant is a pass-through from the Wege Foundation, who is actively supporting the revitalization effort in Grand Rapids. We are working with the Grand Valley Metropolitan Council, the City of Grand Rapids, and local schools to further educational aspects of the work.

**9. Has there been any spinoff work or follow-up work related to this project?**

Not yet, no.

***Communication/Dissemination***

**10. List publications, presentations, websites, and other forms of formal dissemination of the project deliverables, tools, or results, including those that are *planned* or *in process*.**

Now that materials are complete, we plan to push awareness of the resources through social media outlets of participating partners GVMC, WGUVU, GRPS, Kent ISD, and

Groundswell/GVSU. The materials will also be highlighted at the National Association of Environmental Educators 2019 conference during our poster session. All materials, as stated earlier, are available on the national platform of PBS Learning Media and locally by the Groundswell website.

**11. Please characterize your efforts to distribute and encourage use of products, processes, programs, etc. developed through this grant.**

Partners are working to incorporate the materials into their existing offerings, and Groundswell will be highlighting the resources at our dinner and dialogue events. We will be promoting their use via our email communications to our teachers and working to incorporate their use into the Wege Foundation funded Grand Rapids Environmental Education Network planning for Grand Rapids Public Schools.

**Reflections**

**12. Please describe any unanticipated benefits, challenges, surprises, and/or important lessons learned over the course of the project.**

One unanticipated benefit was the quality and the format of the educational materials we received from the KIH teacher, Brenda Perry and from our LGROW educator, Eileen Boekestein. Ms. Perry wanted to make sure the lessons and materials she created were adaptable by teachers, so, in addition to the PDFs that are on PBSLM, we have them available on Google drive, where copies of them can be downloaded and edited. The link to this drive is on our website or at this bit.ly: <http://bit.ly/riverrewilding>. Within these units Ms. Perry and Ms. Boekestein created a wealth of place-based material, especially for the Advanced Water Quality unit: the set of Macro ID cards described earlier, two virtual walking tours of the Grand River downtown (one guided, one virtual; available at [bit.ly/walkwhitewater1](http://bit.ly/walkwhitewater1) and [bit.ly/walkwhitewater2](http://bit.ly/walkwhitewater2);) and two Google sheets teachers can download and use with their students. These sheets are formatted to calculate stream macroinvertebrate quality ([bit.ly/streammacro](http://bit.ly/streammacro)) and stream habitat health ([bit.ly/streamphys](http://bit.ly/streamphys)), once students have entered their data. The beta teacher at the Public Museum School (Tom Gibson) was very enthused about these spreadsheets and used them effectively with his sixth-grade students. These materials are exactly the sort of specific, place-based resource ecology teachers love and need.

**13. What recommendations (if any) would you make to other project directors working on similar efforts or to the GLFT?**

We would recommend project managers develop a handout on copyright for teachers whose lessons will be published on PBS Learning Media, especially what is in the public domain, what free and fair educational use means, and how to document sources so that copyright permission may be sought. We were eventually able to obtain all of the necessary permissions, but, had we provided our teacher with guidance up front, we would not have had to backtrack and hunt down bibliographic information after the fact.

**Attachments**

**14. Please attach any reports or materials developed through the grant.**

Lessons attached and case study document.