



Greening STEM Case Study: Enhancing a High School Natural Resource Program through Community Partnership

The Problem

If you're an educator, or work with one, you know it takes more than just imagination to get your good ideas for school projects off the ground. You need to have a clear plan of action that fits your curriculum and meets the goals of your school district while providing opportunities for students to learn in [new and exciting ways](#). Of course, even the most thoroughly planned projects can still falter.

Common Challenges to Creating High-Quality Learning Projects



Funding

Implementing high-quality and collaborative educational programming is costly.



Time

Federal agencies, nonprofits, and school district staff have limited time and capacity due to many duties and responsibilities.



Partnerships

A lack of connections and/or relevant project experience can make it difficult to attract and maintain strong partnerships.



Alignment

Federal agencies, nonprofits, and schools each have separate organizational missions and educational goals to satisfy.

The Solution

NEEF's [Greening STEM initiative](#) helps formal and informal educators engage students in STEM (science, technology, engineering, and math) activities to solve real-world challenges outside of the classroom. By working together to establish [partnerships](#) with school districts, friends groups, and land management agencies across the country, we help provide educators with the [resources they need](#) to realize their ideal student projects.

KEY PLAYERS

In 2020, NEEF collaborated with the USDA Forest Service (FS) to fund a Greening STEM Demonstration Project on the Hawaiian island of O'ahu. Community organizations and teachers identified a need for place-based education initiatives in the Pearl City community to rebuild the Natural Resource Program and integrate Hawaiian culture into the curriculum. The high school is situated within the Waiawa watershed between urban and forested areas and lacks green space.

NEEF Program Director, Robert Sendrey: expert in grantmaking and the Greening STEM model.

State & Private Forestry, USDA Forest Service Urban & Community Forestry Program Manager, Miranda Hutten

Hawaii Department of Land and Natural Resources, Urban Forestry Program, Dr. Heather McMillen

Hui o Ho`ohonua (HOH) Executive Director, Sandy Ward

Pearl City High School Natural Resource teacher, Jessica Stoerger

The Ko`olau Mountain Watershed Partnership Community Partner, Frankie Koethe

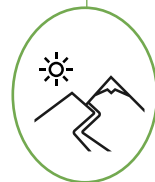


The Project

The \$10.5k sponsorship award from NEEF supported a holistic STEM program that infused agency science and resources into school curricula focused on student-directed investigations into local environmental issues. The funding allowed FS staff to partner with state foresters as well as formal and nonformal educators to design and deliver STEM programming that engaged youth from under-resourced and historically excluded communities in place-based citizen science.

Project Highlights

- Pearl City High School students learned about the health of the Waiawa watershed through **virtual classroom activities** and two optional forest field trips.
- School and community **volunteers helped build a native plant shade house** and restore the Natural Resource Center, which includes a weather station, on the school campus. The Natural Resource Program will use these resources for years to come.
- Students from Pearl City High School will **grow native plants** for HOH and the Ko`olau Mountain Watershed Partnership.
- Students **explored threats to the health of the watershed** including poor urban design, deforestation, and invasive species. They also **explored positive impacts on the watershed** such as forest preserves, watershed mountain partnerships, indigenous land management systems and community engagement in watershed protection and restoration.
- Students learned multiple data collection techniques as a result of this project and project partners aim to further enhance the **citizen science component** of their work in subsequent years.
- As a result of the Greening STEM project, **student enrollment in the Natural Resource Program tripled** and support for the program increased by school community members.



What is the NEEF Greening STEM Model?

The Greening STEM model is an interdisciplinary and collaborative approach to teaching STEM subjects that includes learning styles that are:

Place-based



Three-dimensional



Project-based



Community-based



FS, HOH, Ko`olau Mountain Watershed, and Pearl City High School educators collaborated to develop fully Greening STEM-aligned experiential curricula that exposed students to public lands and authentic science practices.

Why Use the Greening STEM Model?

NEEF's Greening STEM sponsorship award filled the need for dedicated funds for this collaborative education project. The funds supported costs associated with personnel, field trip fees, travel, and supplies.

The Greening STEM project at Waiawa watershed was a win-win for leveraging the skills and contributions of each partner to reach beneficial outcomes. By taking a holistic approach, NEEF was able to attain several agency-specific goals:

- ✓ **Promote environmental stewardship**
- ✓ **Develop student leadership**
- ✓ **Expose students to conservation careers**
- ✓ **Boost community engagement**
- ✓ **Reach high-needs communities**
- ✓ **Improve watershed health**

*"Hands and feet on the 'āina,
learning in a fun way
about stuff that matters."*

Pearl City High School Student

How to Get Involved with Greening STEM

Check out NEEF's [Greening STEM Hub](#), a collection of tools and resources to help engage learners of all ages with practical lessons in STEM that focus on real-world challenges within the natural environment, to download or use these resources.

Watch our [Greening STEM video series](#) highlighting the McInnis Canyons Greening STEM project and hear directly from the students and partner groups involved.

Sign up for [NEEF's email list](#) to stay on top of current funding opportunities and apply for a grant.

Interested in learning more about implementing a Greening STEM project? Reach out to NEEF's **Environmental Education Program Director, Robert Sendrey**, at rsendrey@neefusa.org for consultation.

