

BPA Education Grants 2012–2013 Final Report

FALL 2013



Students from Peter S. Ogden Elementary School in Vancouver designed and created this mural as part of their project, “Comparing the Power of Wind and Water,” funded by a BPA Education Grant.

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Executive Summary

BPA Education Grants are awarded to schools, non-profit organizations and government agencies to support projects that advance energy education in the Northwest. The goal of the grants program is to increase student awareness and understanding of how the region's energy system works, and to spark student interest in science, technology, engineering and math — skills that will be essential for the energy workforce of the future.

The Education Grants program was established in 2012 with a budget of \$20,000. Project funding was granted to seven applicants from a field of 22 proposals. Projects took place over the 2012/2013 school year. The table below summarizes the projects, funded organizations and amounts granted.

Project reach and cost

Funded projects reached a total of 24,875 students at a cost per student of 81 cents.

Publicity

The grants program was publicized when the applications were posted, and again when they were awarded. BPA distributed news releases and posted a story on the external web page. BPA also worked with customers and education groups to make the news of funding opportunities available to educators and non-profits. Funding recipients publicized their projects through news releases, newsletter articles, signage and print materials.

Results

With a relatively modest investment, BPA has provided resources for seven organizations to develop and offer meaningful education experiences for students. These experiences will serve to increase student understanding of the energy grid, and will also help students develop skills and knowledge to pursue studies and careers in scientific and engineering fields, helping to meet and solve the energy challenges of the future.

Organization	Project	Audience	Grant
Compass Academy	What Difference Does a Dam Make?	125 9 th and 10 th graders	\$2,813.38
Eastern Oregon Renewable Energies Nonprofit	Energy Awareness, Renewable Energy and Conservation Education for Outdoor School	35 3 rd and 4 th grade students	\$ 500.00
Franklin Conservation District	Water on Wheels and Wheat Week	23,070 K–8 th grade students	\$5,000.00
Lake Roosevelt High School	BPA Hydro Challenges: Green in So Many Ways	10 high school, 200 elementary and middle school	\$2,000.00
Peter S. Ogden Elementary	Comparing the Power of Water and Wind	290 elementary students and community members	\$ 285.52
Washington State University School of Engineering	Learning Fundamentals of Hydropower Education through Hands On Experiments	300 middle and high school students	\$4,990.00
Yakima Basin Environmental Education Program	Yakima Basin Kids in the Creek	845 4 th –7 th grade students	\$4,505.00

Compass Academy

Idaho Falls, Idaho

BPA provided funds for multifaceted research field trips and classroom projects focused on power generation and impacts to communities and river ecology for 9th and 10th grade students in biology, health and science classes.

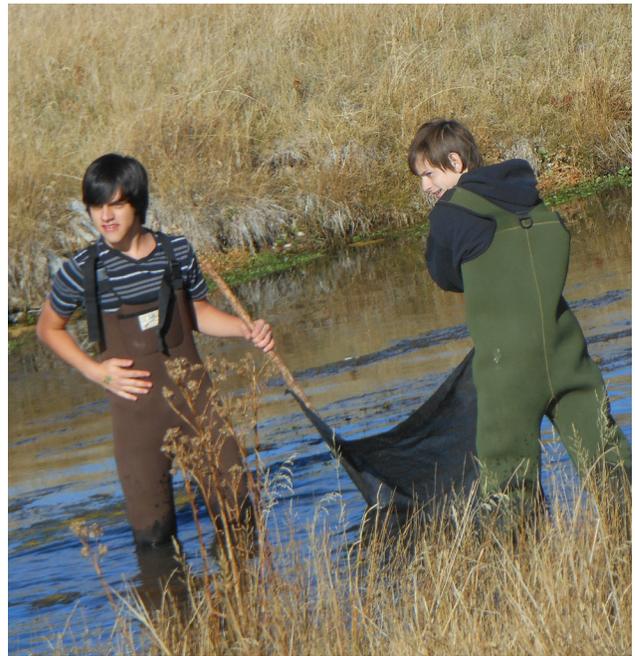
—“What Difference Does a Dam Make?” report prepared by Joseph Timchak

Students built electric motors and hydroelectric generators to better understand the relationship between electricity and magnetism. They visited an Idaho Falls Power hydroelectric plant to see real life applications of what they learned. Students investigated the amount of energy produced by several hydroelectric plants in the Columbia River drainage basin, the cost to build and maintain the power plants, as well as the benefits of dams for recreation, irrigation, power production, and wildlife. They then compared these costs and benefits to those of nuclear, coal, natural gas, solar and wind power.

Students learned how to classify macroinvertebrates, how environmental changes affect biodiversity, and how to conduct water quality index tests. They developed research and writing skills as they conducted research on electricity production, analyzed the information, and wrote reports and persuasive proposals based on their findings.

Number of students reached

125



Compass Academy students conducted water quality testing in Idaho’s Rainey Creek to determine if it was healthy habitat for Idaho’s state fish, the cutthroat trout. (Turns out, it was!)

Eastern Oregon Renewable Energies Nonprofit Corp.

Canyon City, Oregon

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BPA provided \$500 to fund hands-on energy and environmental learning sessions for 4th, 5th and 6th graders at Outdoor School in Grant County.

—“Energy Awareness” report prepared by Jennifer Barker

Students learned basic energy principles, such as the first law of thermodynamics and how energy transfers. They learned how energy is produced from natural resources, why it is important to conserve energy, and energy concepts such as relative energy density from wind, water and solar. Visual aids and hands-on learning reinforced the lessons. They learned the concept of a watershed, constructed watershed models and learned how to define their own watershed address. They also practiced mental math activities appropriate to grade level. The program was developed into an online curriculum called “Energy is all around us” which is available for other educators to use at www.solwest.org/news/archives.

Number of students reached

35; curriculum is available online for widespread use

Quote from participants

“The model of how the water collects and drains was cool. It’s fun making a reservoir with your hands!”

—Declan, 4th grade.



Students explore a watershed model, and demonstrate how their cupped hands can simulate a watershed.

Franklin Conservation District

Pasco, Washington

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BPA provided \$5,000 to support science and energy education field trips in eastern Washington.

—“Water on Wheels and Wheat Week” report prepared by Kara Kaelber

Students learned the importance of conserving water, soil, and energy, and learned about concepts like watersheds and energy systems. Through specific lessons on energy, students learned how hydropower works, and the importance of dams for hydropower, transportation, irrigation and recreation. They learned the difference between non-renewable and renewable energy sources, and the specifics of how hydroelectricity is created. The students modeled the system of hydroelectricity and then were given hydro pop-up models as reinforcement to take home. The program was able to fulfill classroom requirements for teachers to instruct on hydroelectricity in a tactile, hands-on manner.

Number of students reached

23,070



A fifth grader at Bethlehem Lutheran School in Kennewick, Wash., works on a model of a hydroelectric dam as part of a lesson on Hydropower as a System, delivered by the Franklin Conservation District.

Lake Roosevelt High School

Coulee Dam, Washington

BPA provided \$2,000 to support student multidisciplinary research projects on policy, science and societal issues surrounding hydroelectric generation.

—“Grand Coulee Dam” report prepared by Ralph Rise, Lake Roosevelt HS

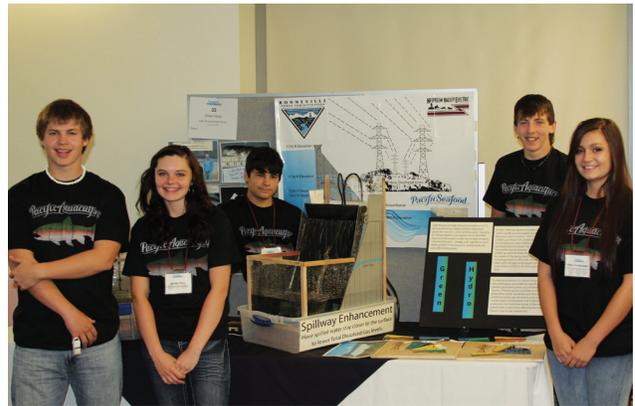
Students learned how to research and communicate about policy and economic issues facing hydroelectric power production and distribution. They gained an understanding of how science, technology, engineering, and math resources create solutions to challenges faced today and in the future.

Lake Roosevelt High School formed two project based learning teams to research policy and societal issues confronting hydroelectric power generation and to develop hands-on projects. Project teams also developed and disseminated a student produced educational curriculum to elementary and middle school students in the Grand Coulee Dam, Nespalem, and Keller school districts. Presentations were given to local community organizations and at the Imagine Tomorrow — Energy for the Future competition held at Washington State University in May 2013.

The teams had an opportunity to work with professional mentors. They learned how to communicate with experts working in the industry and how to develop and complete a project plan with a timeline. They gained valuable experience interacting with students and adults as educational materials and presentations were developed and presented.

Number of students reached

210



Lake Roosevelt High School's Imagine Tomorrow team at WSU.



Lake Roosevelt student demonstrates the operation of a student designed river system model.

Peter S. Ogden Elementary School

Vancouver, Washington

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BPA provided \$285.52 for a project comparing the power of water and wind for 5th grade students.

—“Comparing the Power of Water and Wind” report prepared by Carol Patrick

Students designed and constructed their own turbines with the goal of creating a device that is efficient and highly functional. They performed research to better understand the science of water and wind, learned to be analytical about testing protocols, to think creatively about solutions to problems, and to work collaboratively to get their project completed.

Students compared the similarities and differences of hydroelectric power and wind generated power. They researched the economics of both systems: cost, maintenance, output, dependability, environmental impacts, etc.

Students gained a concrete understanding of how mechanical energy is turned to electrical energy, and a better understanding of how electricity is generated in the Northwest.

The students became active environmental stewards as a result of their studies. They met with the mayor of Vancouver to learn more about projects affecting the river. They designed and created a mural for the mayor’s state of the city address, and they had a debate about wind power versus water power.

Their project was filmed by the Vancouver School District and posted on YouTube.

Number of students reached

290

Quotes from participants

“You have my heartfelt appreciation for helping me engage my students in current issues. We have all had an amazing year. Thank you so much for this grant.”

—Carol Patrick, 5th grade teacher



Students show off their projects.



Forest Rangers brought Salmon Golf: every hole demonstrated the obstacles salmon face to return to their original stream.



Wind turbines were demonstrated at Family Science Night.

Washington State University School of Engineering

Vancouver, Washington

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BPA provided \$4,990 to fund an outreach camp at WSU's Summer/Winter Science and Engineering Program.

— *“Learning Fundamentals of Hydropower Education through Hands-On Experiments”* report prepared by Praveen Sekhar, Washington State University

Middle and high school students were introduced to the fundamentals of hydropower generation and the role of renewable energy in meeting future demands. Students actively participated in identifying ways to improve the efficiency of hydropower generation. Students were made aware of the advantages of hydropower generation. The projects generated interest in science, technology, engineering and math (STEM) disciplines by explaining the benefits from pursuing a STEM degree and introducing students to potential careers in STEM disciplines and hydropower generation.

Number of students reached

300



Students construct a hydro wind kit at WSU Vancouver School of Engineering's Fundamentals of Hydropower Education summer camp.

Yakima Basin Environmental Education Program

Yakima, Washington

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BPA provided \$4,505 to conduct field trip wildlife education programs for students in central Washington.

— “Yakima Basin Kids in the Creek” report prepared by Tiffany Bishop

The Yakima Basin Environmental Education program delivered 47 outdoor field trip education sessions throughout central and eastern Washington State. These programs allowed students to wade in and conduct hands-on scientific activities including water quality and temperature testing and macroinvertebrate sampling and sorting.

Students learned about aquatic ecosystems, food webs, energy flow, biological classification systems, water quality, riparian zones, local organisms, how to conduct field sampling, how to recognize, separate and organize captured organisms, and how to analyze and prepare data.

Number of students reached

845



Students from Granger Middle School learn how to test the quality of water from the Yakima River.



For more information on BPA Science and Energy Education grants, please visit www.bpa.gov/goto/Education

bpa.gov/education

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