



## NOAA Pacific Services Center NOAA Coastal Services Center

# B-WET Hawai'i: Bay Watershed Education and Training

THE NOAA PACIFIC SERVICES CENTER'S BAY WATERSHED EDUCATION AND TRAINING (B-WET) HAWAII PROGRAM WAS ESTABLISHED IN 2004 TO IMPROVE THE UNDERSTANDING OF ENVIRONMENTAL STEWARDSHIP THROUGH EDUCATION FOR BOTH K-12 TEACHERS AND STUDENTS. B-WET HAWAII PROVIDES SUPPORT TO EXISTING ENVIRONMENTAL EDUCATION PROGRAMS, FOSTERS THE GROWTH OF NEW PROGRAMS, AND ENCOURAGES THE DEVELOPMENT OF PARTNERSHIPS AMONG ENVIRONMENTAL EDUCATORS AND PROGRAMS.

TO DATE, MORE THAN 19,000 STUDENTS AND 850 TEACHERS AND ADULTS HAVE BENEFITED FROM THE RESOURCES OFFERED BY B-WET HAWAII. PROJECT EFFORTS HAVE INCLUDED SCIENTIFIC RESEARCH, RESTORATION, GEOSPATIAL ACTIVITIES, AND THE PRESERVATION AND APPLICATION OF TRADITIONAL RESOURCE MANAGEMENT KNOWLEDGE AND PRACTICES.

## B-WET STORIES

### **Kaua'i Children's Discovery Museum (Kaua'i)**

This project combines traditional and modern resource management activities to bring together a community and elementary and middle school students. Students expand their awareness and understanding of the environment and ecology and increase their science literacy through hands-on activities. They learn how to use tools to measure, survey, monitor, and conduct field tests within a watershed, and their contributions add to the body of data on stream consistency, pollution sources, and debris.

### **University of Hawai'i, Hawai'i Institute of Marine Biology (O'ahu)**

This project, Watershed to Coral Health (WAtCH), teaches students to assess and monitor coral reef health and familiarizes students with coral research efforts within Kaneohe Bay on the island of O'ahu—the largest protected bay in the state. The students work in teams and focus on the impacts of invasive algae, coral bleaching, pollution, and terrestrial-based human activities. The project provides students with the necessary tools to understand the challenges faced in protecting and managing coral reefs and how current research is providing a better understanding of possible conservation and management methods.

### **Hawai'i Nature Center (Maui and O'ahu)**

The project provided 75 scholarships for Title I upper elementary classes on O'ahu and Maui to participate in the watershed curriculum program. Participants were engaged in a comprehensive, hands-on learning program that focused on the cultural and ecological aspects of (1) the forest's role in the watershed; (2) the unique role of wetlands and marshes; and (3) the role of humans in altering the natural environment from the mountains to the sea—the watershed ecosystem.



### **Moloka'i High School (Moloka'i)**

In partnership with The Nature Conservancy of Hawai'i, Moloka'i High School provided meaningful outdoor experiences to students through the *Waihona Mau a Mau* ("For an Everlasting Resource Base") project. Native Hawaiian epistemologies were used to foster environmental awareness and stewardship for Moloka'i's marine, estuary, and watershed ecosystems. Students collected data to assess the environmental health of streams, forests, and shorelines. The results were shared with other schools and the community through presentations, print, multi-media formats, and native Hawaiian cultural practices and art forms.

### **Community Conservation Network (Big Isle of Hawai'i, O'ahu, Kaua'i, Moloka'i, Maui)**

The Kupuna Wisdom Project engaged multi-generational participants of native Hawaiian elders (*kupuna*) with youth in marine management and stewardship activities. Youth ranging from elementary, middle, and high school students gathered and applied traditional and cultural resource knowledge from *kupuna* and documented this knowledge through multi-media technology. By integrating traditional and modern scientific investigations, students developed strategies to more effectively manage marine resources today and for the future. The project provided information to improve the environmental decision-making skills of teachers, students, and the community.

### **Waimea Valley Audubon Society (O'ahu)**

This project has two key components: Go with the Flow (Estuary Encounters) and the Service Learning Project. The estuary program is a site-based, hands-on program that engages lower elementary school students in watershed and stream ecology. The service project targets middle and high school students and nonformal educational groups and teaches skills development in best management practices in research and restoration activities.

### **Bishop Museum (Big Isle of Hawai'i)**

The Bishop Museum and the Hawai'i Biological Survey engaged native Hawaiian and local students in the ongoing restoration of Waipi'o Valley on the island of Hawai'i. Student scientists assessed the impacts of stream flow restoration on stream ecology and native aquatic ecosystems. Working in teams, the students made frequent field trips to the valley to conduct studies and collect data to monitor the valley's health. An interactive Web site was developed to monitor research progress, view data, download lesson plans and field reports, and allow participation in "virtual" stream activities.

### **Association of Fishponds of Maui ('Ao'ao O Na Loko I'a O Maui) (Maui, Lana'i, Moloka'i)**

This project engages middle and high school students on the islands of Maui, Moloka'i and Lana'i in a fishpond monitoring project near an ancient fishpond found within the National Oceanic and Atmospheric Administration's (NOAA) National Marine Sanctuary on Maui. Students assess and monitor the health of nearshore habitats in and outside of the fishpond, conduct species counts, address water quality issues, and are involved in collecting, recording, and analyzing data. This project also educates students and teachers about the history, culture, and practices of fishponds in Hawai'i.

### **Hawai'i Wildlife Fund (Maui)**

Wild Hawai'i provided opportunities for Maui County middle and high school students and teachers to investigate nearshore marine waters, streams, and Hawaiian cultural sites. Students were also introduced to the traditional *ahupua'a* management system (land division within watershed), which has allowed them to explore traditional resource management practices in concert with the scientific inquiry of streams, pools, wetlands, and other nearshore ecosystems.





### **Kapa`a Elementary School (Kaua`i)**

This student project aims to expand awareness and understanding of the environment and ecology and to increase science literacy through hands-on activities. Participating students will engage in activities to assess and monitor the health of the Kealia and Kapa`a river system and bays and contribute to restoration activities. Students will also research the past and present, and will use a variety of technology and media in the investigative process to measure, survey and conduct tests to recognize factors that indicate a healthy or impacted environment.

### **Maui Coastal Land Trust (Maui)**

The **student project** will incorporate the use of technology in both the field and in the classroom environments to monitor, evaluate, analyze and communicate newfound knowledge about the watershed. The Waihe`e Refuge is the designated outdoor laboratory to examine an integrated system of protected coastal dune, riparian, wetland and coastal strand environments, both from an environmental and cultural perspectives. Activities will involve a variety of scientific and technological methods including geo-spatial technology, data compilation, analysis and a multimedia presentation to an external group of environmental educators.

The **stand-alone teacher professional development project** builds capacity by engaging teachers from corresponding schools with similar training in the use of technology to support integrated environmental education learning approaches.

### **Malama Kai Foundation (Hawai`i Island)**

In partnership with **Kealakehe High School**, this student project will educate secondary students on the impact of urbanization on watersheds within the Kona community, where watersheds are under intense development pressure. Students will be engaged in a variety of indoor and outdoor activities that compare the health of an underdeveloped and developed watershed from the mountain to the sea. Activities include: GPS and GIS mapping; creating, managing and monitoring rain gauges and weather stations; building ROV's (Remotely Operated Vehicles) to collect submarine freshwater groundwater and lava tube offshore outflows; data collection, analysis and reporting; as well as restoration activities of native plants to improve the health of the watershed.

### **Kaho`olawe Island Reserve Commission (Multiple Islands)**

The project will support a series of professional development workshops for pre-service and in-service teachers designed to develop educational leadership in environmental conservation and Hawaiian stewardship for the island of Kaho`olawe. In particular, the workshops will combine scientific assessments and Hawaiian marine resource management techniques that will guide teachers in the development and implementation of lesson plans and resource materials to further student and teachers understanding of Hawaiian-based ocean resource management.

### **University of Hawaii at Hilo (Hawai`i Island)**

This project will engage students in outdoor learning experiences by relating human action on land to contamination of the Wailuku River and the effects on the characteristics of Hilo Bay. Students will also gain an understanding of cultural practices, environmental awareness and watershed stewardship through a variety of scientific investigations incorporated with geospatial technology approaches. Corresponding teachers will receive an introduction to the River Environment, Land-use & Ahupua`a Technologies (RELATE) program to support this learning approach.

### **Kohala Center (Hawai`i Island)**

This teacher professional development project will create a cadre of trained K-12 teachers skilled in place-based and problem-based environmental education and to enable them to incorporate the experiences in their classrooms. This program will serve as a resource to the participating teachers at several levels including: establishing a mentor and scientist-teacher support to create and implement class projects; provide direct assistance to teachers through program mini-grants; establish a website as a method to share information; establish an organization of Environmental Education Teachers; and host an Environmental Projects Conference.





<http://www.csc.noaa.gov/psc/bwet.html>

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