

PROGRESS REPORT

- 1) *Organization Title* - Kapaa Elementary School
- 2) *Project Title* - Kauai Watershed Project: Kapa'a's Community for sustainability, Understanding the Past, Connecting to the Present, and Leading the Future
- 3) *Award Number*-NA06MOS4730009
- 4) *Report Period* -2nd Semi-Annual Report
- 5) *Project Period* - Start and End dates - May I, 2006 to April 30, 2007
- 6) *Introduction:* To engage students in Meaningful Outdoor Experiences through assessing and monitoring the Kealia and Kapaa river systems and bay, and by conducting restoration activities.
- 7) *Purpose:* To implement an integrated environmental education program for students in the east Kauai'i watershed. Through Meaningful Outdoor Experiences and hands-on activities, students will investigate the health of the stream system and bays and take restorative action. Partners in this collaborative include the school, the Hawaii State Department of Land and Natural Resources (DLNR), the Kauai Water Department Project Wet, the Limu Restoration Project, the University of Hawaii, Kilauea Point and Refuge, and the Koke'e Discovery Center.
- 8) *Approach:*
 1. Continue to provide meaningful outdoor experiences for students (60) in grades 4 and 5 at Kapaa Elementary School.
 2. Continue to utilize meaningful outdoor experiences to create awareness of Kauai's:
 - a. Ahupua'a System - from the mountain to the sea
 - b. Habitats
 - c. Adaptations
 - d. Change
 3. Continue to promote the wellness and health of our island ecosystem by being stewards and "taking care of the land," Malama I Ka Aina a Me Ke Kai:
 - a. Land and ocean
 - b. Land and streams
 4. Continue to develop meaningful learning experiences that nurture a sense of place by putting students back in touch with nature causing them to be informed decision-makers and advocates for their local environment.
 5. Continue to build partnerships that will focus attention on Kauai's eastside Anahola to Kapa'a watershed and give students a common area of interest

and a respected voice in the community. A focus will be place on documenting the stories of the elders, our kupuna.

6. Continue to assess the environmental quality and health of the Kealia river (Kapaa stream), tributaries, shoreline, coral reef and bay and teach students how to document and interpret data.
7. Continue to teach and facilitate students in how to use scientific tools to measure, survey, monitor, conduct tests and to recognize factors that indicate a healthy or troubled environment.
8. Establish a system to contribute to the body of data regarding stream consistence and source of rubbish in environment and fish populations and health.
9. Continue to restore the habitat through rubbish and plant removal on land and in the streams and ocean,
10. Expand and continue to monitor and grow limu in Aliomanu Bay.
- 11 . Continue to monitor the repopulating of the o'opu in the Aliomanu to Kapaa watersheds and ocean.
12. Continue to expand awareness and understanding of the environment and ecology and increase science literacy through hands-on activities.
13. Continue to stimulate observation, motivate critical thinking, develop problem-solving skills, and raise students' social awareness and ability to contribute to the community.
14. Document the process and results through journals, posters, group reports, art, essays, photography and video and to educate the public, including the student population of the Kapaa Elementary School, through these media. The new information will be added to the present classroom and school websites that are available to the entire public.
15. Establish a communication process with the Kauai Children's Discovery Museum (KCDM) B-WET student team for their project, Malama Hoopili returning Hanamaulu Students will be encouraged to share their findings and processes of discovery through the use of a variety of technological communication tools.
16. Increase sophistication of the use of technology as a means of investigation and communication.
17. Investigate and create other partnerships that provide students with experiences during non-school hours (after school, vacations/ intersessions, and weekends).

9) *Results: Accomplishments* (Numbers align with approach goals, above)

1. To date, forty-seven 4th and 5th grade students are immersed in the program. The established grant award period doesn't align with a regular school year, so we missed out on working with students for several months over the summer break.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

2. Meaningful outdoor experiences

Students in both classes:

-visited Kokee Discover Center for extended visits of 3-4 days where they learned about the terrestrial environment, native Hawaiian plants, and the impact of invasive species in a Hawaiian forest.

- observed the impact of long-term erosion on the island creating the Waimea Canyon

Awareness of Kauai's:

- 'Ahupua'a

-Fourth grade students attended the 'Ike Pono presentation sponsored by Kamehameha Schools where they learned about the ahupua'a system covering the three main regions of the islands; (uka) the mountains, (kula) the valleys, and (kai) the ocean, and how this land to ocean system provided all the natural resources the Hawaiians depended on for food and shelter.

-Fifth grade students photographed the area around Kapaa stream at three locations between the mountains and the ocean.

- Habitats

- Fifth grade students collected sand, broken coral, crabs, shrimp, and fish to set up and monitor saltwater and freshwater tanks in the classroom.

- Fifth graders collected rocks, soil, small insects, and plants to create a terrarium in the classroom.

- Adaptations

-While in Kokee, the fifth grade students visited Iliou loop trail to examine the various adaptations native plants have made to exist in this unique environment.

- Students in both classes observed the impact introduced plant and animal species have had on the native forest.

- Fifth grade students observed the fin structures of o'opu which make it possible to cling to rocks in fast moving water and climb waterfalls.

- Change

- After seeing iMovie presentations of the Kealia area, students are able to see the vast difference in what exists in now (agricultural land), compared to 60 years ago (sugar mill surrounded by plantation homes and gardens).

- Students witnessed the massive takeover of introduced plants in the Kokee forest.

- Students photographed areas where current agricultural practices and urban development are having a negative impact on freshwater streams and reef health.

3. Stewards of our island ecosystem

A.. Land and Ocean – "Malama Me Ke Kai

- Three beach debris cleanups at Lydgate Park (Sept. 22, 2006, Dec. 5, 2006, and May 4, 2007)

- Beach clean up at 'Aliomanu and Anahola Bay on November 29-30,, 2006.

- January 15, 2007 - Community Work Day

Students, parents and teachers collaborated with ██████████. Accomplishments for that day included beach cleaning at 'Aliomanu and Anahola Bay, Activities

included setting new cages on the north end of 'Aliomanu Bay, and 4 limu cages at Anahola .

- February 14, 2007

Activities for this day included beach cleaning at 'Aliomanu and Anahola Bays. Rechecking the limu cages showed that limu were still visible in the cages. No limu leis were visible at 'Aliomanu Bay.

Anahola Bay cages were still in place and limu was visible in the cages. Cages were left in the water and will be checked again in May when weather conditions are better.

B. Land and Streams – “Malama I Ka 'Aina.

- Invasive Species removal by the 4th and 5th graders in the Koke'e Rainforest: Strategies were to remove the most disruptive weeds such as Kahili ginger (*Hedychium gardnerianum*), Strawberry guava (*Psidium cattleianum*) and Firetree (*Myrica faya*), from special ecological areas that contain relatively intact ecosystems.

- Two debris cleanups by the fifth graders along Kapaa Stream

- Fifth grade students are laminating signs they made to post along Kapaa Stream reminding residents not to release aquarium fish into the wild.

4. Promoting a “Sense of Place”

- [REDACTED]'s visited the 4th grade classroom and allowed students to interview him and his life experiences living on Kaua'i as a contributing community member of Anahola. He shared pictures and stories of ocean life, people, legends, fishing experiences, and historical sites of Anahola and 'Aliomanu.

- Students brain stormed what “Place” means to them.

- Students wrote about their “Special Place”.

- Students participated in discussions such as: What do I know about the place where I live? Where do things come from? How do I connect to the earth? What is my purpose as a human being?

- Students viewed the E-School Presentations for the last 2 years on our 'Aliomanu Limu and Kealia Stream Projects.

- Students viewed historic photos from the Kauai Museum and Kauai Historical Society documenting what used to exist within the Kealia/Kapaa watershed including:

McKee Sugar Mill

Plantation homes and community buildings for immigrant workers

Valley House: Home to the Spaulding family – McKee Sugar Mill owners

5. Community Partnerships

- [REDACTED] – Collaboration with Anahola community resident who is responsible for reintroducing limu on to the 'Aliomanu and Anahola Bay reefs with Kapa'a Elementary Grade 4 students.

- [REDACTED] - University of Hawai'i Professor working with Grade 4 students, promoting opportunities for students and teachers to connect the culture/science/technology/economics concepts to the local environment.

██████████ - University of Hawai'i Ocean Engineering Graduate student responsible for implementing the 'Aliomanu Limu Project in 1999, with grandfather, ██████████

Kauai Dept. of Water-Participation in Project Wet where students rotated through a series of stations for hands-on lessons in the water cycle, ground water, spring water, water conservation, freshwater delivery systems, wastewater management, and water movement through a variety of natural materials.

██████████ - DNLR - fifth grade classroom presentation on the value of Hawai'i's reefs and the human impact on them.

██████████ - Career Day speaker for fifth graders promoting environmentally sound agricultural practices as an East Kauai farmer.

6. Document water quality

Students have:

- Reviewed last year's data collection.
- Participated in cooperative learning discussions with last year's students who worked on the same project as 4th graders.
- Made initial interpretations of longitudinal data collected on Kapaa Stream over the past three years.
- Water quality testing (nitrate, phosphate, conductivity, coliform, temperature, turbidity, temperature, dissolved oxygen, odor, and pH) at three Kauai Stream locations each quarter.
- Identified several sources of runoff that may be impacting water quality.
- Collected data on the types of man-made ocean debris washing up on East Kauai beaches.
- Identified a variety of sources which may be responsible for the debris.
- Brainstormed ways to make the public more aware of the implications of rubbish tossed in our oceans and rivers.

7. Utilize scientific tools for monitoring

Students have been instructed in the safe and effective use of a variety of devices they're using to evaluate the health of our streams, estuaries, and bays, including:

- Handheld GPS devices to mark the locations of limu cages on the reef and stream monitoring sites.
- Electronic devices and scientific instruments to measure nitrates, phosphates, salinity, dissolved oxygen, temperature, pH, turbidity, and flow rate.
- Palms® to record data
- Digital cameras and video equipment to document the condition of the reef, beach, stream, and surrounding land.
- Microscopes to observe and draw macroinvertebrates found in leaf packs (mesh bags filled with dead leaves from native plants anchored in the stream for three weeks to collect invertebrates o'opu might be feeding on)

8. Establish system for reporting data collection

- Students are learning to use computer software to organize, graph, and record the data they're collecting:

Water quality
Fish population and health
Rubbish collection

- Student photographs and illustrations for their web site:
 - Five o'opu varieties found in Hawaii
 - Areas where the stream is in pristine condition
 - Areas where the stream is being negatively impacted
 - Area where students hope to restore native plant habitat

9. Restore the habitat

- Students have surveyed the population of native plants found at the Kapaa Stream estuary.
- Students have photographed native and invasive plants found near the stream
- Construction of the new bike path and bridge have had a huge impact on the area. Students hope to work with DNLR to restore native plants when the construction is completed.
- Three additional stream/ocean rubbish cleanup dates are scheduled before the end of the current school year.

10. Limu growth in Aliomanu Bay

4th grade students:

- Are growing more limu in the classroom to reintroduce to 'Aliomanu and Anahola Bay.
- Looking at new ways of reintroducing limu onto the reefs.
- Learning to identify various seaweed species present on our reefs.
- Experimenting with new ways of growing limu in aquarium tanks.

11. O'opu populations

Fifth grade students:

- Have set up freshwater and saltwater aquariums in the classroom to studying the habits of o'opu and other fish found in Kapaa streams and estuaries.
- Have made illustrations identifying the five species of o'opu found on Kauai.
- Have illustrated the life cycle of the o'opu.
- Have placed leaf packs in a variety of locations in the stream to collect macroinvertebrates (invertebrates large enough to be seen without a magnifying glass). The leaf packs are mesh bags filled with dried ti, banana, and hau leaves. They were anchored in the stream in a variety of stream conditions (slow moving, fast moving, and turbulent) to see where most of these organisms thrive. Students recorded their locations using handheld GPS devices. After three weeks, the packs were collected and brought back to the classroom. Several of the leaf packs had been washed away due to heavy rains. The students sorted through the leaves and collected the macroinvertebrates present, identifying a few they could match to illustrations. A variety of organisms were found in each of the packs. The packs anchored in the turbulent water had the smallest count.
- Are experimenting with feeding the macro-organisms to the o'opu to see what they thrive best on.

12. Hands-on environmental activities

Students have set up watershed models using diatomaceous earth (a material made up of dried plant plankton often used in pool filters) to look at the impact of development on erosion. They have experimented with a variety of scenarios where the addition of houses, parking lots, trees, heavy rain, and surface pollution can be observed and the results documented.

- 5th grader students participated in a variety of hands-on activities at the Kauai Dept. of Water Project Wet Day, increasing their understanding of freshwater sources on our island, conservation strategies they can implement in their own homes, and scientific properties of water.

13. Stimulate observation, critical thinking, and problem solving

To prepare to present at the Hawaii DOE eSchool Convention students:

- Viewed the digital photos and video taken on excursions and in the classroom.
- Selected the photos/footage that they felt best represented their investigations.
- Critiqued last year's iMovie presentation.
- Learned how to create an iMovie.
- Wrote a shoreline to organize their photos/footage and help the viewer better understand some of what they'd learned.
- Edited out images that didn't enhance the iMovie.
- Wrote titles and captions to help share their point of view.
- Brainstormed what needed to be said by the students as part of the presentation.
- Wrote scripts they would use for the presentation.
- Reviewed questions that were asked of students at last year's conference.
- Discussed what a quality presentation looked like.
- Practiced presenting in front of their classmates and in front of another class.
- Evaluated the presentations
- Traveled off-island and presented to approximately fifty educational professionals at the conference.
- Answered questions from the audience.

14. Document the process and results

January 16, 2007

International Pacific Marine Educators Conference Establishes Network to Protect the Ocean

Students participated in an online presentation at The International Pacific Marine Educators Conference (IPMEC), which brought together marine educators from 18 countries Jan. 15 to 18, 2007, in Honolulu. Students had the opportunity to share about their project via teleconferencing.

February 22, 2007

E School Conference

Making a Splash with N.O.A.A. How are we treating our neighborhood? What do we want to see it look like in ten years? When students conduct scientific research and collect authentic data in their own community, it can have a lifelong

impact. Students shared their place-based projects on limu restoration and 'o'opu preservation using a variety of technology.

'Aliomanu Limu Project

Students had the opportunity to share their experiences working with Mr. [REDACTED] and his methods on replenishing the limu maunuea (ogo) at 'Aliomanu and Anahola Bays. Students in preparation for these conferences worked on presentation skills, preparing their oral presentations, and preparing themselves for questions and answer sessions.

February 27, 2007

howcase of Promising Practices – GEAR UP

GEAR UP, which stands for Gaining Early Awareness and Readiness for Undergraduate Programs, is a federal program whose mission is to significantly increase the number of low-income students who are prepared to enter and succeed in post secondary education.

- This was an opportunity for five new students to share about successful initiatives that are fostering classroom learning, especially with technology.

April 24, 25, 27, and 30, 2007

Educating our Peers

Our class hosted Hands-On Science Sessions within our school and 19 classes tended the 45 – 50 minute sessions. Each session included sharing of our iMovie and breakout hands on science lessons where students became the teachers. The students were effective communicators with their presentations and explanations, complex thinkers when they responded to questions and community contributors when they worked together to create their projects. The students were also self-directed to take the initiative to work on the projects and creators of quality products with the projects and displays they have done. Students worked in small groups and provided the following activities:

1. Limu Press - Learn basic pressing techniques still used by scientist today. Create a postcard, notecard, or a framed picture.
2. Hawaiian Reef Coral and Limu at a Glance - Use microscopes to examine limu and coral from 'Aliomanu Bay.
3. Land to Sea Connection - Discover the Coral Communities, What does it eat, Who are its predators, and How is it adapted to survive on the reef.
4. Watershed - Experiment with models to simulate the effect waterfalls, rain, surf, and tsunamis have on erosion.
5. Surface tension - Learn how it affects the ability of water to float objects with higher density by floating paperclips on the surface.
6. Water Pollution - Add a variety of substances (detergent, oil, salt) to see how they affect surface tension by counting the number of drops of water that will “fit” on a penny with each contaminant.

15. Share progress with the Kauai Children's Discovery Museum's B-WET student team.

-Unable to address to date. This organization is in the process of reorganizing. We've asked them to have one of their participants share what they've been learning and let us know what they're offering as student activities over the summer break.

-Hopefully [REDACTED] a teacher at Waimea Canyon who took part in the project, will be able to speak with our students in the weeks ahead.

-We were able to meet with [REDACTED], a teacher at Kealakehe High School and a recipient of a B-WET Grant on the Big Island. He has offered to assist us in building an underwater ROV unit we could use to inspect and photograph our limu cages.

16. Increase technology use

Much of what we are doing in the classroom is new to our students. For most, this is their first experience with digital cameras, video, GPS and Palm® handheld devices, spreadsheet creation, data collection, and hands-on environmental study. Everyday use of these tools is both changing the way we teach and the way our students learn and share their understandings. It has had a huge impact on their ability to share what they've learned with a broad audience.

17. Partnerships for non-school hours

[REDACTED] - Kaiser High School Limu Project - ongoing sharing of progress and results

[REDACTED] - Kapa'a Middle School Science Teacher

Parents - took part in Saturday excursions to the upper regions of Kapaa Stream so students could place leafpacks in areas difficult to access during a normal school day.

Community Work Day with [REDACTED] - January 15, 2007

Parents and teachers had the opportunity to learn more about limu in the different bays of Anahola. They were able to plant limu at 'Aliomanu and Anahola Bays and had the opportunity to see first hand the conditions of our natural resources.

- 10) Evaluation: Describe the extent to which the project goals and objectives have been attained.
 - With the exception of sharing our progress with the students taking part in the Kauai Discovery Museum's B-WET project, we have made progress towards all of our project goals and objectives. Our students have a better understanding of our natural surroundings and have benefited from the vast variety of hands-on activities and technology available to them. Their enthusiasm is evident as they collaborate on various aspects of the project. They've invited students from our entire student body of 900+ students to share in hands-on experiences to help them better understand what's going on in the environment in our community.

- 11) Changes/Problems Encountered: outline any problems or programmatic or budgetary changes that have been made to the project.
 - The established grant award period doesn't align with a regular school year, so we missed out on working with students for several months over the summer

break. A no cost extension would allow us the opportunity to refine and complete the project supporting the original group of students. Additionally, the extension would afford the opportunity to engage another group of 48-54 students in the coming school year to participate in the refined program.

- We had anticipated some problems with accessing the funds from our grant, as other schools in the state of Hawaii had experienced some problems in this area. Fortunately, we were able to work with the DOE financial office from the start to set up an account that could be easily administered at our school. No problems have been encountered.

12) Feedback:

-Conference organizers for E-School expressed their appreciation for our student presenters and used video footage from their presentation at a National Science grant professional development day.

-Kapaa Elementary students from other classes sent piles of thank you letters following their hands-on experiences.

-Teachers expressed the hope that this would be an annual event for their students.

- "...when I'm explaining, the kids are actually learning things, not just having fun..." written reflection after presentations by [REDACTED], 5th grade student presenter.

- "It (hands-on presentation to students) was easier than E-School because they're kids, not teachers...I just had to simplify the words for little kids." written reflection after presentations by [REDACTED], 5th grade student presenter