



Photo 1: *Hibiscus sp.* This flower was photographed in Hale'iwa, O'ahu.

Our day began with the crossing of a time zone. We left the Hawaii Standard Time (HST) zone and entered the Hawaii-Aleutian Daylight Time (HADT) zone, putting us one hour ahead. Those who didn't change their clocks were late for class and didn't get to enjoy a breakfast of pancakes, bacon, sausage, eggs, fresh fruit, bagels, croissants and yogurt.

Classes resumed this morning with our rotating schedule of Bathymetry, Geology, and Physical Oceanography. Tom Best, resident Bathymetrist, taught, the *KAATN Predators* about mapping the seafloor. The newest volcano in the long chain of Hawaiian Islands is Loihi. The summit of Loihi is only 975m from the surface. It is predicted to crest the surface of the Pacific in 10-100,000 years. Since the mapping that was completed yesterday left gaps in the data, Tom will have to manually insert these data using his "best guess" to complete the underwater topography of the seafloor and the seamount.



Photo 2: Tom Best is answering questions about mapping the ocean floor.



Photo 3: This is real time data taken of the mapping of Loihi, Hawaii's newest "island."

A.J. Pearson, resident Physical Oceanographer, taught the *Makoa Wahines* about the properties of seawater and the need for knowing these data. There was a discussion about pycnoclines, thermoclines, and haloclines and how these parameters bend sound. There were technical difficulties this morning with the 200m XBT probes. The first three deployed were deformed and malfunctioned. The first XBT fell apart in the launcher, with the lead head separating from the plastic piece that contained the copper which transmits the data to the ship's computers. The second XBT disintegrated in A.J.'s hand as he was attempting to load it in the launcher. The third XBT malfunctioned with pieces being scattered across the deck. The fourth and final XBT used this morning was an 800m; it was removed from a new container, and it worked properly. This XBT was launched from latitude, $23^{\circ} 33.3389$ N and longitude, $147^{\circ} 42.1709$ W. The graph was developed from on-board software documenting a beginning temperature of approximately 25° C and a final temperature of approximately 4.5° C at 760m depth.



Photo 4: A.J. Pearson displays for Ruthis Hollis the CTD Rosette.



Photo 5: A.J. Pearson demonstrates the mechanism for firing a Niskin Bottle.

Misty Savell, Geologist onboard, taught the *GEWS* about plate tectonics, seafloor spreading, sediment transfer, and grain-size analyses. She touched on the topic of “hot spots” and described the one found underneath the newest Hawaiian Island forming today. A hot spot is a thermal plume in a fixed location, which rises to the surface. The Pacific plate is moving away from this hot spot in a west-northwesterly direction, leaving a trail of island arcs behind. This hot spot is presumed to be over 75 million years-old. Hawaii has five subaerial volcanoes: Kohala, Hanalalai, Mauna Loa, Mauna Kea, and Kilauea. Mauna Kea is the tallest at 4,206m and Mauna Loa is the largest, covering 50% of the Big Island of Hawaii. Loihi, which is forming over the hot spot now, is located 18-20 miles southeast of the Big Island and is expected to rise in 10-100,000 years.



Photo 6: Misty Savell is teaching the *GEWS* about the Hawaiian Island Arc.

Lunch was served promptly at 11:30 with a delicious array of roasted chicken, pizza, nachos, carrots, and green beans, as well as fresh avocado and salsa. After lunch, we divided into our groups once again and went on a tour of the ship. Senor Naval Representative (SNR), Mark Jarrett, after a brief, post-lunch nap took the first group, *Makoa Wahines* on a tour to the bottom of the ship to view the transducers.



Photo 7: After lunch is brief siesta time for many Sea Scholars.



Photo 8: This photo is of the transducers, which are used for bathymetry and seafloor mapping.



Photo 9: Dave Schuyler, the Electronics Technician, is giving a tour of the NAVO supply room.



Photo 10 (above) and 11 (below): The SNR, Mark Jarrett gave a tour of his office; Medical Services Officer (MSO), Sherry Griffin, poses in front of her onboard medical facility.



Photo 11: Chief Mate, Stanley Breedlove, gave a second tour of the ship.



Photo 12: The Gyro Compass is stored below on the Deck 3.



Photo 13: This is the hatch that leads to the Bow Thruster Room.

Chief Mate, Stanley Breedlove, provided a second tour below the main deck. First, he showed us where the water-maker was located. Once underway, the ship uses two, reverse osmosis units, each capable of making 4,000 gallons of water a day. Across the passageway was the Gyro Room, where the Gyro Compass is located. This compass supplies directional needs to all navigational equipment and radars on board. Next, the Chief Mate, led us “up” one deck to the Boatswain’s Room and “pointed-out” the hatch that leads to the Bow Thruster Room. The Bow Thruster is used only during mooring, unmooring (moving toward or away from a dock), or when the ship is performing dynamic positioning, which is when the ship is trying to “hold fast” to a certain position. Next, we went on the weather deck (any deck outside is called a weather deck). We were actually on the leeward side of the ship; however, the wind was extremely strong.



Photo 14: The *Makoa Wahines* are on the weather deck. **Photo 15:** Mary Ruch is following the Chief Mate’s rules of one hand for you and one hand for the ship.

Dinner was a choice of meatloaf or baked chicken with gravy, mozzarella cheese sticks, carrots, mashed potatoes, fresh fruit, and salad. The *Makoa Wahines* were invited to the Bridge for a tour. They met the Chief Mate and he introduced them to “state of the art” navigational components comprising the Bridge’s electronic controls.



Photo 16: Carol Ann Drane and Lt. Crapo are at the helm.



Photo 17: The Chief Mate is describing the radar.

The evening presentations were given by Rita Kaplan and Mary Ruch. Rita presented an activity on the water cycle that can be implemented using a plastic bag, sand, and water. Mary provided the Sea Scholars with Internet resources, i.e., learning to speak like a pirate, the history of piracy (facts and legends), and pirate activities. Mary provided Elk Jerky and a Spud Bar as we learned about CPS (Classroom Performance System), an automated computer program capable of recording student results and subsequent analyses.



Photo 18: Rita Kaplan demonstrating her water cycle in a bag activity.



Photo 19: “Arrrrghhh, matie, here’s a treasure; try me spud baaaarrrrr!”

~Tami Wells and Joan Turner