

## Oceanographic Survey -- Entry 2

With only three days to go, we're in full swing getting ready for our departure. This involves assembling the equipment we'll need to do our oceanographic sampling, as well as preparing ourselves for 18 days at sea. The NOAA Ship *Oscar Elton Sette* (<http://www.moc.noaa.gov/os/>) is the primary research vessel we use here in Hawaii and is quite a comfortable ship. The idea of going out on the ocean in the "middle of nowhere" might make many people scratch their head, so we thought that we would give a bit more background as to why it's important to study this region.

As I mentioned in the first post, we have been taking oceanographic samples in this area along a similar route or path in the ocean (called a survey transect) since the 1990s, when the cruises were begun by Dr. Michael Seki of the NOAA Pacific Islands Fisheries Science Center. The series of measurements along the survey transect gave our NOAA scientists great insights into how the ocean's physics, chemistry, and biology change both over space and time. At the same time scientists were studying the movement and migration patterns of large pelagic (open ocean) animals in the North Pacific, and were finding that many animals used the transition zone as a "migration pathway", meaning that they would travel across the Pacific in the transition zone, even as it shifted northward or southward with changes in the seasons. Scientists at our Science Center such as Dr. Seki and Dr. Jeffrey Polovina combined information discovered on the transition zone cruises with other information collected and reported to NOAA by fishermen catching swordfish in the area. Dr. Polovina and his research colleague George Balazs also studied information on movements of loggerhead sea turtles in the transition zone relayed to NOAA by satellite transmitters attached to the shells of the turtles.



NOAA Ship *Oscar Elton Sette*

Researchers saw from these cruises and related studies that the surface and subsurface features of the transition zone, including their location, not only changed with the seasons, but also changed between years. These changes are important both to the animals that migrate across the Pacific and animals such as the endangered Hawaiian monk seal that live in the Northwestern Hawaiian Islands. PIFSC scientist Dr. Jason Baker, a monk seal expert, led a project which concluded that the welfare of monk seals during their first years of life depends on biological productivity of waters near the islands, which in turn may depend on how close the North Pacific Transition Zone comes to the Northwestern Hawaii Islands. This is important for monk seal scientists to understand, as the Hawaiian monk seal is one of the rarest marine mammals in the world. Knowledge of how changes in the environment affect these seals may help with monk seal conservation.

As you can see, the North Pacific Transition Zone is an important region for many animals. Many scientists have studied this region over the past 10-15 years, especially with the development of satellites that can measure many surface properties of the ocean from space. Through the use of these satellites we can see how the ocean changes over time. But it is only by measuring the ocean directly from a research ship that we can obtain the complete picture of how the ocean changes over time and space.

We'll be back in a day or two to continue with an explanation of the tools we use to measure the properties of the ocean we want to understand.