



NOAA Teacher at Sea
Beth Lancaster
Onboard NOAA Ship McARTHUR II
April 6 – 14, 2008

NOAA Teacher at Sea: Beth A. Lancaster
NOAA Ship McARTHUR II

Mission: Examine the spatial and temporal relationships between zooplankton, top predators, and oceanographic processes in the Gulf of the Farallones and Cordell Bank.

Project Collaborators: This mission is the result of a collaboration between PRBO Conservation Science and Cordell Bank and Gulf of the Farallones National Marine Sanctuaries. The primary investigator for this cruise is Dr. Jaime Jahncke (PRBO) collaborating with Chief Scientist Dr. Lisa Etherington (NOAA.)

Geographical Area: Pacific Ocean, Cordell Bank National Marine Sanctuary and Farallones Escarpment.

Date: April 9, 2008

Weather Data from the Bridge

Range throughout the day for April 7, 2008

Wind – Northwest 20 – 35 knots

Swell Waves – 4-12 feet

Sea Water Temp – 9.4 – 10.5°C

Figure 1 shows a 24-hour forecast of sea conditions for April 7, 2008 off the West Coast of the United States. The red section indicates swells that range from 12 to 15 feet. The weather reports collected from the bridge of the McARTHUR II reported that the waters traveled over the course of the day did in fact reach 12 feet. The winds from the northwest cause an upwelling

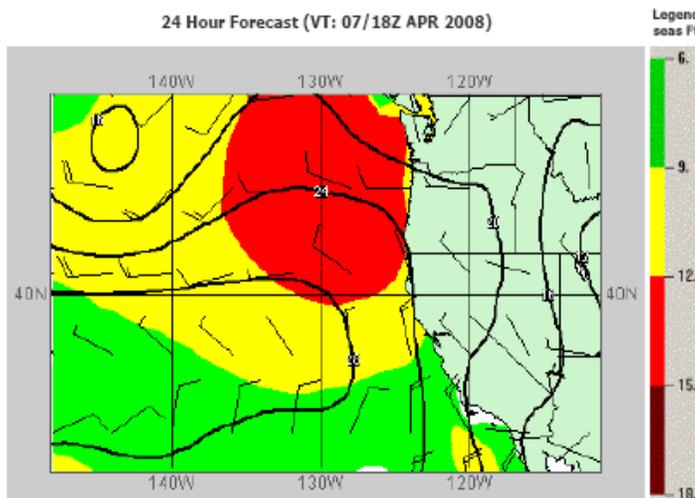


Figure 1: 24-hour forecast for April 7, 2008 sea conditions for West Coast of United States.

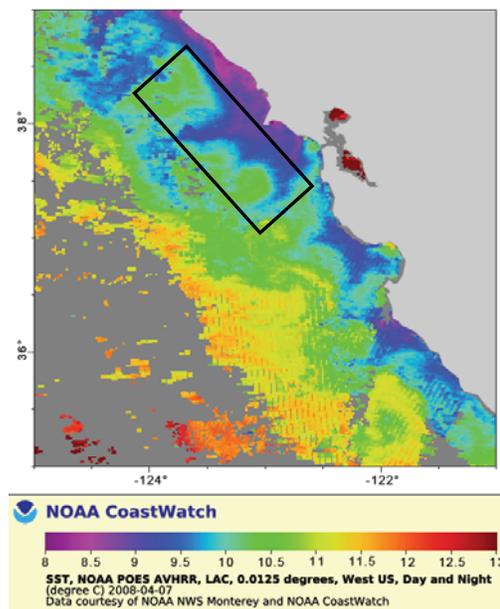


Figure 2: April 7, 2008 reported sea surface temperatures for the California coast from satellite data. The region of sampling is indicated by the box.

effect, which brings deep, nutrient-rich cooler waters to the continental shelf area off the coast of California. This nutrient-rich water plays a large role in the food web of the area, increasing primary productivity, which will then result in large numbers of marine mammals and birds due to the availability of prey items. Figure 2 shows the reported sea surface temperatures from April 7, 2008 for coastal California from satellite data. The coastal wind did in fact cause an upwelling and cooling of water along the coast. The purple area indicates temperatures 8-8.5°C and the blue 8.6-10°C. This period of upwelling in the area of Cordell Bank and Gulf of the Farallones National Marine Sanctuaries marks the beginning of a productive time of year.

Science and Technology Log

Part of the mission on this cruise is to gather oceanographic processes data to look at the relationship between biotic (living) and abiotic (nonliving) factors within the study area. While many samples are being collected through observation and survey equipment outside of the ship, there is just as much being collected in the laboratory onboard the McArthur II.

The ship is equipped with several pieces of equipment that report physical features and measurements throughout the day. This information is recorded for scientists onboard to utilize in their data analysis. The following is a list of equipment, and their functions being used to measure oceanic processes:

Thermosalinograph (TSG) – Surface water is pumped from the ocean through a hose to this piece of equipment which measures temperature and salinity. There is an additional probe that measures CO₂. All information collected during the course of the cruise will be given to researchers to use in data analysis.

Scientific Echosounder – Sends a sound wave into the water column. If there is anything in the water column this sound wave will reflect back to the ship. The longer it takes for the reflected wave to get back to the ship the farther away the target is. Comparing three different frequencies emitted by the echosounder allow scientists to identify different types of plankton in the water column, and set sampling sites.

Navigation Software – Allows researchers to track where they have been and where they are going. Because nets and other equipment are being deployed from the ship this computer software allows scientists to view the charted underwater topography to determine placement and depth of equipment. By marking sample sites using the software,



NOAA Teacher at Sea Beth Lancaster (left) and NOAA Chief scientist Dr. Lisa Etherington (right) view sampling areas using navigation software in the McARTHUR II's dry lab.

scientists can look at the relationship between the ocean's topography and living organisms collected.

Personal Log

I have been onboard the McARTHUR II for four days, and have enjoyed every minute of helping out with the research project. Scientists have been so patient and willing to answer all of my questions. The crewmembers onboard the McARTHUR II are very friendly and helpful. I now have a much better understanding of the marine physical environment than I did upon my arrival! I am enjoying living at sea, even the small bunks! The ship is actually very large you would never know there were more than twenty people onboard!



Pteropod collected from a hoop net.

Animals Seen April 9, 2008

Above the water:

Black-footed Albatross
Pigeon Guillemot
Brandt's Cormorant
Sooty Shearwater
Northern Fulmar
Black-legged Kittiwake
California Gull
Western Gull
Common Murre
Cassin's Auklet
Rhinoceros Auklet
Bonaparte's Gull

From the water:

Pteropod
Copepods
Ctenophore
Krill
Microscopic Plankton