



NOAA Teacher at Sea
Karen Matsumoto
Onboard NOAA Ship *Oscar Elton Sette*
April 19 – May 4, 2010

NOAA Teacher at Sea: Karen Matsumoto

NOAA Ship: *Oscar Elton Sette*

Mission: Transit/Acoustic Cetacean Survey

Geographical Area: North Pacific Ocean; transit from Guam to Oahu, Hawaii, including Wake Is.

Date: Thursday and Thursday April 29, 2010 (Twice! We crossed the International Dateline!)

Science and Technology Log

We passed over a seamount, which is an undersea mountain that rises from the seafloor (usually volcanic) to an elevation below sea level. Seamounts often project upwards into shallower zones and are more inviting to sea life, which provide habitats for marine species that are not found on or around the surrounding deeper ocean bottom. This may explain the numerous sightings we have experienced the past couple days.

In addition to simply providing physical presence, the seamount itself may deflect deep currents and create upwelling. This process can bring nutrients into the photosynthetic zone, producing an area of activity in an otherwise desert-like open ocean. These seamount areas may be vital stopping points for some migratory animals such as whales and seabirds. Some recent research also indicates that whales may use seamount features as navigational aids throughout their migration.

I have been working primarily with the acoustics group, launching and monitoring sonobuoys. Over the past couple days, we have detected minke whale boings and sperm whale clicks on a consistent basis. Our sonobuoys did not pick up the whistles of the melon headed whales, but these high frequency whistles were showing up on the towed hydrophone array. Often when visual sightings are reported to acoustics from the “flying bridge” observation deck, we have long been monitoring their vocalizations!



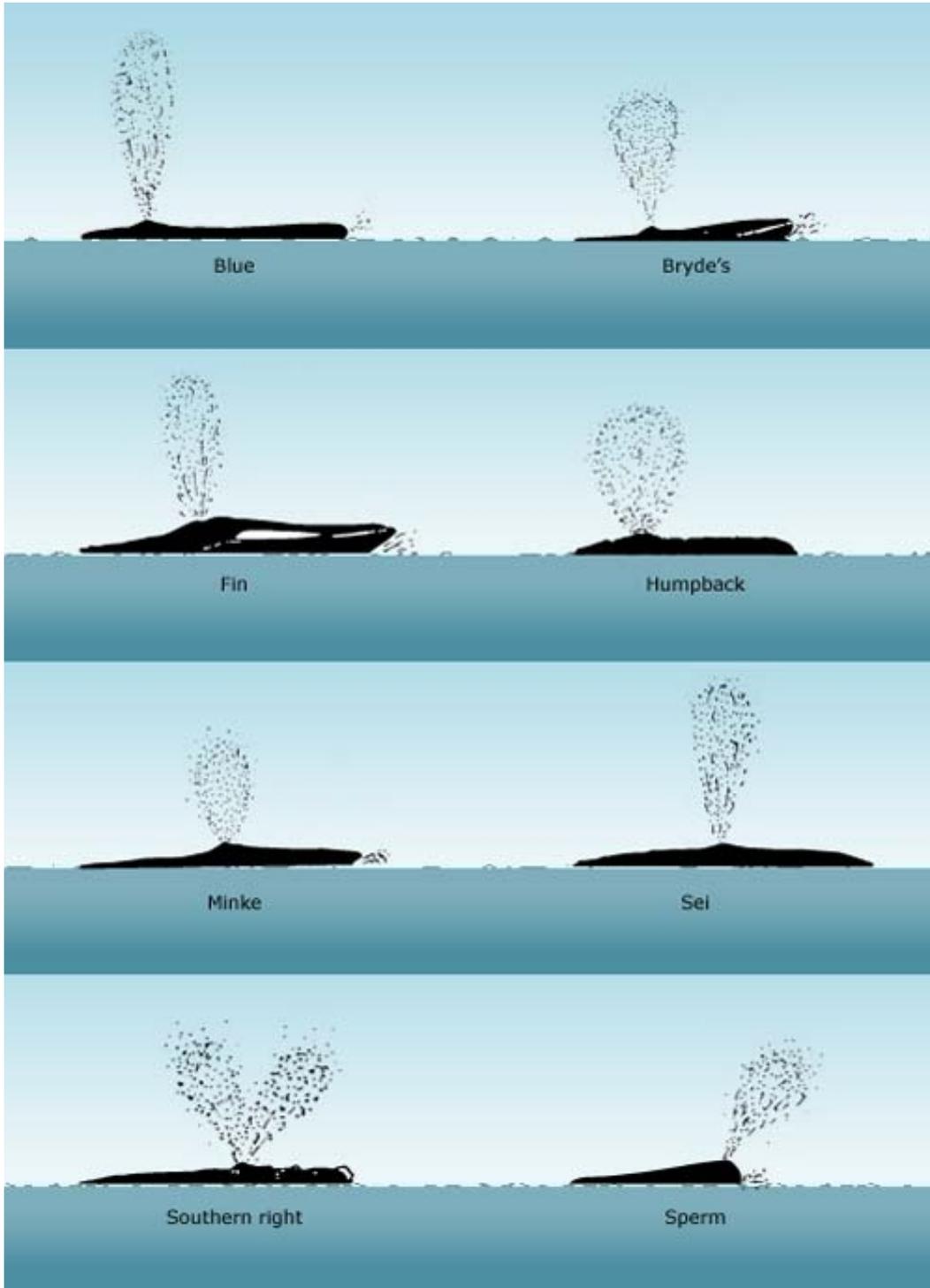
Left: Sperm Whale. NOAA photo

Finding and observing cetaceans while at sea is very challenging, and viewing conditions are strongly dependent on weather and sea conditions. I also spent a couple days with the visual monitoring team up on the “flying bridge.” Because we are looking for visual observation cues up to a distance of several miles using the “Big Eyes” binoculars, it is critical that the observer pick up on whale and dolphin “signs” other than seeing the animals themselves out of the water. These signs include blows, splashing, dorsal fins at the surface of the water, or the presence of congregating sea birds.

A trained whale observer, like a seasoned birder, is able to pick out distinguishing characteristics from a distance, including the shape and size of the “blows”. Each species has a distinctive blow due to differences in blowhole (nostril) placement, number of blowholes, and the amount of time the whale can go between blows.



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Direction and shape of blows of the main whale species.

Source: Alan N. Baker, Whales and dolphins of New Zealand and Australia: an identification guide. Wellington: Victoria University Press, 1999, pp. 42–43



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Personal Log

It was a terrific two days for the research team. We had a record number of sightings, including my first whale sighting on the “Big Eyes”! It was really exciting to be the first person on a whale sighting event. I first noticed it’s “blow” which led to me seeing others. I guess I now understand the phrase, “Thar she blows” through firsthand experience!

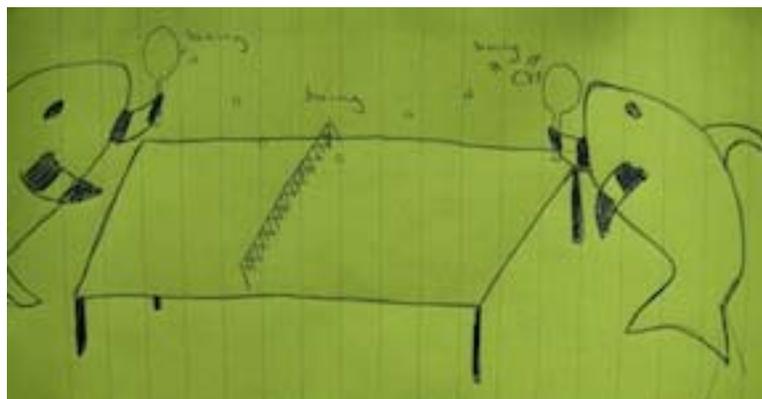
We had a full moon on April 29th, and we also crossed the International Dateline. We should have watched the movie “Groundhog Day” last night on board the ship!

I had fun helping out with dinner, and made Vietnamese salad with Doc and helped Jay and Randy with the mashed potatoes. Randy also made his most famous cheese and dill biscuits, which are heavenly!



Left: Jay, steward and cook aboard the *Sette* and Karen making mashed potatoes for dinner.
Right: Cook Randy’s glorious cheese and herb biscuits!

In acoustics, we have been monitoring the vocalizations of several cetaceans that we have not seen through visual observations. Amanda, one of our acousticians (I never heard of this profession before – it means acoustics specialist!) has also been monitoring minke whale boings. This is her interpretation of what we could be hearing:



Question of the Day: If it is Thursday on the east side of the International Date Line what day is it on the west side?



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What is the International Dateline?

The International Date Line is the imaginary line on the Earth that separates two consecutive calendar days. The date in the Eastern hemisphere, to the left of the line, is always one day ahead of the date in the Western hemisphere. The dateline has been recognized as a matter of convenience and has no force in international law.

Without the International Date Line travelers going westward would discover that when they returned home, one day more than they thought had passed, even though they had kept careful tally of the days. This first happened to Magellan's crew after their circumnavigation of the world. A person traveling eastward would find that one fewer days had elapsed than recorded, which is what happened to Phineas Fogg in "Around the World in Eighty Days" by Jules Verne (which allowed Fogg to win his bet when he thought he had lost!).

In celebration of crossing the dateline, the Sette crew launched expired signal flares as a "safety exercise"! I had similar signal flares before when I had a boat, but have never used them before! The crew let me light one off. Pretty exciting!



Sette Officer Mike Marino showing how to set off the trigger for the signal flare.

New Term/Phrase/Word of the Day: Blow

A blow is a visible cloud of warm, moist air expelled from a whale's lungs as it surfaces. It can appear low and bushy, or tall and columnar, depending on the species. Blows are used as a feature in identifying cetaceans in the field.

The blowhole is really a nostril, or respiratory opening of a cetacean. Odontocetes, toothed whales have one blowhole, and mysticetes, the baleen whales have two.

Did you know that:

Sperm whales form stable, long-term groups made up of females which form the core of sperm whale society. These groups consist of about a dozen adult females accompanied by their female and young male offspring. Males about six years or older leave their mother's group to join all-male bachelor groups called "bachelor schools". As the male sperm whales become older, they leave the



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bachelor group and essentially become solitary during their prime breeding years and in old age. Matriarchy is common among whale societies.

Animals Seen Today:

- Sooty tern
- White-tailed tropic bird
- Red-footed albatross
- Melon headed whales
- Sperm whales

Animals Heard Today:

- Sperm whales
- Melon headed whales
- Minke whales



Full moon from the Sette at daybreak, the day we crossed the international dateline.