



**NOAA Teacher at Sea**  
**Jennifer Fry**  
**Onboard NOAA Ship *Miller Freeman***  
**July 14 – 29, 2009**

**NOAA Teacher at Sea: Jennifer Fry**

NOAA Ship *Miller Freeman* (link: <http://www.moc.noaa.gov/mf/>)

Current location of ship: [www.shiptracker.noaa.gov](http://www.shiptracker.noaa.gov) (choose *Miller Freeman*)

Mission: 2009 United States/Canada Pacific Hake Acoustic Survey

Geographical area of cruise: North Pacific Ocean from Monterey, CA to British Columbia, CA.

Date: July 28, 2009

**Weather Data from the Bridge**

Wind speed: 17 knots

Wind direction: 345° from the north

Visibility: 8 nautical miles /clear

Temperature: 16.8°C (dry bulb); 11.6°C (wet bulb)

Sea water temperature: 15.5°C

Wave height: 3-5 ft.

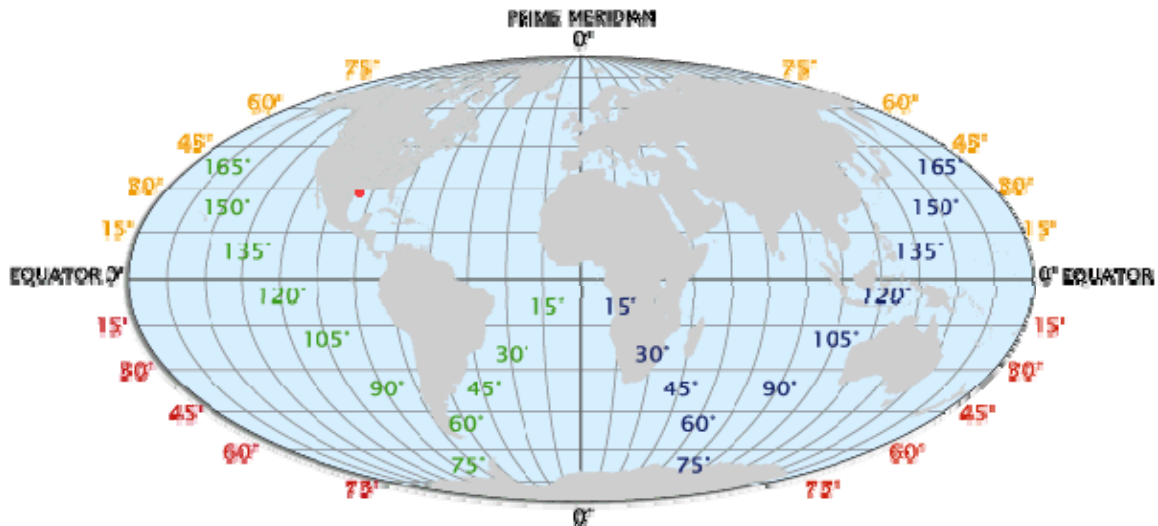
Air pressure: 1012.9 millibars

**Weather note:** Millibars is a metric unit used to measure the pressure of the air.

**Science and Technology Log**

***Weather Instruments and Predicting Weather***

Everything that happens out at sea is dependent upon the weather forecasts. Throughout history man has used a variety of instruments to acquire accurate weather information. The *Miller Freeman* is equipped with state of art weather reporting instruments. Every 3 hours weather data is sent to the National Weather Service to help predict the weather at sea. Once again accuracy in reporting data is paramount.



Map of the world showing longitude and latitude lines

**Global Position:** The *Miller Freeman* has several methods by which to determine longitude and latitude, which is our position in the ocean or on land. There are 2 G.P.S. systems on the bridge, a magnetic compass, a gyro compass, and radar. These instruments help determine the ship's position.



Lt Oliver Brown, surrounded by navigational tools, and Fishery Scientist Steve DeBlois make observations on the bridge of the *Miller Freeman*.



A view from the bridge of the *Miller Freeman*, NOAA Corps Officers LTJg Jennifer King and Heather Moes carefully lookout for marine mammals before doing a fishing trawl.



A Gyrocompass (left) and Magnetic Compass (right) with cardinal headings including north, south, east, and west

**True north:** The actual location of a point on the earth related to the north pole.

**Magnetic north:** Caused by the magnetic pull on the earth. Magnetic north heading is different depending on where you are on the earth, for instance, Magnetic north in Oregon has a variation of 16.45° east from true north. Southern California has a variation of 13.3° east from true north.

**Temperature:** Measured by a thermometer, units used are Celsius.

Dry bulb: Measures air temperature

Wet bulb: Uses a thermometer wrapped in a wet cloth.

The dry and wet temperatures together give the dew point and help to determine humidity

**Wind Speed:** Measured in knots using an anemometer, or estimated by using the Beaufort scale. The Beaufort scale uses observations of the sea surface, and the effects of wind on people or objects aboard ship to estimate the wind speed.

**Wind Direction:** Is measured by what direction in which the wind is coming.

**Cloud Height/Type:** measured visually

**Cloud Type:** measured visually using a variety of names of clouds depending on their patterning and altitude.

**Visibility:** Is measured by estimating how much of the horizon can be seen.

**Wave Direction:** measured visually from the direction the wave comes

**Wave Height:** The vertical distance between trough (bottom of the wave) and crest (top of the wave) and is usually measured in feet

**Swell Direction/ Height:** Measured visually usually in feet.



An anemometer, which measures wind speed



Crewmember John Adams uses on-board weather instruments to record hourly weather readings that are then sent to National Weather Service.

### Personal Log

I have enjoyed my time on the bridge of the *Miller Freeman* immensely. I have a better understanding of the weather instruments used onboard and am getting better at spotting whales and identifying birds.

I want to thank the entire NOAA Corps Officers who have taught me so much about how navigation and weather work aboard the *Miller Freeman*.

### **Question of the Day**

Is earth's magnetic north shifting daily?

### **New Term/Phrase/Words**

*Wave*: is created by friction between wind and fluid surface.

*Swell*: wind waves that have traveled from away from where they were generated.

### **Did You Know?**

Magnetic north: the current magnetic north is located in Artic Islands, Canada.

### **Animals Seen Today**

Hake

Humpback whales



**Heather Moes, NOAA Corps officer, stands watch on the bridge of the *Miller Freeman*.**