NOAA Teacher at Sea
Sue White
Onboard NOAA Ship DAVID STARR JORDAN
May 27 – June 7, 2008

NOAA Teacher at Sea: Sue White
NOAA Ship DAVID STARR JORDAN
Mission: Juvenile Rockfish Assessment
Date: Monday, May 26, 2008
Geographical area of cruise: Central Coast of California

Weather Data from the Bridge for Mon. 05-26-08 19:00 GMT (12:00 noon)

Latitude	32.65
Longitude	-117.30
Speed	8.50 kts
Course	303.00
Wind Speed	13.98 kts
Wind Direction	286.40 º
Surface Water Temperature	17.34 ºC
Surface Water Salinity	33.49 PSU
Air Temperature	15.30 ºC
Relative Humidity	71.00 %
Barometric Pressure	1016.30 mb

Science and Technology Log
The DAVID STARR JORDAN (DSJ) departed from San Diego, CA this morning to begin Leg 3 of the Juvenile Rockfish Survey research cruise. The seas have been rough and Leg 2 of this cruise was cut short because of the weather conditions. Since weather has been such a huge influence in the last few weeks in this area of the Pacific and led to a loss of days at sea for the research scientists, here is some background for understanding the abbreviations and terms found in the "**Weather Data from the Bridge**" section above:

GMT = Greenwich Mean Time, international time which is the basis of time in each time zone around the world. Greenwich, England is located at Longitude 0° 0' 0", Latitude 51° 28' 38"N (North of the Equator) or where the east meets the west. The DSJ is on Pacific Time which is 7 hours earlier.

Latitude is the distance the DSJ is north of the equator, expressed in degrees (or hours), minutes, and seconds.

Longitude is the distance the DSJ is west of the prime meridian which runs through Greenwich, England, expressed in degrees (or hours), minutes, and seconds.

(Ship) Speed / Wind Speed refers to how fast the ship is moving or how fast the wind is blowing. Speeds on water or in the air are measured in knots (kts). One knot is one nautical mile per hour. A nautical mile (6076 feet) is a little longer than a mile here on land (5280 feet). Use this conversion factor to change speed in the weather data to speeds on land: 1 knot = 1.16 mph.

Here is a fun visual that connects wind speed in knots to our more familiar miles per hour. It also gives a more qualitative description of what different wind speeds are like. http://www.howtoons.com/toon/the-beaufort-scale

(Ship's) Course refers to the direction the ship is traveling to and is based on a 360° compass.

Wind Direction refers to the direction the wind is coming from. It is also based on a 360° compass.

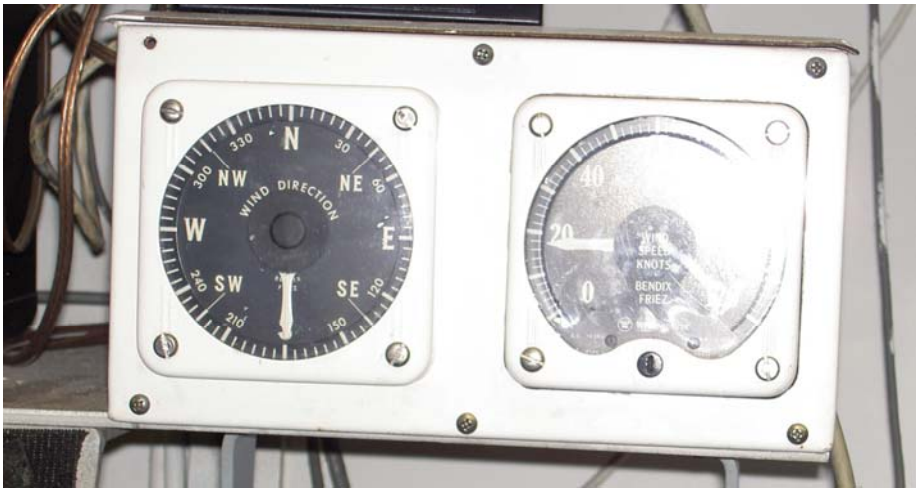

Figure 1. The wet lab's wind direction and wind speed instrumentation. Original to when the ship was built in the 1960's??

°C = degree Celsius

- The conversion factor to change metric temperature to our more familiar Fahrenheit scale is: **[(°C X 9) / 5] + 32 = °F**
- An easy way to estimate, that you can do in your head, is to take °C and multiply it by 2 and then add 30 to get approximate °F: **(°C X 2) + 30 = *approx.* °F**
- Want to do it the other way? Take your temperature at home, subtract 30 and divide by 2 to get the temperature in degree Celsius: **(°F – 30) / 2 = *approx.* °C**

Surface Water Salinity simply stated, describes how salty the ocean water is at the surface and can be referred to in **PSU**s (Practical Salinity Units). It is based on the understanding that the electrical conductivity of seawater is related to its salinity. A special conductivity meter is used at sea and the PSU value is calculated from the data. PSU is not a unit of measurement, but a calculated value. The average world ocean salinity is around 35 PSU.

Relative Humidity is a measure of the amount of water in the air compared with the amount of water the air can hold at the temperature it happens to be when you measure it. At the temperature given in the weather data above, the air has 71% of the moisture it can hold. If the temperature decreases while the number of molecules of water is the same, then the relative

humidity would increase. The cooler air molecules are closer together and cannot hold as much water between them.

Barometric Pressure is the force the atmosphere is exerting on a given place, measured by an instrument called a barometer. Think of it as being the "weight of air". Air pressure is recorded onboard using the unit mb, which stands for millibar. A millibar is $1/1000^{th}$ of a bar. A bar is a force equal to 100,000 Newtons pressing on a square meter. You can feel the change in pressure in your ears when you are flying in an airplane. High pressure usually means good weather and dropping pressure means the weather is changing. Low pressure often brings precipitation.

After being in port since Friday, the ship officers and crew are busy with a flurry of preparation to be at sea again. Bags of groceries were brought aboard this morning while a steady stream of people came aboard too. The ship went from being asleep to bustling in a matter of hours. Engines were started and soot flakes billowed. Deck crew began the tasks of taking up the walkway and casting off. Ship officers were stationed on the port side (left hand side if you are facing towards the front of the ship) to report ship positions as we began to move away from the pier. We headed out to sea, passing what looked like a series of empty boat slips. As we got closer I could see dolphins there and trainers were putting them through their paces. The ship's electronics technician, Kim Belveal (U.S.Navy, ret.), explained that this was a Navy training facility and the dolphins were trained to do very specific tasks, often tasks that reduced risk to people. We passed a Coast Guard ship truly under sail, rigged with huge sails. The lead fisherman, Jose' Coito, has a son who is in the Coast Guard. He proudly told about his son's training on that grand ship.

Figure 2. Vlad and Sam prepare to lift our link to land.

Personal Log

It has been a whirlwind time in the last week for me. I gave my last final exam for the school year on Friday morning, wrapped up the last details for school that afternoon, and headed home to pack. Since the last leg of the cruise was cut short, my travel plans changed within the last few days as well, meaning that I was going to be a NOAA Teacher at Sea one day earlier than planned and flying to a new destination as well. I flew to San Diego on Sunday and got to the ship Sunday evening. After settling into my stateroom, I felt a little like Goldilocks walking around the ship and making myself at home. It was very quiet, but eventually I met the ship's electronics technician and Sam Brandal, an able fisherman, who had also just arrived on the

DAVID STARR JORDAN to fill in for someone on vacation. It has been nice to have some down time to make the transition from school to my time as a Teacher at Sea. I spent today on the fly bridge with my binoculars. Chico Gomez, the chief bosun (also spelled boatswain), and Jose' helped me spot whales on the horizon. I also saw seals and dolphins closer in to the ship. Sea jellies which ranged in size from about 2" to 10" floated by from time to time.

Work starts tomorrow when we pick up the scientists at Avila and do the first transect schedule for this leg of the cruise at Point Sal, CA . . .

Challenge Yourself
Can you compile your own weather data from your home or school? Use measuring instruments you already have, or research in your local newspaper or online. Fill in the table below, converting your data to match the units and values from the DAVID STARR JORDAN bridge:

Weather Data from Home for _____ ____:____ GMT	
Latitude	_____
Longitude	_____
Wind Speed	_____kts
Wind Direction	_____
Air Temperature	_____^{o}C
Relative Humidity	_____%
Barometric Pressure	_____mb

Here's a quote from Rachel Carson that pretty much sums up what it's like to look off the side of the ship:

"We can only sense that in the deep and turbulent recesses of the sea are hidden mysteries far greater than any we have solved."
What mysteries will I see?

Sue