# NOAA Teacher at Sea
# Brett Hoyt
# Onboard NOAA Ship RONALD H. BROWN
# October 8 – October 28, 2006

**NOAA Teacher at Sea:** Brett Hoyt
**NOAA Ship:** Ronald H. Brown
**Mission:** Recovery of Stratus 6 mooring and deployment of Stratus 7 mooring
Recovery of SHOA tsunami warning buoy and deploy a fresh replacement buoy
**Days: Saturday & Sunday, October 21 & 22, 2006**

**Day: Saturday, October 21, 2006**
**Weather Data from Bridge**
Visibility: 12nm (nautical miles)
Wind direction: 160º True
Wind speed: 16 knots
Sea wave height: 4-5ft
Swell wave height: 5-7 ft
Sea level pressure: 1017.7millibars
Sea temperature: 18.4ºC or 65 ºF
Air temperature: 19.0ºC or 66ºF
Cloud type: cumulus, stratocumulus

**Day: Sunday, October 22, 2006**
**Weather Data from Bridge**
Visibility: 12nm (nautical miles)
Wind direction: 130º True
Wind speed: 19 knots
Sea wave height: 4-6ft
Swell wave height: 5-7 ft
Sea level pressure: 1019.7millibars
Sea temperature: 17.3ºC or 63ºF
Air temperature: 18.0ºC or 64ºF
Cloud type: cumulus, stratocumulus, and stratus

**Note:**
All day on the 21st was spent traveling to the Chilean tsunami buoy approximately 300 miles off the coast of Chile. During this time, the Woods Hole group was busy retrieving data from their instruments from Stratus 6. Many of the instruments collect data all year long and store it on flash memory cards. When recovered one year later, this data is then downloaded onto computers for later analysis.

We arrived late in the day on October 22 at the tsunami site and immediately started the process of recovering the old buoy. As you can see, scientists work day and night to get

the job done.  I really have never seen a group of harder working people.

**The Scientists**

**Jeff Lord using an acoustic transmitter/receiver to talk to the acoustic release.  This machine also tells the scientists the range (how far away) to the release that helps them in finding it.**

**Jorge Araya (Chester) and Alvaro Vera, members of the Chilean Navy, looking for the yellow glass balls which were released over an hour ago and take that long to reach the surface.  Work vests were required but not hard hats for this part of the operation.  Both have over 12 years with the Chilean Navy.**

**The Machine:**

The glass balls are attached to the Bottom Pressure Recorder, or BPR, and float to the surface leaving the anchor on the bottom of the ocean.

**Jorge Gaete, a civilian contractor for the Chilean Navy for the past 2 years, helps with the deployment of the tsunami buoy.**

**Capturing the yellow flotation balls that have brought the BPR to the surface for recovery.**

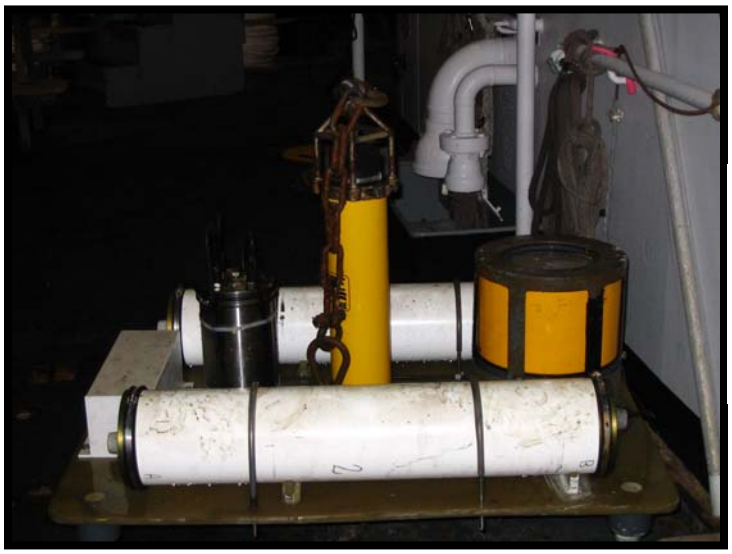
The second part of the tsunami warning system is the recovery of the buoy. This buoy receives the signal from the BPR and quickly transmits the warning via satellite to the Chilean authorities who in turn warn the public. This recovery was done at night. Without the vast array of sensors found on the Stratus 7 buoy, this recovery progressed quickly and was completed within 30 minutes.

**Hooking lines to the tsunami buoy for a quick recovery.**

**The Experiment:**

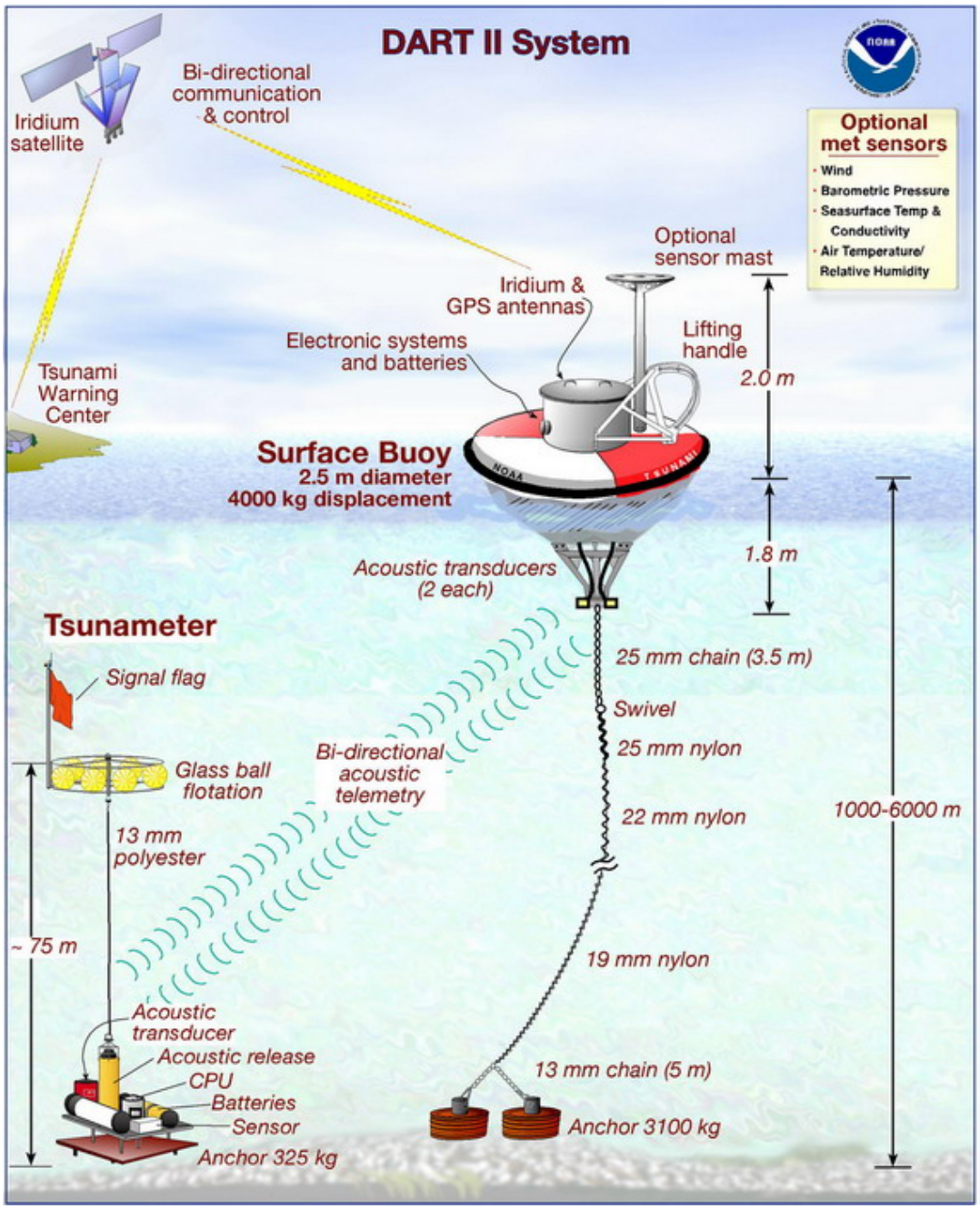
There is no experiment today; however, I will try to explain how the system works.

When a tsunami is triggered by an underwater earthquake the BPR detects the increase in pressure on the bottom of the ocean due to the increase in the height of the water column above the sensor. When I asked Alvaro how this worked when sea swell was 6-7 ft at times and waves could reach a height of 45ft he explained that the pressure is sharp and abrupt. This is indicated by a very short wave (period) of energy passing through the open ocean. In open ocean the height of a huge tsunami wave is so short a ship would hardly know one has passed by. It is only when this wave heads into shallow water that the wave becomes deadly.



**The BPR immediately after recovery, without its anchor that remains on the bottom of the ocean.**

**Classroom Activities:**
Please share with your students the DART tsunami warning system.




My next log will cover the deployment of a new warning system.