Cruise: Trehu- W0907B
Vessel: R/V Wecoma
Port: Yaquina Bay, Newport, Oregon
Captain: Rick Verlini
Chief Scientist: Anne Trehu, OSU-COAS
SIO Personnel: Phil Thai, Paul Georgief, and Ernest Aaron
OSU Watch Standers: Mark Williams, Scott Ureel, and Peter Kannberg
SIO SGG: Lee Ellett and Brandy Murphy
Wecoma Marine Tech: Paul Walczak
Cruise Dates: (07/14/09 – 07/20/09)

R/V WECOMA

I. Summary of OBS Activities

In support of the Trehu Cruise W0907A, we made 2 total deployments of short period ocean bottom seismometers (OBS) off the coast of southern Oregon to compliment the 15 OBS already deployed. These 2 OBS were outfitted with decoupled L28 geophones. Our research vessel was the R/V Wecoma. The seismometers included 14 short period L28s, and 3 long period T240s. The two recently deployed OBS were test instruments deployed to compare data differences between coupled and decoupled geophone seismometer packages. All OBS Instrumentation was developed at Scripps Institution of Oceanography, OBSIP (FIG-1 & FIG-2).

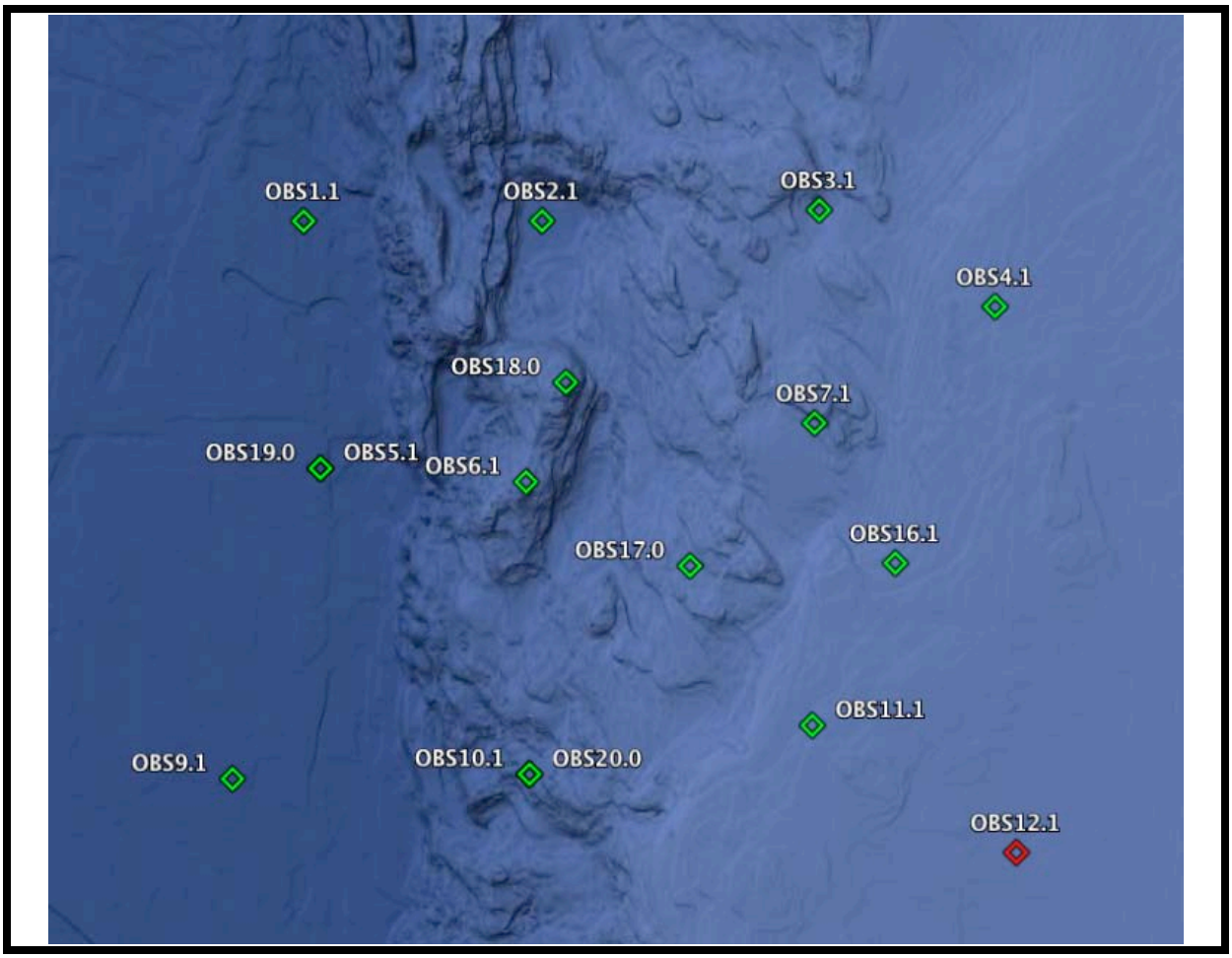
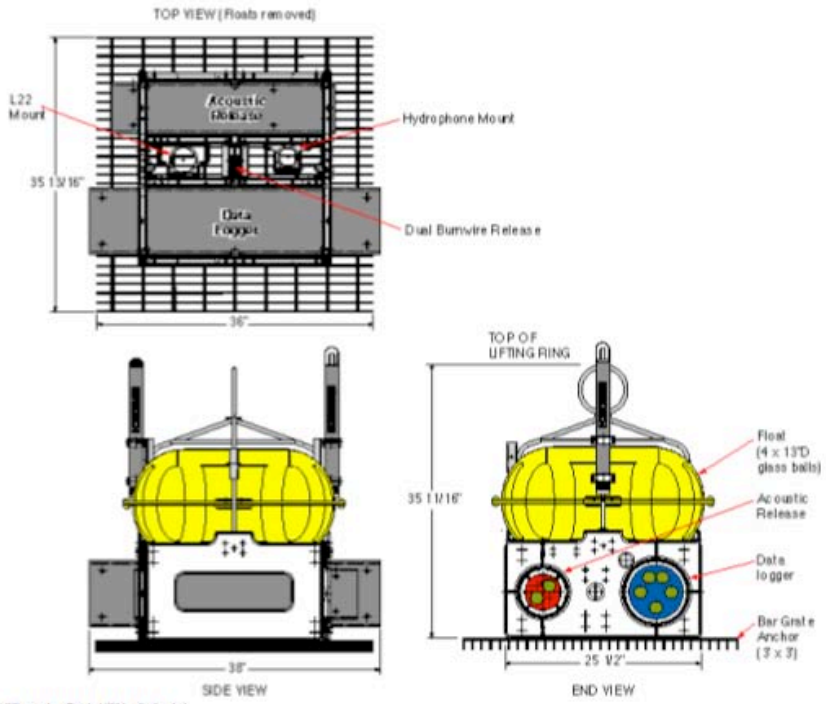


FIG-1: Locations and descriptions of OBS deploy sites (2008).

II. Instrumentation

Scripps OBS



Hydrophone: High Tech® HTI-90-U
Geophone: Mark L28 3-component geophone
Data Logger: L-Cheapo 2000 (LC2000)

SIO LC4X4

The Institute of Geophysics and Planetary Physics at Scripps Institution of Oceanography (IGPP/SIO) in conjunction with the Ocean Bottom Seismology Instrument Pool (OBSIP) provided all instrumentatin for this experiment. The sensors on the short period LC4X4s are an L28 gimbaled 3-component geophone, and a hydrophone. Each instrument is comprised of a 100-pound anchor, a four ball McLane glass float assembly on which the lifting bail is attached, two syntactic foam blocks are added for additional floatation to aid positive buoyancy, and a polyethylene frame holding the sensors, an acoustic release transponder, a 4X4 data logger, and a mechanical release system.

SP 4X4

The short period OBS, the float and frame components are stored separately in a custom rack system, and are assembled and tested prior to deployment on a square preparation platform, which is bolted to the deck. The complete instrument weighs approximately 300 pounds in air. The anchor is a 100-pound iron grate held to the base of the poly frame by a single 2” oval quick-link when the release mechanism is cocked and secured. After the anchor is released for recovery, the four 12” glass balls in the float package, as well as the syntactic

foam blocks provide sufficient buoyancy to lift the instrument at about 43 m/min to the sea surface. To increase visibility at the surface, an orange flag on a 48" fiberglass-resin staff is attached to the floats. The recovery aids also include a Novatech low-pressure activated strobe beacon and radio, which operates at 160.725 MHz.

The acoustic release transponder developed in conjunction with ORE/EdgeTech is comprised of a main circuit board, a SIO developed battery array, and an ITC-3013 transducer manufactured by International Transducer Corp. These are all installed in and on a 4-5/8" aluminum pressure case. All SIO transponders interrogate at 11kHz and respond at 13kHz. Alkaline batteries provide 18 volts power for the burn, 12 volts power for the transponder, and 9 volts power for the circuit board logic. The release mechanism includes two double wire burn elements. When fresh, two battery strings are combined to provide the 18 volts to burn one of two release wires in an average of 6 minutes for water depths encountered during this experiment.

III. Areas of Concern
None.

IV. Ships Equipment and Condition
Excellent. The addition of the articulated crane has made the recovery and deployment efforts routine. Also, there is ample deck space & dry storage.

The crew has all been professional, helpful and accommodating.

V. Journal of Events in Chronological Order
Local Time is Oregon - USA
All times and dates in this report are local unless otherwise noted.

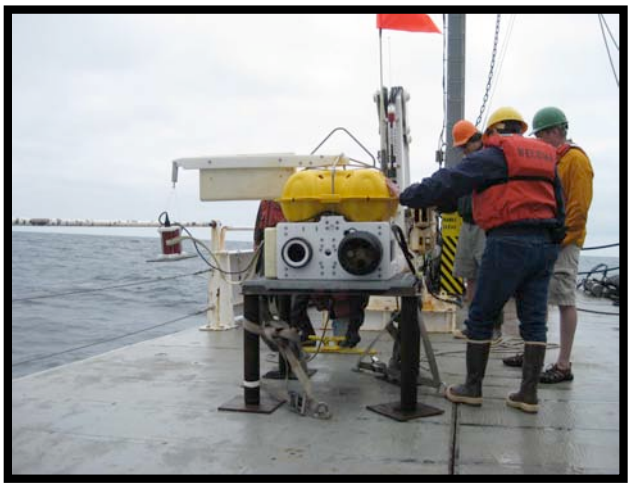
1. Loading
07/13/08 08:00
Our gear was promptly loaded onto the R/V Wecoma at the Yaquina OSU marine facility. Setup of the lab was routine. We had difficulty getting the GPS clocks to lock, but after moving the antenna around one finally locked in.

07/14/08 10:00
We departed the OSU Marine Facility and are anticipating an approximate 8-hour transit to the first of two test deployment sites. These will be sites 19 and 20.

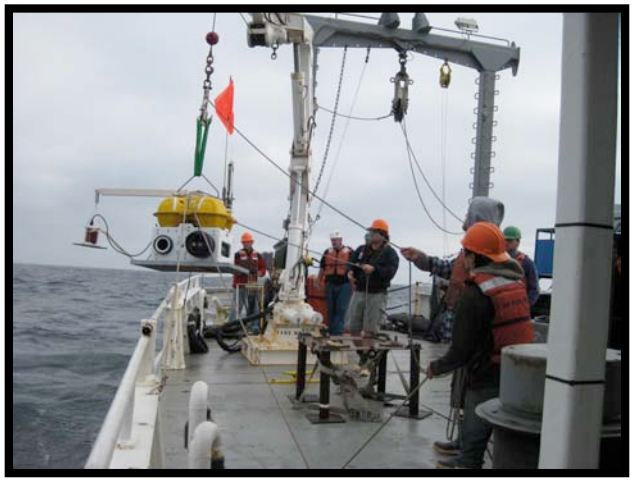
2. Rosette Test
Not required

3. OBS Deployments

Site OBS19.0 (Decoupled L28) 2913M, 3CH/100Hz
07/14/09
It was a simple setup and smooth deployment.



Site OBS20.0 (Decoupled L28) 1328M, 3CH/100Hz
07/14/09
It was another smooth deployment.



The mistake I made with this OBS was forgetting to bolt the syntactic foam onto it. This won't be an issue with floatation, but it makes the two packages a little different. Hopefully we see the same trend in data between the two.

Both OBS balanced very well during the deployment.

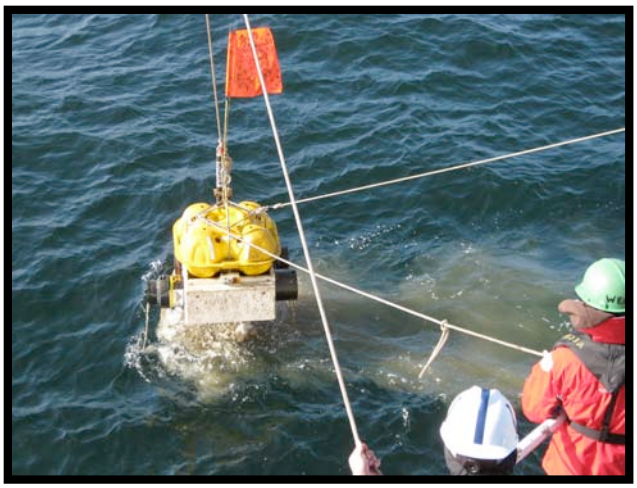
4. OBS Recoveries

Site OBS9.1 (LP) 3000M
07/15/09
Smooth recovery. Radio was stuck off until instrument was next to ship.

Site OBS14.1 (LP) 1534M
07/15/09
Smooth recovery. The flag was broken off during deployment last year and it was very difficult to see the OBS from the working deck.

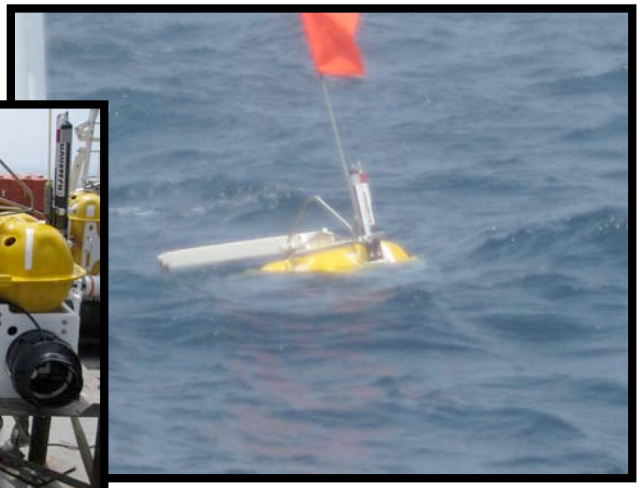
Site OBS15.1 (SP) 124M
07/16/09
It was a successful recovery.

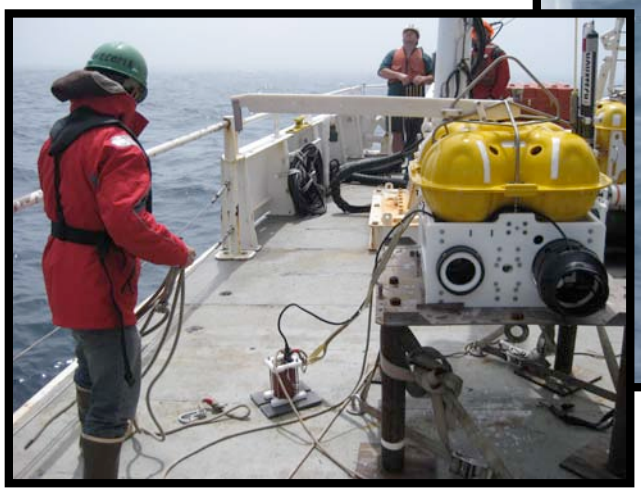
There was a lot of mud streaming from the OBS as well as an abundance of bio-growth. Also, there is a lot of corrosion on the SS hardware to be addressed back at the lab.



Site OBS10.1 (SP) 1323M
07/16/09
It was another successful recovery.

Site OBS20.0, Decoupled L28 (SP) 1323M
07/16/09
It was another successful recovery.





Site OBS4.1, (SP) 150M
07/17/09
It was another successful recovery.

This instrument had significant bio-growth and the L28 connector (90deg) was rubbed enough to create a minor divot in the rubber.

The cables contact with the float top is a factor of the L28 being installed 180deg incorrectly, but the rub mark indicates a constant movement of the float top, which caused a polishing effect.

Site OBS7.1, L28 (SP) 276M
07/17/09
It was another successful recovery.

This OBS (Logger #33) had an issue with the electronics. I'm not sure if there is any useable data.

Site OBS16.1, L28 (SP) 167M
07/17/09
It was another successful recovery.
The weather has been very nice thus far.

Site OBS17.0, L28 (SP) 550M
07/17/09
It was another successful recovery.

Site OBS15.0, L28 (SP) 2712M
07/17/09
It was another successful recovery.

Site OBS19.0, Decoupled L28 (SP) 2712M
07/17/09
It was another successful recovery.

Site OBS2.1, (LP) 1850M
07/17/09
It was another successful recovery.

Site OBS1.1, L28 (SP) 2652M
07/17/09
It was another successful recovery.
Logger #50 had a little moisture inside it. All electronics appear to be ok. Data was intact.

Site OBS18.0, (SP) 590M
07/18/09
It was another successful recovery.
This obs was deployed on an active gas hydrate ridge. It came back as clean as the test obs that were deployed for a few days.

Site OBS6.1, (SP) 740M
07/18/09
It was another successful recovery.
The Logger had a continuous power-reset issue. No Data.

Site OBS6.1, (SP) 523M
07/20/09
It was another successful recovery.

5. Cruise Summary:

This was a textbook example of teamwork. Ships crew, chief science personnel, and OBS science party members all communicated and worked well together throughout the deployment and recovery process. Thanks to favorable weather conditions and a well-managed cruise plan, we were able to safely complete the recovery efforts on schedule.