

Cruise Report

R/V Oceanus - OC1407B

Cascadia Initiative - Leg 5 2014

July 24 - August 5, 2014

Newport, OR - Newport, OR

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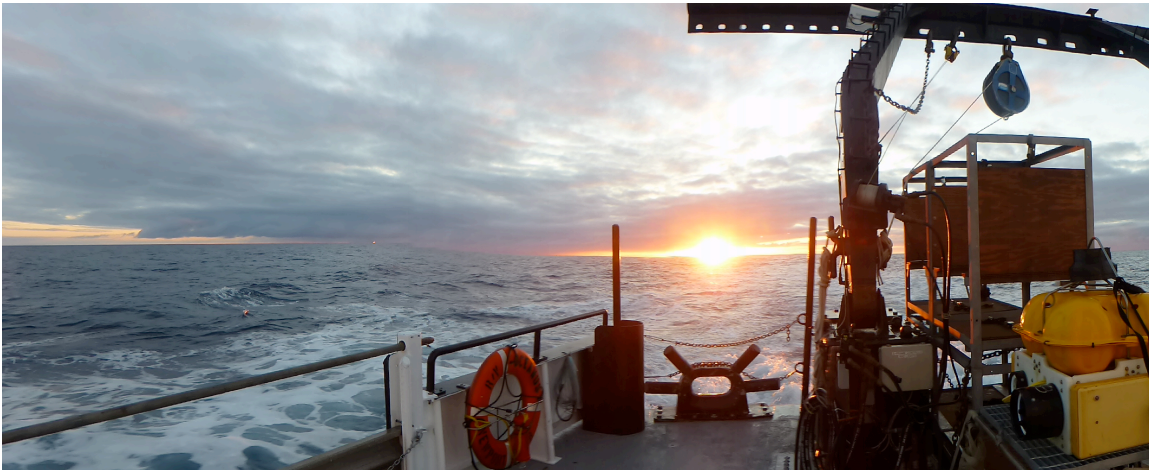


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Cruise Objectives and Assessment

Background. As part of the 2009 American Recovery and Reinvestment Act (ARRA), NSF's Earth Sciences (EAR) and Ocean Sciences (OCE) divisions each received \$5M toward facilities that support EarthScope and GeoPRISMS science objectives with an initial emphasis on onshore/offshore studies of the Cascadia margin. ARRA funds have been used by UNAVCO (University NAVSTAR Consortium), IRIS (Incorporated Research Institutions for Seismology), and OBSIP (Ocean Bottom Seismograph Instrument Pool) to improve real-time GPS capabilities, densify onshore seismic networks, and construct and deploy 60 ocean-bottom seismographs (OBS).

The Cascadia Initiative (CI) is an onshore/offshore seismic and geodetic experiment to study the megathrust, its potential for large earthquakes and the formation, deformation and hydration of the Juan de Fuca and Gorda plates. Articles in the GeoPRISMS Newsletter¹ and Oceanography Magazine² describe CI scientific objectives, offshore deployment plans developed at an open community workshop, and formation of the Cascadia Initiative Expedition Team (CIET). Over its planned 4-year data acquisition period, the CI offshore portion will involve deployment and recovery of about 280 OBSs at about 160 sites and a total of about 25 cruises.

Cruise Objectives: The objective of the cruise was to recover 33 and to deploy 28 3-component OBS from the OBSIP along the Blanco Transform Fault Zone and within the Gorda plate region in the Northeast Pacific. Locations are listed in Tables 1 and 2 and are shown on Figure 1.

Recovery included 15 broadband (SIO-LP: 12 Trillium 240s and 3 Trillium 40s sensors) and 18 short-period instruments from the Scripps Institution of Oceanography (SIO) Institutional Instrument Center (IIC) pool. Each instrument is equipped with a differential pressure gauge. Instruments had been deployed during legs 1 and 2 of the September–November 2013 OC1309B cruise.

Deployment consisted of 28 broadband and short-period instruments from SIO. The broadband instruments are equipped with Nanometrics seismic sensors (SIO-LP: 14 Trillium 240s; SIO-Abalone: 5 Trillium-Compact 40s sensors). 10 LP instruments have regular '4x4 loggers' with standard SIO configuration and gain 0.102. 4 LP instruments have 'new data' loggers with gain 1; they have higher power consumption and will run out of power about 20 days before other LP instruments. These sites are marked in the *Cruise Narrative* as 'new datalogger'. The 9 short-period instruments are equipped with Mark-L28 tri-axial geophones. All instruments include a differential pressure gauge. For

¹McGuire et al., 2011, Cascadia Initiative Workshop Update, GeoPRISMS Newsletter, 26, <http://www.geoprisms.org/newsletters/42-newsletter-articles/scd/cascadia/258-cascadia-update-s2011.html>

²Toomey et al., 2014, The Cascadia Initiative: A Sea Change In Seismological Studies of Subduction Zones, *Oceanography* 27(2):138–150, <http://dx.doi.org/10.5670/oceanog.2014.49>

SIO-LP and short-period instruments, all channels are sampled at 100 Hz; SIO-Abalones are sampled at 50 Hz for consistency with earlier CI deployments.

The original plan for this cruise called for 8 Abalone and 6 SP instruments. However, complete battery packs for only 5 Abalones had arrived on the day of departure and we decided to add 3 SP instruments. These 3 SP instruments were deployed at their originally planned sites (no swapping of instrument type at a given site, instrument distribution remains as planned). This was possible due to the proximity of deployments and recoveries for cruises OC1407B and OC1408A. We had to make slight adjustments to our route, which did not add significant sailing time (less than 6 hrs).

The original cruise plan called for recovery of 30 instruments. Towards the end of the cruise it became clear that we would finish too late on Monday (08/04/2014) to get back to Newport considering tides and captain Crews arranged a Tuesday morning arrival. We decided to add 3 short period retrievals (planned originally for OC1408A) to use the time efficiently and adding contingency time to OC1408A. Sites are GS140, GS090, GS020.

Station names follow CIET naming scheme when reoccupying CIET sites (4 letter site names ending in D; D signifies year-4 deployment) and Nabelek/Braunmiller OC1309B conventions for other sites (5 letter site names [B|G][B|S]xxx, xxx: number; last digit 1 indicates reoccupation of 2013 deployment site).

The OBS deployments were free-fall. The Oceanus remained on station until the OBS reached the seafloor followed by an acoustic survey to determine OBS position on the seafloor. Duration of free-fall and acoustic survey depend on water depth; for deployment depths encountered, duration was about 2 hours. Instruments are deployed for one-year.

We left Newport on July 24 and reached the first OBS deployment site early in the next morning. Until recovery of the last OBS in the evening of August 4 operations took place 24/7 continuously. The deployment/recovery area was 40°-45°N and 131°-125°W. Calm seas during the first week made work on deck easy and by the time the wind and seas got rougher (20-30 knots sustained winds and whitecaps) for the remainder of the cruise we were well acclimatized. The only delay (of about 1 hour) occurred due to a loss of anchor during one deployment. All operations went smoothly and were performed in, what we think, a safe manner. We deployed and recovered all OBS as planned. Communications between the science lab, bridge and crew worked well.

The deployment zone is of U.S. national security relevance and OBS data are of interest to the U.S. Navy. A U.S. Navy – NSF memorandum of agreement for Ocean Observing System Security addresses the at-sea recovery and control of data collected from the OBSIP OBS. All recovered OBS sites were selected for data screening, which means initially only data below 3 Hz are available to scientists and, after completed screening, all data except for retracted time windows will become available (with 90 days of the cruise). SIO personnel recovered the data and Byron Scott from Leidos (Navy contractor performing data screening) applied a low-pass filter to all high-sampling rate channels (more than 6 samples per second) on ship. At the end of the cruise, we obtained all low-pass filtered data for screened sites from Byron Scott (Leidos).

OC1407B Science Party

Chief Scientist John Nabelek (Oregon State University)

Co-Chief Scientist Jochen Braunmiller (University of South Florida)

OSU graduate student Birat Sapkota

OSU undergraduate student Michelle Currie

USF graduate student Heather McFarlin

Apply-to-Sail student Sara Szwaja (University of Rhode Island)

Apply-to-Sail student Lingling Ye (UC Santa Cruz)

OBSIP SIO Ernest Aaron

OBSIP SIO Martin Rapa

OBSIP SIO Paul Georgief

Navy/Leidos Byron Scott

OSU Marine Technician Johna Winters

Marine Technician Intern Nikiforos Delatolas

OC1407B Crew

Captain Jeff Crews

Chief Engineer Ray 'Chip' Millard

Chief Mate Ron Short

Second Mate Tony Monacondilos

Bos'n Doug Beck

A/E Patrick Breshears

A/E Marc Simpson

Engineer Jay Jean-Bart

Engineer David Dean

Chief Steward Joy DeRosa

Steward Sean Guss

Cruise Narrative

July 23, 2014 (Wednesday)

Scripps Institution of Oceanography (SIO) OBSIP group loads instruments and sets up their lab in the main lab of the Oceanus. Battery packs for Abalones have not yet arrived in Newport; ETA: 24 July 8:00-12:00. Abalones sit on dock since battery packs have to be loaded on land.

July 24, 2014 (Thursday)

Safety drill at 10:00 for science crew led by Marine Tech Johna Winters. Newcomers (and some others) try on a survival suit followed by a ship etiquette and procedures run-through by Captain Jeff Crews and Bos'n Doug Beck. Short science pre-cruise meeting on bridge at 10:30 to discuss deployment plan.

Only 5 Abalone battery packs are delivered at 11:00. Instead of 8 Abalones as originally planned to deploy, we can only load these 5. We chose to add 3 more short-period SP instruments, originally planned for deployment on the immediately following cruise OC1408A, but ready now, to compensate for the time gained on this cruise (but added to OC1408A). Instead of changing the type of instrument to be deployed at a site (e.g., swapping an Abalone by a SP instrument), we plan to deploy the 3 SP instruments at their planned locations in the Gorda plate region, which should add only little to the cruise time because the cruise tracks for OC1407B and OC1408A are close by. We are working on details of this change in tracks to relay it to the bridge asap even though this will only affect latter parts of the cruise.

We depart at about 12:50 PDT, after finishing putting batteries in Abalones and loading 5 Abalones and another rack of 3 SP instruments onto the ship.

July 25, 2014 (Friday)

Reached first deploy site J20D at about 0:35 (PDT; DoY 206 07:35 UTC). Deploy SIO Abalone.

Station J20D - Deployment

On Site:	07:35 206 2014 (UTC)
OBS Type:	SIO Abalone Trillium Compact 40s
Launch Time:	07:54 206 2014
Launch Position, Depth:	44° 21.6131' N, 127° 06.5105' W, 2937 m
OBS on Seafloor:	08:45 206 2014

OBS Fall: 58 m/min
 Start Acoustic Survey: 08:45 206 2014
 Disable Acoustic Release: 09:31 206 2014
 Depart, Time on Station: 09:31 206 2014 1 hrs 56 min
 Deployed Position, Depth: 44° 21.6219' N, 127° 06.5122' W, 2936 m

We performed the 'rosette test' for acoustic releases for the SIO short-period and broadband instruments starting at 10:00 (UTC). The test was performed within the slightly deeper Cascadia Channel to allow lowering the releases to 3000 m water depth. Communication was attempted to each of the 25 releases (24 sites plus one spar). Tests were successfully completed and we move to next site.

Station BB830 - Deployment

On Site: 15:37 206 2014 (UTC)
 OBS Type: SIO LP Trillium 240s
 Launch Time: 15:49 206 2014
 Launch Position, Depth: 44° 01.504' N, 127° 37.980' W, 2939 m
 OBS on Seafloor: 17:05 206 2014
 OBS Fall: 39 m/min
 Start Acoustic Survey: 17:05 206 2014
 Disable Acoustic Release: 17:52 206 2014
 Depart, Time on Station: 17:52 206 2014 2 hrs 15 min
 Deployed Position, Depth: 44° 01.4624' N, 127° 37.8648' W, 2939 m
 Comment: LP instrument with 'new datalogger'

Station BB850 - Deployment

On Site: 20:18 206 2014 (UTC)
 OBS Type: SIO Abalone Trillium Compact 40s
 Launch Time: 21:00 206 2014
 Launch Position, Depth: 44° 32.030' N, 128° 02.857' W, 2877 m
 OBS on Seafloor: 21:56 206 2014
 OBS Fall: 51 m/min
 Start Acoustic Survey: 21:56 206 2014
 Disable Acoustic Release: 22:51 206 2014
 Depart, Time on Station: 22:51 206 2014 2 hrs 33 min
 Deployed Position, Depth: 44° 31.9917' N, 128° 02.7613' W, 2875 m

Station BB700 - Recovery

On Site: 01:50 207 2014 (UTC)
 OBS Type: SIO LP Trillium 240s
 Acoustic Release Time: 01:51 207 2014
 OBS on Surface: 03:37 207 2014

OBS Rise Rate: 27 m/min
OBS on Board: 03:45 207 2014
Depart, Time on Station: 05:06 207 2014 3 hrs 16 min
Comment: No radio; recycle frame for redeploy at next site

July 26, 2014 (Saturday)

Station J23D - Deployment

On Site: 08:16 207 2014 (UTC)
OBS Type: SIO LP Trillium 240s
Launch Time: 08:18 207 2014
Launch Position, Depth: 44° 49.652' N, 129° 40.887' W, 2720 m
OBS on Seafloor: 09:17 207 2014
OBS Fall: 46 m/min
Start Acoustic Survey: 09:23 207 2014
Disable Acoustic Release: 10:02 207 2014
Depart, Time on Station: 10:02 207 2014 1 hrs 46 min
Deployed Position, Depth: 44° 49.6444' N, 129° 40.8307' W, 2726 m
Comment: echo sounder signal not clear, launch position depth possibly off; depth at planned (=deployed) site is 2687 m and depth of 2680 m from acoustic box when instrument reached bottom (ship drifted only slightly off drop position); LP instrument with 'new datalogger'; glass ball

Station BB751 - Deployment

On Site: 14:03 207 2014 (UTC)
OBS Type: SIO LP Trillium 240s
Launch Time: 14:03 207 2014
Launch Position, Depth: 44° 35.385' N, 130° 39.469' W, 2872 m
OBS on Seafloor: 15:24 207 2014
OBS Fall: 35 m/min
Start Acoustic Survey: 15:24 207 2014
Disable Acoustic Release: 16:18 207 2014
Depart, Time on Station: 16:19 207 2014 2 hrs 16 min
Deployed Position, Depth: 44° 35.4163' N, 130° 39.1904' W, 2872 m
Comment: BB751 same location as recovery BB750

Station BB750 - Recovery

On Site: 16:21 207 2014 (UTC)
OBS Type: SIO LP Trillium 240s
Acoustic Release Time: 16:39 207 2014
OBS on Surface: 18:04 207 2014
OBS Rise Rate: 35 m/min

OBS on Board: 18:10 207 2014
Depart, Time on Station: 18:28 207 2014 2 hrs 07 min

Station BB740 - Recovery

On Site: 21:24 207 2014 (UTC)
OBS Type: SIO LP Trillium 240s
Acoustic Release Time: 21:36 207 2014
OBS on Surface: 23:26 207 2014
OBS Rise Rate: 29 m/min
OBS on Board: 23:37 207 2014
Depart, Time on Station: 00:22 208 2014 2 hrs 58 min

Station BB870 - Deployment

On Site: 02:07 208 2014 (UTC)
OBS Type: SIO Abalone Trillium Compact 40s
Launch Time: 02:08 208 2014
Launch Position, Depth: 44° 02.826' N, 130° 06.185' W, 3219 m
OBS on Seafloor: 03:05 208 2014
OBS Fall: 56 m/min
Start Acoustic Survey: 03:05 208 2014
Disable Acoustic Release: 03:55 208 2014
Depart, Time on Station: 03:59 208 2014 1 hrs 52 min
Deployed Position, Depth: 44° 02.7238' N, 130° 06.1075' W, 3219 m

Station BB730 - Recovery

On Site: 05:21 208 2014 (UTC)
OBS Type: SIO LP Trillium 240s
Acoustic Release Time: 05:36 208 2014
OBS on Surface: 07:13 208 2014
OBS Rise Rate: 34 m/min
OBS on Board: 07:22 208 2014
Depart, Time on Station: 07:51 208 2014 2 hrs 30 min
Comment: rearranged instruments to free up deck space,
moved only slowly toward next site for 1 hr

July 27, 2014 (Sunday)

Station BB711 - Deployment

On Site: 11:26 208 2014 (UTC)
OBS Type: SIO LP Trillium 240s
Launch Time: 11:32 208 2014
Launch Position, Depth: 44° 10.279' N, 129° 08.554' W, 2441 m
OBS on Seafloor: 12:34 208 2014

OBS Fall: 39 m/min
Start Acoustic Survey: 12:35 208 2014
Disable Acoustic Release: 13:18 208 2014
Depart, Time on Station: 13:18 208 2014 1 hrs 52 min
Deployed Position, Depth: 44° 10.1017' N, 129° 08.5648' W, 2441 m
Comment: BB711 same location as recovery BB710

Station BB710 - Recovery

On Site: 13:21 208 2014 (UTC)
OBS Type: SIO LP Trillium 40s
Acoustic Release Time: 13:22 208 2014
OBS on Surface: 15:02 208 2014
OBS Rise Rate: 24 m/min
OBS on Board: 15:10 208 2014
Depart, Time on Station: 15:34 208 2014 2 hrs 13 min
Comment: surfaced about 400 m from BB711 drop site

Station BB721 - Deployment

On Site: 17:55 208 2014 (UTC)
OBS Type: SIO LP Trillium 240s
Launch Time: 17:57 208 2014
Launch Position, Depth: 43° 44.977' N, 129° 24.776' W, 3171 m
OBS on Seafloor: 19:15 208 2014
OBS Fall: 41 m/min
Start Acoustic Survey: 19:15 208 2014
Disable Acoustic Release: 20:15 208 2014
Depart, Time on Station: 20:15 208 2014 2 hrs 20 min
Deployed Position, Depth: 43° 44.9969' N, 129° 24.8203' W, 3171 m
Comment: BB 721 same location as recovery BB720

Station BB720 - Recovery

On Site: 20:16 208 2014 (UTC)
OBS Type: SIO LP Trillium 240s
Acoustic Release Time: 21:18 208 2014
OBS on Surface: 23:02 208 2014
OBS Rise Rate: 30 m/min
OBS on Board: 23:25 208 2014
Depart, Time on Station: 23:58 208 2014 3 hrs 42 min
Comment: Resurveyed instrument location because last year's deployment survey had few good returns

Station J06D - Deployment

On Site: 03:30 209 2014 (UTC)

OBS Type: SIO LP Trillium 240s
 Launch Time: 03:31 209 2014
 Launch Position, Depth: 43° 15.154' N, 128° 48.219' W, 3246 m
 OBS on Seafloor: 04:55 208 2014
 OBS Fall: 38 m/min
 Start Acoustic Survey: 04:56 209 2014
 Disable Acoustic Release: 05:44 209 2014
 Depart, Time on Station: 05:55 209 2014 2 hrs 24 min
 Deployed Position, Depth: 43° 15.1561' N, 128° 48.2472' W, 3245 m
 Comment: J06D same location as recovery J06C-BB680

Station J06C-BB680 - Recovery

On Site: 05:55 209 2014 (UTC)
 OBS Type: SIO LP Trillium 240s
 Acoustic Release Time: 07:09 209 2014
 OBS on Surface: 08:23 209 2014
 OBS Rise Rate: 44 m/min
 OBS on Board: 08:30 209 2014
 Depart, Time on Station: 09:07 209 2014 3 hrs 12 min
 Comment: Resurveyed instrument location because last year's deployment survey had few good returns

July 28, 2014 (Monday)

Station BB860 - Deployment

On Site: 12:05 209 2014 (UTC)
 OBS Type: SIO LP Trillium 240s
 Launch Time: 12:33 209 2014
 Launch Position, Depth: 43° 43.972' N, 128° 30.250' W, 2660 m
 OBS on Seafloor: 13:41 209 2014
 OBS Fall: 39 m/min
 Start Acoustic Survey: 13:41 209 2014
 Disable Acoustic Release: 14:26 209 2014
 Depart, Time on Station: 14:30 209 2014 2 hrs 25 min
 Deployed Position, Depth: 43° 43.8489' N, 128° 30.2220' W, 2660 m

Station BB690 - Recovery

On Site: 15:00 209 2014 (UTC)
 OBS Type: SIO LP Trillium 240s
 Acoustic Release Time: 15:12 209 2014
 OBS on Surface: 17:05 209 2014
 OBS Rise Rate: 25 m/min
 OBS on Board: 17:12 209 2014
 Depart, Time on Station: 17:35 209 2014 3 hrs 35 min

Station BB670 - Recovery

On Site: 19:38 209 2014 (UTC)
OBS Type: SIO LP Trillium 40s
Acoustic Release Time: 20:01 209 2014
OBS on Surface: 21:49 209 2014
OBS Rise Rate: 30 m/min
OBS on Board: 22:00 209 2014
Depart, Time on Station: 22:49 209 2014 3 hrs 11 min

Station BB840 - Deployment

On Site: 00:26 210 2014 (UTC)
OBS Type: SIO Abalone Trillium Compact 40s
Launch Time: 00:28 210 2014
Launch Position, Depth: 43° 25.513' N, 128° 01.841' W, 3278 m
OBS on Seafloor: 01:27 210 2014
OBS Fall: 56 m/min
Start Acoustic Survey: 01:28 210 2014
Disable Acoustic Release: 02:31 210 2014
Depart, Time on Station: 02:32 210 2014 2 hrs 06 min
Deployed Position, Depth: 43° 25.5202' N, 128° 02.0039' W, 3278 m

Station BB660 - Recovery

On Site: 03:30 210 2014 (UTC)
OBS Type: SIO LP Trillium 240s
Acoustic Release Time: 03:32 210 2014
OBS on Surface: 04:45 210 2014
OBS Rise Rate: 32 m/min
OBS on Board: 04:56 210 2014
Depart, Time on Station: 05:39 210 2014 2 hrs 09 min

July 29, 2014 (Tuesday)

Station BS820 - Deployment

On Site: 07:21 210 2014 (UTC)
OBS Type: SIO short-period Mark-L28
Launch Time: 07:29 210 2014
Launch Position, Depth: 43° 34.807' N, 127° 21.778' W, 2935 m
OBS on Seafloor: 08:40 210 2014
OBS Fall: 41 m/min
Start Acoustic Survey: 08:40 210 2014
Disable Acoustic Release: 09:30 210 2014
Depart, Time on Station: 09:31 210 2014 2 hrs 16 min

Deployed Position, Depth: 43° 34.7945' N, 127° 21.7105' W, 2935 m

Station BB650 - Recovery

On Site: 10:36 210 2014 (UTC)
OBS Type: SIO LP Trillium 240s
Acoustic Release Time: 10:36 210 2014
OBS on Surface: 12:27 210 2014
OBS Rise Rate: 26 m/min
OBS on Board: 12:48 210 2014
Depart, Time on Station: 13:19 210 2014 2 hrs 43 min

Station BS810 - Deployment

On Site: 15:xx 210 2014 (UTC)
OBS Type: SIO short-period Mark-L28
Launch Time: 15:xx 210 2014
Launch Position, Depth: 43° 13.216' N, 126° 42.636' W, 2940 m
OBS on Seafloor: 16:21 210 2014
OBS Fall: xx m/min
Start Acoustic Survey: 16:21 210 2014
Disable Acoustic Release: 17:12 210 2014
Depart, Time on Station: 17:12 210 2014 about 2 hrs
Deployed Position, Depth: 43° 13.0580' N, 126° 42.5586' W, 2940 m

Station BS620 - Recovery

On Site: 18:07 210 2014 (UTC)
OBS Type: SIO short-period Mark-L28
Acoustic Release Time: 18:23 210 2014
OBS on Surface: 19:17 210 2014
OBS Rise Rate: 55 m/min
OBS on Board: 19:26 210 2014
Depart, Time on Station: 19:32 210 2014 1 hrs 25 min

Station BB630 - Recovery

On Site: 21:30 210 2014 (UTC)
OBS Type: SIO LP Trillium 40s
Acoustic Release Time: 21:54 210 2014
OBS on Surface: 23:20 210 2014
OBS Rise Rate: 39 m/min
OBS on Board: 23:30 210 2014
Depart, Time on Station: 00:10 211 2014 2 hrs 40 min

Station BS641 - Deployment

On Site: 02:58 211 2014 (UTC)
 OBS Type: SIO short-period Mark-L28
 Launch Time: 03:11 211 2014
 Launch Position, Depth: 42° 59.586' N, 127° 18.137' W, 2840 m
 OBS on Seafloor: 04:12 211 2014
 OBS Fall: 47 m/min
 Start Acoustic Survey: 04:16 211 2014
 Disable Acoustic Release: 05:09 211 2014
 Depart, Time on Station: 05:12 211 2014 2 hrs 14 min
 Deployed Position, Depth: 42° 59.6345' N, 127° 18.1223' W, 2840 m
 Comment: BS641 same location as recovery BB640

Station BB640 - Recovery

On Site: 05:12 211 2014 (UTC)
 OBS Type: SIO LP Trillium 240s
 Acoustic Release Time: 05:30 211 2014
 OBS on Surface: 07:17 211 2014
 OBS Rise Rate: 27 m/min
 OBS on Board: 07:36 211 2014
 Depart, Time on Station: 08:08 211 2014 2 hrs 56 min
 Comment: Communication (release and burn command) with instrument took time; strobe not working

July 30, 2014 (Wednesday)

Station G37D-GB061 - Deployment

On Site: 10:08 211 2014 (UTC)
 OBS Type: SIO Abalone Trillium Compact 40s
 Launch Time: 10:20 211 2014
 Launch Position, Depth: 42° 37.719' N, 127° 18.079' W, 2805 m
 OBS on Seafloor: 11:05 211 2014
 OBS Fall: 62 m/min
 Start Acoustic Survey: 11:15 211 2014
 Disable Acoustic Release: 12:15 211 2014
 Depart, Time on Station: 12:15 211 2014 2 hrs 07 min
 Deployed Position, Depth: 42° 37.7097' N, 127° 18.0538' W, 2805 m
 Comment: G37D-GB061 same location as recovery GS060

Station GS060 - Recovery

On Site: 12:15 211 2014 (UTC)
 OBS Type: SIO short-period Mark-L28
 Acoustic Release Time: 12:06 211 2014
 OBS on Surface: 13:12 211 2014

OBS Rise Rate: 43 m/min
OBS on Board: 13:26 211 2014
Depart, Time on Station: 13:53 211 2014 1 hrs 38 min

Station GS120 - Recovery

On Site: 16:19 211 2014 (UTC)
OBS Type: SIO short-period Mark-L28
Acoustic Release Time: 16:20 211 2014
OBS on Surface: 17:30 211 2014
OBS Rise Rate: 40 m/min
OBS on Board: 17:37 211 2014
Depart, Time on Station: 18:11 211 2014 1 hrs 52 min

Station G30D-GB181 - Deployment

On Site: 21:00 211 2014 (UTC)
OBS Type: SIO LP Trillium 240s
Launch Time: 21:31 211 2014
Launch Position, Depth: 41° 57.088' N, 128° 17.769' W, 3179 m
OBS on Seafloor: 22:55 211 2014
OBS Fall: 38 m/min
Start Acoustic Survey: 23:00 211 2014
Disable Acoustic Release: 23:59 211 2014
Depart, Time on Station: 23:59 211 2014 2 hrs 59 min
Deployed Position, Depth: 41° 57.0516' N, 128° 17.8472' W, 3179 m
Comment: G30D-GB181 same loc. as recovery G30C-GB180

Station G30C-GB180 - Recovery

On Site: 00:00 212 2014 (UTC)
OBS Type: SIO LP Trillium 240s
Acoustic Release Time: 00:18 212 2014
OBS on Surface: 01:48 212 2014
OBS Rise Rate: 35 m/min
OBS on Board: 02:02 212 2014
Depart, Time on Station: 02:31 212 2014 2 hrs 31 min

Station GS240 - Recovery

On Site: 05:20 212 2014 (UTC)
OBS Type: SIO short-period Mark-L28
Acoustic Release Time: 05:24 212 2014
OBS on Surface: 06:39 212 2014
OBS Rise Rate: 41 m/min
OBS on Board: 06:46 212 2014
Depart, Time on Station: 07:10 212 2014 1 hrs 50 min

July 31, 2014 (Thursday)

Station GB171 - Deployment

On Site: 09:51 212 2014 (UTC)
OBS Type: SIO LP Trillium 240s
Launch Time: 10:16 212 2014
Launch Position, Depth: 41° 35.805' N, 127° 25.406' W, 3469 m
OBS on Seafloor: 11:35 212 2014
OBS Fall: 44 m/min
Start Acoustic Survey: 11:36 212 2014
Disable Acoustic Release: 12:39 212 2014
Depart, Time on Station: 12:39 212 2014 2 hrs 48 min
Deployed Position, Depth: 41° 35.8212' N, 127° 25.5239' W, 3469 m
Comment: LP instrument with 'new datalogger'

Station GB111 - Deployment

On Site: 14:30 212 2014 (UTC)
OBS Type: SIO LP Trillium 240s
Launch Time: 15:19 212 2014
Launch Position, Depth: 41° 55.370' N, 127° 10.269' W, 3403 m
OBS on Seafloor: 16:36 212 2014
OBS Fall: 44 m/min
Start Acoustic Survey: 16:34 212 2014
Disable Acoustic Release: 17:34 212 2014
Depart, Time on Station: 17:35 212 2014 3 hrs 05 min
Deployed Position, Depth: 41° 55.3043' N, 127° 10.2972' W, 3403 m
Comment: GB111 same location as recovery GS110;
LP instrument with 'new datalogger'

Station GS110 - Recovery

On Site: 17:35 212 2014 (UTC)
OBS Type: SIO short-period Mark-L28
Acoustic Release Time: 17:45 212 2014
OBS on Surface: 19:01 212 2014
OBS Rise Rate: 46 m/min
OBS on Board: 19:07 212 2014
Depart, Time on Station: 19:37 212 2014 2 hrs 02 min

Station GS160 - Recovery

On Site: 22:30 212 2014 (UTC)
OBS Type: SIO short-period Mark-L28
Acoustic Release Time: 22:35 212 2014

OBS on Surface: 23:46 212 2014
OBS Rise Rate: 42 m/min
OBS on Board: 23:54 212 2014
Depart, Time on Station: 00:10 213 2014 1 hrs 40 min

Station GS221 - Deployment

On Site: 02:05 213 2014 (UTC)
OBS Type: SIO short-period Mark-L28
Launch Time: 02:53 213 2014
Launch Position, Depth: 41° 04.621' N, 126° 54.806' W, 3005 m
OBS on Seafloor: 04:23 213 2014
OBS Fall: 33 m/min
Start Acoustic Survey: 04:23 213 2014
Disable Acoustic Release: 05:15 213 2014
Depart, Time on Station: 05:15 213 2014 3 hrs 10 min
Deployed Position, Depth: 41° 04.5605' N, 126° 54.9143' W, 2940 m

August 1, 2014 (Friday)

Station G12D-GB291 - Deployment

On Site: 07:00 213 2014 (UTC)
OBS Type: SIO LP Trillium 240s
Launch Time: 07:19 213 2014
Launch Position, Depth: 40° 46.486' N, 127° 08.187' W, 2884 m
OBS on Seafloor: 08:38 213 2014
OBS Fall: 37 m/min
Start Acoustic Survey: 08:40 213 2014
Disable Acoustic Release: 08:40 213 2014
Depart, Time on Station: 09:32 213 2014 2 hrs 32 min
Deployed Position, Depth: 40° 46.3792' N, 127° 08.1738' W, 2884 m
Comment: G12D-GB291 same location as recovery GS290

Station GS290 - Recovery

On Site: 09:33 213 2014 (UTC)
OBS Type: SIO short-period Mark-L28
Acoustic Release Time: 09:34 213 2014
OBS on Surface: 10:44 213 2014
OBS Rise Rate: 41 m/min
OBS on Board: 10:54 213 2014
Depart, Time on Station: 11:29 213 2014 1 hrs 56 min

Station GB341 - Deployment

On Site: 13:59 213 2014 (UTC)

OBS Type: SIO LP Trillium 240s
Launch Time: 14:26 213 2014
Launch Position, Depth: 40° 22.502' N, 127° 26.462' W, 1791 m
OBS on Seafloor: 15:24 213 2014
OBS Fall: 37 m/min
Start Acoustic Survey: 15:26 213 2014
Disable Acoustic Release: 15:56 213 2014
Depart, Time on Station: 15:57 213 2014 1 hrs 58 min
Deployed Position, Depth: 40° 22.3250' N, 127° 26.5399' W, 1791 m
Comment: Dropped ~100m N of planned DP to account for current

Station GS400 - Recovery

On Site: 17:48 213 2014 (UTC)
OBS Type: SIO short-period Mark-L28
Acoustic Release Time: 17:48 213 2014
OBS on Surface: 19:31 213 2014
OBS Rise Rate: 44 m/min
OBS on Board: 19:40 213 2014
Depart, Time on Station: 19:55 213 2014 2 hrs 07 min

Station GS390 - Recovery

On Site: 00:12 214 2014 (UTC)
OBS Type: SIO short-period Mark-L28
Acoustic Release Time: 00:18 214 2014
OBS on Surface: 01:59 214 2014
OBS Rise Rate: 43 m/min
OBS on Board: 02:15 214 2014
Depart, Time on Station: 02:25 214 2014 2 hrs 13 min

Station G03C-GB380 - Recovery

On Site: 04:52 214 2014 (UTC)
OBS Type: SIO LP Trillium 240s
Acoustic Release Time: 05:02 214 2014
OBS on Surface: 07:33 214 2014
OBS Rise Rate: 27 m/min
OBS on Board: 07:50 214 2014
Depart, Time on Station: 08:16 214 2014 3 hrs 24 min

August 2, 2014 (Saturday)

Station GS370 - Recovery

On Site: 11:55 214 2014 (UTC)

OBS Type: SIO short-period Mark-L28
Acoustic Release Time: 11:57 214 2014
OBS on Surface: 12:28 214 2014
OBS Rise Rate: 56 m/min
OBS on Board: 12:35 214 2014
Depart, Time on Station: 13:13 214 2014 1 hrs 18 min
Comment: strobe not working

Station GS311 - Deployment

On Site: 15:15 214 2014 (UTC)
OBS Type: SIO short-period Mark-L28
Launch Time: 15:23 214 2014
Launch Position, Depth: 40° 27.460' N, 125° 07.929' W, ? m
OBS on Seafloor: 16:28 214 2014
OBS Fall: 38 m/min
Start Acoustic Survey: 16:32 214 2014
Disable Acoustic Release: 17:20 214 2014
Depart, Time on Station: 17:23 214 2014 2 hrs 08 min
Deployed Position, Depth: 40° 27.3252' N, 125° 07.9225' W, 2498 m

Station GB321 - Deployment

On Site: 20:30 214 2014 (UTC)
OBS Type: SIO LP Trillium 240s
Launch Time: 21:02 214 2014
Launch Position, Depth: 40° 23.469' N, 125° 54.661' W, 2284 m
OBS on Seafloor: 22:04 214 2014
OBS Fall: 37 m/min
Start Acoustic Survey: 22:04 214 2014
Disable Acoustic Release: 22:54 214 2014
Depart, Time on Station: 22:55 214 2014 2 hrs 25 min
Deployed Position, Depth: 40° 23.5346' N, 125° 54.6993' W, 2284 m
Comment: Drop point chosen based on last year's drift due to current

Station G11D-GB301 - Deployment

On Site: 02:10 215 2014 (UTC)
OBS Type: SIO LP Trillium 240s
Launch Time: 03:53 215 2014
Launch Position, Depth: 40° 47.188' N, 126° 28.091' W, 3145 m
OBS on Seafloor: 05:11 215 2014
OBS Fall: 40 m/min
Start Acoustic Survey: 05:19 215 2014
Disable Acoustic Release: 06:06 215 2014

Depart, Time on Station: 06:07 215 2014 3 hrs 57 min
Deployed Position, Depth: 40° 47.0708' N, 126° 28.0953' W, 3145 m
Comment: Instrument resurfaced because anchor detached;
recover, rebuild (new anchor, change acoustic),
and relaunch (launch time is for second launch;
G11D-GB301 same location as recovery GS300

Station GS300 - Recovery

On Site: 06:07 215 2014 (UTC)
OBS Type: SIO short-period Mark-L28
Acoustic Release Time: 06:10 215 2014
OBS on Surface: 07:32 215 2014
OBS Rise Rate: 38 m/min
OBS on Board: 07:44 215 2014
Depart, Time on Station: 08:03 215 2014 1 hrs 56 min

August 3, 2014 (Sunday)

Station GS280 - Recovery

On Site: 10:08 215 2014 (UTC)
OBS Type: SIO short-period Mark-L28
Acoustic Release Time: 10:12 215 2014
OBS on Surface: 11:26 215 2014
OBS Rise Rate: 42 m/min
OBS on Board: 11:36 215 2014
Depart, Time on Station: 12:06 215 2014 1 hrs 58 min

Station GS151 - Deployment

On Site: 16:18 215 2014 (UTC)
OBS Type: SIO short-period Mark-L28
Launch Time: 16:33 215 2014
Launch Position, Depth: 41° 41.789' N, 126° 21.634' W, 2964 m
OBS on Seafloor: 17:38 215 2014
OBS Fall: 45 m/min
Start Acoustic Survey: 17:38 215 2014
Disable Acoustic Release: 18:26 215 2014
Depart, Time on Station: 18:26 215 2014 2 hrs 08 min
Deployed Position, Depth: 41° 41.6578' N, 126° 21.5820' W, 2963 m
Comment: GS151 same location as recovery GS150

Station GS150 - Recovery

On Site: 18:27 215 2014 (UTC)

OBS Type: SIO short-period Mark-L28
Acoustic Release Time: 18:30 215 2014
OBS on Surface: 19:43 215 2014
OBS Rise Rate: 41 m/min
OBS on Board: 19:48 215 2014
Depart, Time on Station: 20:23 215 2014 1 hrs 56 min

Station GS141 - Deployment

On Site: 00:07 216 2014 (UTC)
OBS Type: SIO short-period Mark-L28
Launch Time: 00:21 216 2014
Launch Position, Depth: 41° 39.125' N, 125° 33.080' W, 3119 m
OBS on Seafloor: 01:26 216 2014
OBS Fall: 48 m/min
Start Acoustic Survey: 01:26 216 2014
Disable Acoustic Release: 02:25 216 2014
Depart, Time on Station: 02:25 216 2014 2 hrs 18 min
Deployed Position, Depth: 41° 39.2194' N, 125° 33.2908' W, 3119 m
Comment: GS141 same location as recovery GS140

Station GS140 - Recovery

On Site: 02:29 216 2014 (UTC)
OBS Type: SIO short-period Mark-L28
Acoustic Release Time: 02:35 216 2014
OBS on Surface: 03:49 216 2014
OBS Rise Rate: 42 m/min
OBS on Board: 04:01 216 2014
Depart, Time on Station: 04:26 216 2014 1 hrs 57 min
Comment: Strobe did not work

August 4, 2014 (Monday)

Station GS090 - Recovery

On Site: 07:07 216 2014 (UTC)
OBS Type: SIO short-period Mark-L28
Acoustic Release Time: 07:12 216 2014
OBS on Surface: 08:22 216 2014
OBS Rise Rate: 42 m/min
OBS on Board: 08:49 216 2014
Depart, Time on Station: 09:27 216 2014 2 hrs 20 min

Station GS031 - Deployment

On Site: 11:33 216 2014 (UTC)

OBS Type: SIO short-period Mark-L28
Launch Time: 11:49 216 2014
Launch Position, Depth: 42° 21.483' N, 125° 51.390' W, 2625 m
OBS on Seafloor: 12:47 216 2014
OBS Fall: 45 m/min
Start Acoustic Survey: 12:48 216 2014
Disable Acoustic Release: 13:38 216 2014
Depart, Time on Station: 13:38 216 2014 2 hrs 05 min
Deployed Position, Depth: 42° 21.4062' N, 125° 51.6860' W, 2625 m

Station GS040 - Recovery

On Site: 16:01 216 2014 (UTC)
OBS Type: SIO short-period Mark-L28
Acoustic Release Time: 16:05 216 2014
OBS on Surface: 17:22 216 2014
OBS Rise Rate: 37 m/min
OBS on Board: 17:29 216 2014
Depart, Time on Station: 18:00 216 2014 1 hrs 59 min

Station BS611 - Deployment

On Site: 20:12 216 2014 (UTC)
OBS Type: SIO short-period Mark-L28
Launch Time: 20:29 216 2014
Launch Position, Depth: 42° 50.227' N, 126° 00.817' W, 2720 m
OBS on Seafloor: 21:27 216 2014
OBS Fall: 47 m/min
Start Acoustic Survey: 21:27 216 2014
Disable Acoustic Release: 22:16 216 2014
Depart, Time on Station: 22:16 216 2014 2 hrs 04 min
Deployed Position, Depth: 42° 50.2454' N, 126° 00.6969' W, 2720 m
Comment: BS611 same location as recovery BS610

Station BS610 - Recovery

On Site: 22:18 216 2014 (UTC)
OBS Type: SIO short-period Mark-L28
Acoustic Release Time: 22:20 216 2014
OBS on Surface: 23:25 216 2014
OBS Rise Rate: 42 m/min
OBS on Board: 23:33 216 2014
Depart, Time on Station: 23:49 216 2014 1 hrs 31 min

Station GS020 - Recovery

On Site: 02:21 217 2014 (UTC)

OBS Type:	SIO short-period Mark-L28	
Acoustic Release Time:	02:23 217 2014	
OBS on Surface:	03:37 217 2014	
OBS Rise Rate:	42 m/min	
OBS on Board:	03:45 217 2014	
Depart, Time on Station:	04:10 217 2014	1 hrs 49 min

Completed last recovery and heading back to Newport. ETA 10 AM Tuesday.

August 5, 2014 (Tuesday)

Return to Newport at 10 AM.

Note: Deployed positions and depths given are values determined by the OBS IICs at sea. SIO uses an average wave speed of 1500 m/s. Depth is fixed (to depth at launch position) for SIO.

OBS Operations:

The SIO group and the ship's crew worked very efficiently and we were able to finish cruise OC1407B one day ahead of schedule even after adding 3 recoveries that were originally planned for the subsequent cruise OC1408A. Weather conditions, very favorable during the first half of the cruise but rougher for the remainder with 20-30 knots winds, allowed continuous 24/7 operations.

Data Screening

All OBS deployed during last year's OC1309B cruise and recovered during OC1407B are located in areas of importance to U.S. Navy operations. In accordance with the agreement between the U.S. Navy and the National Science Foundation for Ocean Observing System Security data from all recovered OBS are being screened by the Navy to remove security sensitive time periods from recordings. The Navy representative for the cruise is Byron Scott from Leidos. All data are made available to the scientists after 3Hz low-pass filtering. The Navy will screen raw data and security relevant time periods will be redacted from raw data before returning high-sampling rate data to the science party (within 90 days of the cruise).

Data Recovery Notes

1. BB700 seismic channels mis-wired. Channel 1 is vertical, 0 and 2 are horizontals.
2. BB750 seismometer not connected; recorded only digitizer self-noise. DPG is fine.
3. BB690 recorded only ~21 GB of data. Stopped at day 053 (22 February 2014) for 152 days of recording.
4. GS120 recorded only ~4 GB of data. Stopped at day 316 (12 November 2013) for 31 days of recording.
5. GS160 data acquisition was not turned on (not initialized). No data recorded. 0 data.
6. GS290 did not record data (no header and <1 MB data). Reason unknown. 0 data.
7. GS390 flash card cannot be read. 0 data.
8. GS370 flash card cannot be read. 0 data.
9. GS300 channel 1 (one horizontal seismometer component) not working properly.
10. GS140 flash card cannot be read. 0 data.
11. GS040 recorded only ~1.3GB of data (~1 week). Bad power strip.

12. BS610 flash card cannot be read. 0 data.

General notes.

For leg 1 and 2 of the OC1309B deployment, SIO used one 64 GB flash card per site. Storage use for complete sites is on the order of 38-43 GB.

Six batches of flash cards (with different lot numbers) were used. Initially, we discovered faulty cards from one batch (sites where card did not work: GS160, GS290, GS370, GS390; cards from same batch that worked: GS120 (only 4 GB/31 days recorded), GS110, GB380, and GS280). During last few recoveries we encountered faulty cards from a second batch (not working: GS140, BS610; working: BS620, GS040 (bad power strip), GS060, and GS300). A total of 6 cards, out of 33 recovered could not be accessed or were not recording (18%). All of these sites (cards) were deployed during leg 2 of OC1309B. In pre-checkout tests at SIO, cards could be formatted and written to; it is not clear why they failed in the field.

Overall, the high rate of flash card failures (6 sites with 0% data return) is a serious issue with considerable effects on science that can be done with this dataset.

Strobes and Radios for Recovery

Upon resurfacing, the radio or strobe did not work for a few OBS packages (radio: BB700, G03C-GB380; strobe: BB640, GS370, GS140) complicating night recoveries for BB640 and G03C-GB380. However, at least one unit (radio or strobe) was working underscoring the importance of the dual system.

Deck Space

We recovered and deployed a total of 61 OBS from the R/V Oceanus. All SIO gear was stored on the main deck. The CTD rosette had to be removed to provide space for the SIO acoustic rosette. Working with three different instrument types (SIO LP, Abalone, and SP) and given our pre-assigned deployment pattern required shifting gear during the cruise to make space for recovered instruments and to be able to access the designated instrument type. Craning instruments required little time and could be performed without difficulty due to favorable weather conditions when instruments were moved during the first parts of the cruise.

Another, though difficult to fix issue, is the lack of a somewhat protected area on deck for final OBS assembly on transit and away from seawater. The main deck is close to the waterline such that spray is a constant threat to electrical connectors even at relatively calm sea states.

Acknowledgements:

We would like to thank captain Jeff Crews, his crew and Marine Technician Johna Winters for their exceptional helpfulness during OBS deployment and recovery. At least one member of the crew assisted in each deployment/recovery operation and Johna or Marine Tech Intern Nikiforos Delatolas were available around the clock for recoveries/deployments and help in the lab.

Table 1. Planned locations and final OBSIP-supplied locations for 28 OBS deployed during OC1407B. All are SIO OBS; seismic sensors are Trillium 240s (LP-T240), Trillium Compact 40 s (Abalone) and Mark L-28 short period (SP), respectively. All have a DPG. JD is day of year instrument was deployed (year being 2014). Depth of final location is fixed to depth read from 3.5 kHz echosounder at drop point.

Cascadia Initiative Leg 5 2014 – OBS Deployments, Oceanus OC1407B, Nabelek and Braunmiller													
#	Sta. ID	Ins. type	Original planned location			Drop JD	Final location from OBSIP						
			Lat d	Lon d	Depth		Lat d	Lon d	Depth	Lat	lat m	Lon	lon m
1	J20D	Abalone	44.3601	-127.1084	2912	206	44.3604	-127.1085	2936	44	21.6219	127	6.5122
2	BB830	LP-T240	44.025	-127.633	2913	206	44.0244	-127.6311	2939	44	1.4624	127	37.8648
3	BB850	Abalone	44.5337	-128.0477	2877	206	44.5332	-128.046	2875	44	31.9917	128	2.7613
4	J23D	LP-T240	44.8275	-129.6815	2687	207	44.8274	-129.6805	2726	44	49.6444	129	40.8307
5	BB751	LP-T240	44.5897	-130.6577	2928	207	44.5903	-130.6532	2872	44	35.4163	130	39.1904
6	BB870	Abalone	44.0472	-130.1033	3203	208	44.0454	-130.1018	3219	44	2.7238	130	6.1075
7	BB711	LP-T240	44.1712	-129.1425	2375	208	44.1684	-129.1427	2441	44	10.1017	129	8.5648
8	BB721	LP-T240	43.7496	-129.4131	3154	208	43.7499	-129.4137	3171	43	44.9969	129	24.8203
9	J06D	LP-T240	43.2522	-128.8035	3226	209	43.2526	-128.8041	3245	43	15.1561	128	48.2472
10	BB860	LP-T240	43.7328	-128.5043	2623	209	43.7308	-128.5037	2660	43	43.8489	128	30.222
11	BB840	Abalone	43.4252	-128.0308	3261	210	43.4253	-128.0334	3278	43	25.5202	128	2.0039
12	BS820	SP	43.5800	-127.3628	2904	210	43.5799	-127.3618	2935	43	34.7945	127	21.7105
13	BS810	SP	43.2203	-126.7105	2923	210	43.2176	-126.7093	2940	43	13.058	126	42.5586
14	BS641	SP	42.9930	-127.3022	2779	211	42.9939	-127.302	2840	42	59.6345	127	18.1223
15	G37D	Abalone	42.6286	-127.3018	2811	211	42.6285	-127.3009	2805	42	37.7097	127	18.0538
16	G30D	LP-T240	41.9514	-128.2961	3154	211	41.9509	-128.2975	3179	41	57.0516	128	17.8472
17	GB171	LP-T240	41.5966	-127.4237	3444	212	41.597	-127.4254	3469	41	35.8212	127	25.5239
18	GB111	LP-T240	41.9227	-127.1712	3491	212	41.9217	-127.1716	3403	41	55.3043	127	10.2972
19	GS221	SP	41.0770	-126.9135	2991	213	41.076	-126.9152	3005	41	4.5605	126	54.9143
20	G12D	LP-T240	40.7746	-127.1367	2764	213	40.773	-127.1362	2884	40	46.3792	127	8.1738
21	GB341	LP-T240	40.3740	-127.4412	1683	213	40.3721	-127.4423	1791	40	22.325	127	26.5399
22	GS311	SP	40.4575	-125.1318	2457	214	40.4554	-125.132	2498	40	27.3252	125	7.9225
23	GB321	LP-T240	40.3940	-125.9130	2360	214	40.3922	-125.9117	2284	40	23.5346	125	54.6993
24	G11D	LP-T240	40.7863	-126.4682	3121	215	40.7845	-126.4683	3145	40	47.0708	126	28.0953
25	GS151	SP	41.6963	-126.3606	2943	215	41.6943	-126.3597	2963	41	41.6578	126	21.582
26	GS141	SP	41.6520	-125.5511	3089	216	41.6537	-125.5548	3119	41	39.2194	125	33.2908
27	GS031	SP	42.3581	-125.8565	2608	216	42.3568	-125.8614	2625	42	21.4062	125	51.686
28	BS611	SP	42.8368	-126.0141	2656	216	42.8374	-126.0116	2720	42	50.2454	126	0.6969

Cascadia Initiative Leg 5 2014 – OBS Recoveries, Oceanus OC1407B, Nabelek and Braunmiller

#	Sta. ID	Ins type	Drop location					Final location from OBSIP							Recovery Release	
			JD	hr:mn	Lat d	Lon d	Dpt 3.5	Lat d	Lon d	Depth	Lat d	lat m	Lon D	lon m	JD	hr:mn
1	BB690	LP-T240	267	8:02	43.85187	128.43682	2858*	43.8480	-128.4421	2868	43	50.8818	128	26.5261	209	15:12
2	BB700	LP-T240	267	23:06	44.67240	128.81733	2874	44.6749	-128.8184	2800	44	40.4952	128	49.1053	207	1:51
3	BB710	LP-T40	268	8:27	44.17127	129.14258	2445**	44.1709	-129.1424	2444	44	10.2537	129	8.5438	208	13:22
4	BB750	LP-T240	269	19:25	44.58980	130.65772	3010	44.5907	-130.6581	3010	44	35.4413	130	39.4853	207	16:39
5	BB740	LP-T240	270	1:13	44.06220	130.50372	3179	44.0620	-130.5033	3179	44	3.7182	130	30.1984	207	21:36
6	BB730	LP-T240	270	6:40	44.29307	129.96499	3337	44.2930	-129.9643	3337	44	17.5803	129	57.8578	208	5:36
7	BB720	LP-T240	274	16:04	43.74936	129.41323	3178	43.7515	-129.4148	3177	43	45.0921	129	24.8873	208	21:18
8	BB670	LP-T40	275	15:30	43.46692	128.40032	2951	43.4675	-128.3928	2951	43	28.0503	128	23.5653	209	20:01
9	J06C	LP-T240	276	0:14	43.25253	128.80350	3254	43.2515	-128.8067	3253	43	15.0904	128	48.4011	209	7:09
10	BB660	LP-T240	276	16:19	43.42618	127.79273	2128	43.4270	-127.7925	2182	43	25.6204	127	47.5518	210	3:32
11	BB640	LP-T240	277	10:49	42.99302	127.30197	2854	42.9900	-127.2997	2854	42	59.4004	127	17.9811	211	5:30
12	BB630	LP-T40	277	17:25	42.87742	126.63690	3340	42.8795	-126.6350	3340	42	52.7706	126	38.0996	210	21:54
13	BB650	LP-T240	278	19:32	43.46523	127.13473	2948	43.4654	-127.1357	2947	43	27.9250	127	8.1448	210	10:36
14	BS620	SP	285	8:25	43.26448	126.48809	2975	43.2642	-126.4867	2975	43	15.8508	126	29.2026	210	18:23
15	BS610	SP	285	15:00	42.83809	126.01410	2717	42.8421	-126.0200	2697	42	50.5257	126	1.2011	216	22:20
16	GS040	SP	285	19:11	42.55467	126.40308	2851	42.5559	-126.4051	2851	42	33.3558	126	24.3048	216	16:05
17	GS060	SP	286	7:20	42.62877	127.30160	2821	42.6252	-127.3019	2821	42	37.5115	127	18.1140	211	12:06
18	GS120	SP	286	12:32	42.21672	127.60416	2935	42.2176	-127.6039	2935	42	13.0561	127	36.2330	211	16:20
19	G30C	LP-T240	286	20:08	41.95144	128.29628	3185	41.9539	-128.2930	3185	41	57.2319	128	17.5787	212	0:18
20	GS240	SP	287	3:23	41.42812	128.05594	3115	41.4295	-128.0556	3115	41	25.7692	128	3.3381	212	5:24
21	GS400	SP	288	1:40	40.14164	127.82304	4510	40.1419	-127.8197	4510	40	8.5166	127	49.1849	213	17:48
22	GS290	SP	288	16:12	40.77414	127.13750	2885	40.7739	-127.1378	2885	40	46.4351	127	8.2699	213	9:34
23	GS300	SP	289	2:18	40.78637	126.46817	3151	40.7876	-126.4673	3151	40	47.2569	126	28.0374	215	6:10
24	GS390	SP	289	11:11	40.15883	126.77764	4363	40.1583	-126.7720	4363	40	9.4985	126	46.3189	214	0:18
25	G03C	LP-T240	289	20:01	40.05940	126.16255	4068	40.0562	-126.1606	4068	40	3.3729	126	9.6356	214	5:02
26	GS370	SP	290	7:05	40.15885	126.29622	1741	40.1586	-125.2965	1741	40	9.5170	125	17.7874	214	11:57
27	GS140	SP	304	15:00	41.65078	125.55080	3120	41.6529	-125.5501	3120	41	39.1734	125	33.0057	216	2:35

Cascadia Initiative Leg 5 2014 – OBS Recoveries, Oceanus OC1407B, Nabelek and Braunmiller																
#	Sta. ID	Ins type	Drop location					Final location from OBSIP							Recovery Release	
			JD	hr:mn	Lat d	Lon d	Dpt 3.5	Lat d	Lon d	Depth	Lat d	lat m	Lon D	lon m	JD	hr:mn
28	GS280	SP	305	8:03	41.03360	126.09335	3125	41.0338	-126.0934	3125	41	2.0289	126	5.6042	215	10:12
29	GS150	SP	305	19:00	41.69640	126.36067	2965	41.6964	-126.3605	2965	41	41.7825	126	21.6295	215	18:30
30	GS160	SP	305	23:48	41.44261	126.85332	2964	41.4401	-126.8533	2964	41	26.4085	126	51.2006	212	22:35
31	GS110	SP	306	9:22	41.92259	127.17118	3601	41.9197	-127.1719	3601	41	55.1823	127	10.3157	212	17:45
32	GS090	SP	306	21:37	42.00203	125.98154	2942	41.9995	-125.9829	2942	41	59.9724	125	58.9719	216	7:12
33	GS020	SP	307	7:59	42.57355	125.44800	3105	42.5730	-125.4485	3105	42	34.3809	125	26.9091	217	2:23
*: unreliable 3.5KHz depth; **: depth from 12 KHz																

Table 2. Drop and final OBSIP-supplied instrument locations of 33 OBS deployed during legs 1 and 2 of OC1309B and recovered during OC1407B. All are SIO OBS; seismic sensors are Trillium 240s (LP-T240), Trillium 40 s (LP-T40) and Mark L-28 short period (SP), respectively. All have a DPG. JD is day of year instrument was deployed (year being 2013), respectively, recovered (year 2014); times (hr:mn) are in UTC. Dpt is depth from 3.5 KHz echosounder. Depth of final location is fixed to depth read from 3.5 kHz echosounder at drop point.

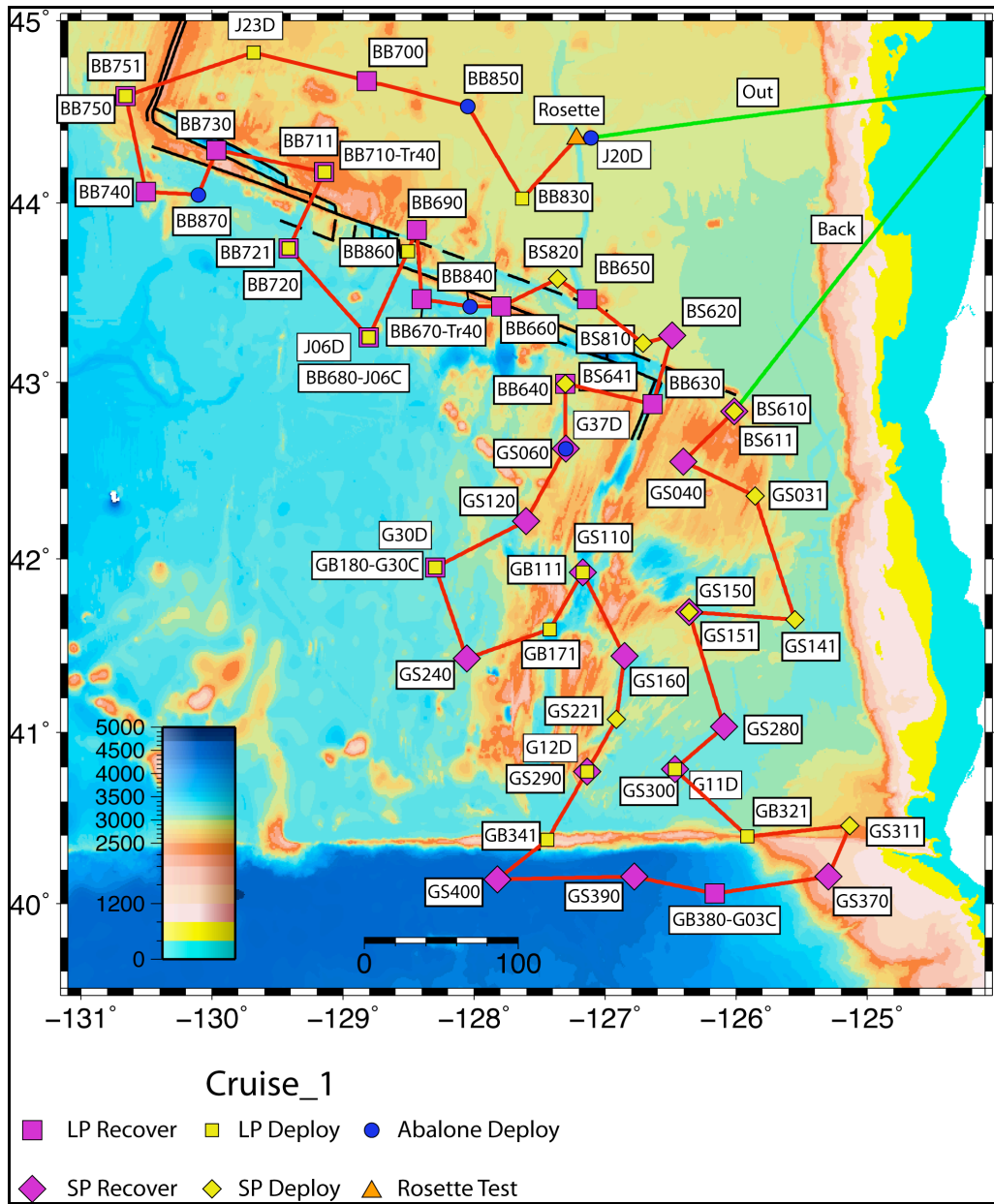


Figure 1. Track line (green and red) and SIO OBS recovery and deployment sites for cruise OC1407B. Purple: recovery. Squares are broadband (LP) and diamonds SP recoveries. Yellow and blue: deployments. Squares are broadband (LP), diamonds SP, and circles Abalone (Trillium Compact) deployments. Orange triangle is location of acoustic release test within Cascadia Channel. (BB630 is a Tr40).