Cascadia Initiative Cruise OC1205A , R.V. Oceanus, 05/12/12 – 05/21/12

The primary cruise objective was to recover 23 WHOI OBS deployed in November 2011 as part of the Year-1 Cascadia Initiative OBS array. The 23 WHOI OBS were deployed in a broad array extending from south of the Mendocino Fracture Zone, onto the Juan de Fuca plate, to the west of the Juan de Fuca Ridge, and north into Canadian waters. Thirteen OBS carry intermediate-period seismometers, and were designed and built by WHOI for the Amphibious Array with funding from the American Recovery and Reinvestment Act (ARRA). These instruments were deployed in a ~70 km spaced grid extending west from the central Juan de Fuca plate onto the Pacific plate. Ten OBS, funded by the W.M. Keck Foundation, carry broadband seismometers and strong-motion accelerometers. All 23 OBS carry a Differential Pressure Gauge (DPG). Because of their broadband response, the Keck OBS were broadly distributed across the Juan de Fuca plate and its borders to provide a reference array. These reference sites will be occupied during each of the four years of the Cascadia Initiative.

All 23 OBS were safely recovered. In contrast to the November deployment leg, weather conditions were generally very good. These OBS were deployed from the R.V. Wecoma in November 2011. Since that deployment cruise, Oregon State University (OSU) retired the R.V. Wecoma and acquired the R.V. Oceanus. The R.V. Oceanus was operated by Woods Hole Oceanographic Institution (WHOI) from 1975 until WHOI was forced to retire her in November 2011. Oceanus and Wecoma were built to the same design, but sometime in the 1990's, Oceanus was modified to carry another deck. Her main-lab, main-deck and wet-lab were also modified at this time. Recoveries were moderately challenging during a 2-day period when we had winds of 20-25 knots and seas of 11' (significant wave height). The additional deck on Oceanus relative to Wecoma meant increased windage and bringing the OBS alongside was more challenging.

The OBS at station J48 was not surveyed on the November, 2011 deployment leg because of bad weather. We surveyed this OBS just prior to recovery. We used the Edo hull-mounted 12 kHz transducer for all acoustic communication other than on-deck testing. As on Wecoma, acoustics were excellent. Mean ascent rates for the ARRA and Keck OBS were 48 ± 2 m/minute and 32 ± 1 m/minute, respectively.

In accordance with an MOU between the U.S. Navy and the National Science Foundation (NSF), the U.S. Navy have the right to redact portions of high-sample-rate (≥8 Hz sampling frequency) ground-motion and pressure data that it considers of national security interest. For OC1205A, Navy representatives from John Hopkins Applied Physics Laboratory (APL) and SAIC participated in the cruise in order to protect the Navy's interests and to provide low-pass filtered data. The Navy provided unfiltered but screened data within 90 days post-cruise.