

## CRUISE REPORT

Cruise Number: BV0403

FOCI Number: 3BV04

Ship: F/V *Big Valley*

**Area of Operations:** Gulf of Mexico

**Itinerary:**  
Depart Kodiak, Alaska 31 July 2004  
Arrive Kodiak, Alaska 7 Aug. 2004

**Participating Organizations:**  
NOAA/PMEL/OERD/FOCI

**Chief Scientist:**  
William Floering (PMEL/OERD)

**Other Personnel:**  
None

**Objectives of Cruise:** To recover damaged moorings on the Seward GLOBEC Line.

**Summary of Operations:**  
Recovered the release and instruments from the bottom section of 4 moorings on the GLOBEC Seward line.

Moorings Recovered - 4

### Summary of Cruise:

The ROV operator rented a new track point system for this cruise. His unfamiliarity with the new version of software led to additional dockside set up and testing time. Fuel was purchased prior to leaving Kodiak. We left Kodiak at 2100 hours July 31<sup>st</sup>. On the Seward GLOBEC line there were 4 damaged moorings from 2003 and one from 2002, all 5 had broken off below the bottom float. The upper portion of these moorings had drifted away; all we knew for sure was that the release was still at the original deployment site. The objective of this cruise was to locate the damaged moorings, attach a recovery line using the ROV, and bring aboard what was available to recover at each site.

Our first ROV dive was conducted at site 03-GB-4B at 1400 hours on Aug. 1<sup>st</sup>. To narrow down the search pattern we spent considerable time ranging on the release before launching the ROV. Because we have been setting moorings in the same general area twice a year for 3-4 years there were a number of old railroad wheel anchors near the location of the damaged moorings. During the first ROV dive, before we located the mooring, we managed to snag the conducting wire umbilicus for the ROV on an old anchor. As we attempted to recover the ROV the umbilicus parted. We were able to recover the ROV only because the spectra pick up line was taped to the ROV cage, that taping allowed us to pull the ROV in by hand. This broken cable was the last of the old style umbilicus wires; the newer cables have different mating plugs. Mark said the change over would require several hours of effort to disconnect and connect 35 pairs of wires on the ROV. It took a full day at anchor (Monday) to prepare the new cable and the ROV for the next dive. Tuesday morning (Aug. 3<sup>rd</sup>) we were on site at 03-GB-1B. We pinged on the release, launched the ROV, located and attached the spectra line to the mooring. The mooring wire was

snagged around the anchor and the anchor was partially embedded in the mud. We parted the spectra pick-up line during recovery. Knowing site 03-GB-1B was going to be a difficult recovery we moved to station 03-GB-2B. At GB-2B we ranged on the release, launched the ROV, connected to the mooring and began the recovery. The ROV was tangled in the spectra recovery line risking the loss of the ROV. The recovery process is complicated somewhat by the Benthos release characteristic that will not allow you to drop the anchor if the release is leaning more than 25 degrees. Essentially you have to partially recover the mooring so the release is vertical before you can drop the anchor. Taking a load on the spectra with the ROV umbilicus tangled in the spectra recovery line greatly increases the odds that the ROV will be damaged or lost. At 2330 (local time) Aug. 3<sup>rd</sup>, we had the lines untangled and the mooring aboard. We recovered an Edgetech release, a SeaBird MicroCat, an SBE39 temperature sensor, one MTR and one Aanderaa RCM-9 current meter.

The owner of the ROV said he could not continue recovery operations risking the loss of his equipment without some kind of a security line leading from the ROV to the down weight. This added line would take the tension if we tangled (GB-2) or hung up (GB-4) and, within limits, stops you from parting the umbilicus and losing the ROV. With no suitable line available on F/V *Big Valley*, the decision was made to steam to Seward during the night to purchase line. We arrived in Seward at 8am on Wed. Aug. 4<sup>th</sup>. There was no suitable line available in Seward but we were able to expedite delivery from Anchorage the afternoon of Aug. 4<sup>th</sup>. We left Seward at 1600 hrs on Aug. 4 and steamed to site 03-GB-1B.

After ranging on the release, we launched the ROV at 2130 hrs. After locating the mooring we attached the recovery line to a Microcat cage. The ROV was brought aboard and we started hauling in on the recovery line. The anchor was still fouled on the mooring wire so we had the weight of the anchor to contend with as well. After removing the Microcat, on the second pick, the anchor was hitting the stern of the ship. We were fortunate that the anchor rolled the right way freeing it from the mooring wire. The rest of the mooring was recovered and on deck by 0030 hours on Thursday Aug. 5<sup>th</sup>. We recovered one Edgetech release, 3 SBE39s, one SeaBird MicroCat and one Aanderaa RCM-9 current meter.

By 1000 hrs Thursday we were ready to deploy the ROV at mooring site 03-GBM-3. This Edgetech release indicated it had released on bottom but ranging distances were erratic and uncertain. We located the mooring and attached the recovery line to a MicroCat cage. We started recovery at 1445 and had the last instrument on board by 1600 hrs. We recovered all the instruments on GBM-3 with the exception of the top SeaCat. It appears that bolts holding the SeaCat bracket to the cage fell out. Rust in and around the bolt holes indicates that the SeaCat fell out of the cage well before recovery. Recovered from this mooring were 4 MTRs, one Eco Fluorometer, one MicroCat, one Aanderaa RCM-9 current meter, one Nirtate Meter and one EdgeTech acoustic release. This mooring is all chain. The recovered portion of the mooring separated from the surface float at a shackle. The bitter end of the chain where the mooring separated was shipped back with the other equipment.

Friday Aug. 6<sup>th</sup> at 0600 hours we started ranging on the release at site 03-GB-4B. The ROV was in the water at 0930. Because we hung on an anchor during our first attempt at site GB-4, Mark (ROV owner) added a lighter spectra line to the hook end essentially creating a weak link in the recovery line. We hooked onto the mooring but, as expected, the weak link broke and nothing was recovered. At 1230 the ROV was set up and back in the water. This is a Benthos release so we have to partially recover the mooring and take a strain on the anchor to allow the release to function. Again we located the mooring, attached the recovery line and began the recovery process. This time the spectra broke at a knot on the down weight.

At 1500 hrs the ROV was set up and ready for the 3<sup>rd</sup> dive at GB-4B. The broken piece of spectra was replaced with new line having a 20,000 lb breaking strength. On this dive we hung the ROV on the broken piece of spectra that was attached to the mooring but floating free. We recovered the ROV and prepared for the 4<sup>th</sup> dive at this site at 1730 hours. Finally all the pieces came together and we were able to attach the recovery line to the mooring and bring the instruments on board by 8pm Friday Aug. 13<sup>th</sup>. I tried to release the anchor several times but it was not until we had recovered two thirds of the mooring that the release fired and dropped the anchor. Recovered from this mooring were 2 MTRs, 1 MicroCat, 1 RCM-9 current meter and one Benthos acoustic release.

We set a course for Kodiak arriving at approximately 1500 hours on Sat. Aug. 7<sup>th</sup>. Previous arrangements had been made to spot a 20 foot container at the Kodiak Coast Guard Base. The recovered equipment was transported from the fuel pier to the Coast Guard Base and loaded in the container. I also loaded miscellaneous mooring equipment that was stored in the fisheries warehouse and in the parking lot at the Coast Guard Base.

**Future Considerations:**

Mark will provide video tapes taken by the ROV camera. These tapes will be transferred to a more suitable medium by PMEL personnel.

Success with the ROV is subject to a number of considerations. At two of the sites the ROV thrusters kicked up so much silt it was impossible to see what you were doing. The operation is very dependent on currents and weather. With only quarter horse thrusters on the ROV, and with limited station holding capabilities of *F/V Big Valley*, 15-20 knots of wind, or currents approaching 1.5 knots make conditions unworkable.

Three of the 4 recovered moorings appear to have failed because the wire parted. The wire from these recovered moorings was saved for further examination and shipped to PMEL with the recovered instruments.

There is still one failed mooring from 2002 at site GB-2. This is one that we attempted to recover last year, damaging the rigging on *F/V Big Valley* and the ROV cable. Underwater video of this site shows that the anchor is silted in and will be difficult to break loose. This has a Benthos release that will not release unless nearly vertical. This release has also been in the water 2 years and may not have battery strength available to operate successfully.

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