New discoveries in the Aleutians

By Carin Bailey Stephens

Héloïse Chenelot could feel the Steller sea lion’s sharp teeth through her dive hood. She was 30 feet underwater, on a dive near Tigalda Island in Alaska’s eastern Aleutian Islands. Six divers were in the water, but Chenelot and her colleague, Max Hoberg, seemed to be particularly attractive to the young marine mammals.

Hoberg ducked his head down into the kelp and held still. Three sea lions surrounded him. Juvenile or not, the animals were huge — each probably weighed around 300 pounds. One of the animals gently wrapped its mouth around Hoberg’s head, too.

“If they wanted to, they could crush your head in their jaws, but they didn’t. They were just curious, and they were amazingly gentle,” Chenelot said later. “A lot of thoughts go through your mind right then … but bolting to the surface in panic is obviously not an option. So you just have to think positive, calming thoughts.”

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It was the first of 440 dives the team made in the little-explored Aleutian Island chain during the summers of 2006 and 2007. There were more than 1,000 miles of coastline to explore, from near Unalaska-Dutch Harbor in the east all the way to Attu Island at the western end of the chain.

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As he climbed aboard the R/V Norseman, a 108-foot converted crab fishing vessel and the “topside” headquarters for the divers, Stephen Jewett wondered whether sea lions would be a problem on every dive. The lead diver on the expedition and chief dive officer for the University of Alaska for the past two decades, Jewett was in charge of the divers’ safety, and curious sea lions were just one of many factors he had to consider.

The divers never had any problems with sea lions again. In fact, they saw relatively few of the endangered animals on the two-year expedition. What they did see, however, was an underwater world that none of them will ever forget.

Jewett and the rest of the UAF dive team, which included Reid Brewer, Chenelot, Roger Clark, Roger Defendall, Shawn Harper and Hoberg, were part of a larger team of scientists aboard the Norseman, all with a mission to assess the overall health of the coastal waters of the Aleutian Islands. Sponsored by the U.S. Environmental Protection Agency and managed jointly by the Alaska Department of Environmental Conservation and UAF, the project focused on measuring contaminants in the water around the Aleutians and determining the productivity and biodiversity of the underwater flora and fauna of the region. The project was part of the nationwide EPA Environmental and Monitoring Assessment Program, where regions are characterized by surveys of 50 randomly selected sites. Doug Dasher, a water quality scientist with ADEC, was the principal investigator on the project.

Although the region may appear remote and pristine, the islands and their coastal waters are not immune from human activity. Concerns that numerous areas in the vast Aleutian region may be contaminated, principally by petroleum products and some PCBs and heavy metals, were an impetus for the study. Many of these sites are related to World War II and Cold War activities. One is midway along the Aleutian Arc at Amchitka Island, where the United States conducted multiple nuclear tests. The largest of those tests, Project Cannikin, resulted in a 5-megaton underground blast in 1971.

Many scientists are concerned that contaminants pose potential threats to the marine ecosystems in the Aleutian and Bering Sea regions.
Pink algae, a Coke bottle and a world war

Stephen Jewett saw it on the bottom, among the seaweed and marine creatures — a pink thing shaped like an old-fashioned glass soda bottle. He picked it up with the rest of his collection and brought it to the surface.

The team was diving in Massacre Bay on Atuq Island, the site of the only World War II combat on United States soil. Thousands of Japanese and hundreds of Americans were killed during the battle. The Norsonian had run into bad weather and the crew was anchored for protection from the winds. Unable to sample where they had planned because of weather, the divers decided to investigate Massacre Bay.

World War II artifacts were strewn on the seafloor, including coffee cups, silverware, ammunition and ammo casings, and even fully loaded shells. Among the artifacts were lots and lots of old Coca-Cola bottles.

According to Jewett, Coke was the main soft drink available during the World War II era. “This is what soldiers and sailors drank out here,” said Jewett.

Many of the submerged artifacts were coated with the hard pink crust of a coralline algae that grows extremely slowly. The Coke bottle Jewett found might have been discovered by a diver in the early 1940s, making the thin coating about 60 years old.

The pink algae is one of the oldest living plants on Earth. According to Jewett, a thickness of 8 inches can be up to 700 years old. The algae, called Clathromorphum nesovatum and Lithothamnium sp., are found throughout the Aleutian Islands, and lend a bright rosy hue to the rocks and boulders of the seafloor.

Another unique feature of these coralline algae is that they are extremely vulnerable to disturbances in the marine ecosystem. Some of them are especially sensitive to ocean acidification, and may provide important clues to changes in marine ecosystems due to global warming.
The divers and research team also had adventures above the water. After all, they were in one of the most seismically active regions in the world. Around 2 p.m. on July 13, 2007, they felt a fairly strong earthquake. According to Jewett, the tremor “travelled up the anchor line and up through the water columns” and rattled the boat. Dasher immediately got on the radio to make sure the team was safe from potential tsunamis. The quake was magnitude 5.8 and only 30 miles away, but no tsunamis were generated.

Cold hands, warm water

One week later, while the team was anchored near the Islands of Four Mountains, one of the three active volcanoes on the islands, Mount Cleveland, began to belch black smoke and ash. The Norseman was only about five miles away.

“We could see ash falling... one side of the volcano was all black and one snow covered,” said Jewett. “I suppose it’s a common occurrence in the Aleutians, but we got to witness it.”

As the team worked near Kagamil Island, they discovered a series of volcanic vents, called fumaroles, hissing steam and gases into the air. Jewett and the others wondered if vents could also be found underwater. The scientists usually discover a new species of an organism, or maybe a new genus. But to discover a new family is, according to Jewett and algae expert Lindeberg, a very big deal.

A new genus is called golden V. It was found in only two places in the region of the hydrothermal vents, each an area of about 100 square yards, although the divers spent most of a day circumnavigating Kagamil Island looking for more.

“There is a possibility that there is a correlation between the golden V kelp and the chemical constituency of the water near Kagamil Island, but we don’t know yet,” said Jewett.

A long way from home

The scientists on the Norseman were a long way from home, and it was Jewett’s job to make sure the team returned in one piece. A significant accomplishment of the two-year dive survey was the fact that not a single diver was injured.

20 new species and counting

Over the course of two summers and 440 dives, the scientists who surveyed the nearshore region of the Aleutian Islands discovered at least 20 new species. As the samples collected during the dives continue to be analyzed, scientists expect that even more species will be discovered.

Roger Clark, a marine taxonomist and consultant, is currently sorting and describing the new species. Complete scientific results from the dives are expected in 2009.

2006 Eastern Dives

A new walking or swimming anemone

4 new snails

1 new genus, perhaps family, of kelp

8 new sea stars

6 new chitons

6 new chitons

100 degrees Fahrenheit, or as Shawn Harper put it, perfect for a diver in cold water to warm his hands. The divers also found vents in the sandy areas of the seafloor:

“You could put your hands in the sand; it was nice and toasty,” said Jewett.

The divers found Beggiatoa, sulfur-dependent bacteria, growing directly above the vents. Tests are underway to determine the chemical composition of the seawater from the site.

A few feet away the divers found the same creatures as in other areas — sea urchins, anemones, sponges and other organisms — seemingly unaffected by the high water temperature and gases.

Newly discovered species

The divers discovered what they believe to be a previously unknown family of kelp in the same area. Scientists usually discover a new species of an organism, or maybe a new genus. But to discover a new family is, according to Jewett and algae expert Lindeberg, a very big deal.

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As the team worked near Kagamil Island, they discovered a series of volcanic vents, called fumaroles, hissing steam and gases into the air. Jewett and the others wondered if vents could also be found underwater. The divers donned their equipment and slipped into the sea. As soon as they were under the surface, they could see bubbles rising from the seafloor.

Armed with a thermometer and bottles to collect water samples, Jewett cautiously approached one of the hydrothermal openings. The water above the vent was 100 degrees Fahrenheit, or as Shawn

2007 Western Dives

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