Background

A team of biologists and veterinarians from NOAA, the National Park Service, and the Marine Mammal Center—with logistical support from the U.S. Fish and Wildlife Service—conducted a research project on harbor seals on Adak Island during September 2-9, 2014. The goal of this project was to collect baseline data on the seals’ health and behaviors since no prior studies have been conducted on harbor seals in the Aleutian Islands. Using small boats and tangle nets, the team captured 15 seals in Clam Lagoon, located in the northeast corner of Adak Island. The sex composition was 10 females and 5 males, and by age-class was 9 adults, 5 sub-adults, and 1 weaned pup. All seals were examined, measured, and weighed to assess their physical condition. Blood and tissue samples were collected to analyze their health, diet, and genetic composition. Although samples have not been tested yet for contaminants or diseases, all of the seals appeared to be healthy and in good condition.

Satellite tags were attached to hair on the heads or backs of 13 seals that had sufficiently completed their annual “molt” (shedding and regrowth of hair and skin). These tags will transmit the seals’ movements and diving and haul-out behaviors for up to 1 year, then will fall off during next year’s molt. Most seals also received a smaller satellite tag attached to their rear flipper which transmits location and haul-out data (no dive behavior) when the seals are out of the water. Two seals (PV2014_2004 and PV2014_2013) were not sufficiently molted and only received the flipper tags. Because of the limited transmission opportunity, movement paths from these animals are less precise.
HIGHLIGHTS

Most seals have remained close to Clam Lagoon, either staying within the lagoon or making short (10 km or less) trips to nearby waters.

A few seals initially stayed close to the lagoon but have since made longer (20-40 km) trips to nearby islands while remaining over the relatively shallow continental shelf.

One seal has made repeated long-distance trips (up to 200 km away) off of the continental shelf and into the Bering Sea. So far, no seals have traveled south into the North Pacific Ocean.

The seals’ dive depths appear to be associated with their location. Within Clam Lagoon, the seals are making shallow dives less than 30 m deep, which is likely at or near the bottom of the lagoon, while outside Clam Lagoon, the seals are making deeper dives, often more than 100 m and occasionally more than 200 m deep. These dives are likely associated with foraging.

Haul-out data have not been analyzed yet, but it appears that most seals have been spending increasingly more of their time in the water (as opposed to hauled out on land) since early October. This matches our expectations as the seals transitioned from molting (when haul-out time is at its annual peak) to a period of increased foraging in the water.

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Movements, Dive and Haul-out Behavior by Sex and Age Class

Figure 1: Map depicting the estimated movement paths for adult, male harbor seals captured and released in September 2014 in Clam Lagoon, Adak Island, Alaska. Movement paths are derived from a movement model with input from both Argos and GPS estimates.

Figure 2: Average, hourly haul-out behavior (dry=onshore, wet=offshore) for adult, male harbor seals captured and released in September 2014 in Clam Lagoon, Adak Island, Alaska. Haul-out behavior is derived from wet/dry sensors on the satellite transmitters.

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Figure 3: Dive behavior of adult, male harbor seals captured and released in September 2014 in Clam Lagoon, Adak Island, Alaska. Dive behavior is derived from a pressure/depth sensor on the satellite transmitter.

Figure 4: Map depicting the estimated movement paths for adult, female harbor seals captured and released in September 2014 in Clam Lagoon, Adak Island, Alaska. Movement paths are derived from a movement model with input from both Argos and GPS estimates.

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Figure 5: Average, hourly haul-out behavior (dry=onshore,wet=offshore) for adult, female harbor seals captured and released in September 2014 in Clam Lagoon, Adak Island, Alaska. Haul-out behavior is derived from wet/dry sensors on the satellite transmitters.
Figure 6: Dive behavior of adult, female harbor seals captured and released in September 2014 in Clam Lagoon, Adak Island, Alaska. Dive behavior is derived from a pressure/depth sensor on the satellite transmitter.
Figure 7: Map depicting the estimated movement paths for sub-adult, male harbor seals captured and released in September 2014 in Clam Lagoon, Adak Island, Alaska. Movement paths are derived from a movement model with input from both Argos and GPS estimates. Seal PV2014_2015 failed to converge within the movement model and is not shown.
Figure 8: Average, hourly haul-out behavior (dry=onshore, wet=offshore) for sub-adult, male harbor seals captured and released in September 2014 in Clam Lagoon, Adak Island, Alaska. Haul-out behavior is derived from wet/dry sensors on the satellite transmitters.

Figure 9: Dive behavior of sub-adult, male harbor seals captured and released in September 2014 in Clam Lagoon, Adak Island, Alaska. Dive behavior is derived from a pressure/depth sensor on the satellite transmitter.

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Figure 10: Map depicting the estimated movement paths for sub-adult, female harbor seals captured and released in September 2014 in Clam Lagoon, Adak Island, Alaska. Movement paths are derived from a movement model with input from both Argos and GPS estimates.

Figure 11: Average, hourly haul-out behavior (dry=onshore, wet=offshore) for sub-adult, female harbor seals captured and released in September 2014 in Clam Lagoon, Adak Island, Alaska. Haul-out behavior is derived from wet/dry sensors on the satellite transmitters.

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Figure 12: Dive behavior of sub-adult, female harbor seals captured and released in September 2014 in Clam Lagoon, Adak Island, Alaska. Dive behavior is derived from a pressure/depth sensor on the satellite transmitter.