

Habitat use and seasonal movements of adult and sub-adult bearded seals in Kotzebue Sound, Alaska.

During a 10-day field season in late-June and early-August of 2009, researchers from the National Marine Mammal Laboratory's Polar Ecosystems Program and Alaska Native hunters (*picture 1*) captured and instrumented two sub-adult and one adult male bearded seals (*Erignathus barbatus*) with satellite-linked dive recorders (SDRs) in Kotzebue Sound, AK. The seals ranged in weight from 184 to 253 kg. (406 - 558 lbs.), and are the first adult bearded seals to be instrumented with SDRs in Alaska. The study builds upon a previous cooperative effort with the Native Village of Kotzebue, the University of Alaska, Fairbanks and the Alaska Department of Fish and Game, in which 26 young-of-the-year bearded seals were tagged in the autumn of 2004-2006. The 2009 field effort is part of a pilot study funded by the Minerals Management Service and NOAA. As with previous efforts it is intended to combine local knowledge about the distribution and habits of bearded seals with the field techniques and analysis expertise of biologists.

Bearded seals are an important Alaska Native subsistence resource, living and breeding in pack ice habitat. They are also a key ecological component of arctic and sub-arctic marine ecosystems and, out of concerns for global warming and the loss of sea ice habitat, they have been petitioned for listing under the Endangered Species Act. In Alaska, they tend to occupy the more shallow waters of the Bering and Chukchi Sea shelf, areas also of interest to developers of oil and gas resources. Little is known of their seasonal movements, habitat use, or diving behavior throughout much of the year, however they are known to concentrate in specific areas for breeding and molting. Identification of these areas is important to the assessment of potential impacts from climate change and industrial activities.

The seals were captured in large-mesh twisted-monofilament nets strategically set within the pack ice near areas occupied by molting adults. The nets are visible to the seals which, apparently out of curiosity, approach them and accidentally become entangled. Captured seals are sedated, removed from the net, measured and weighed. Samples of their blood and skin are taken to assess their health and for DNA studies. Each seal was also instrumented with two SDRs: A SPOT tag, attached to the rear flipper, and a SPLASH tag, glued to the hair on the seals' head (*picture 2*). The SPOT tag relays information on haul-out timing and seasonal movements, and will transmit for up to three years. The SPLASH tag, which will fall off when the seal molts the following spring, provides the same information as well as data on the timing and depth of the animals dives. The information collected with these two tags can be used to identify important habitats, describe foraging behavior and improve population estimates.

Soon after being released, all three bearded seals moved out of Kotzebue Sound and followed the Alaska coastline north (*figure 1*). Further analyses will include investigations of the potential effects of bathymetry, ice concentration and ice extent on their movements and diving behavior. Owing to the success of this pilot program, we plan to work with other communities to identify opportunities for working together to expand the study.

By Michael Cameron and Peter Boveng

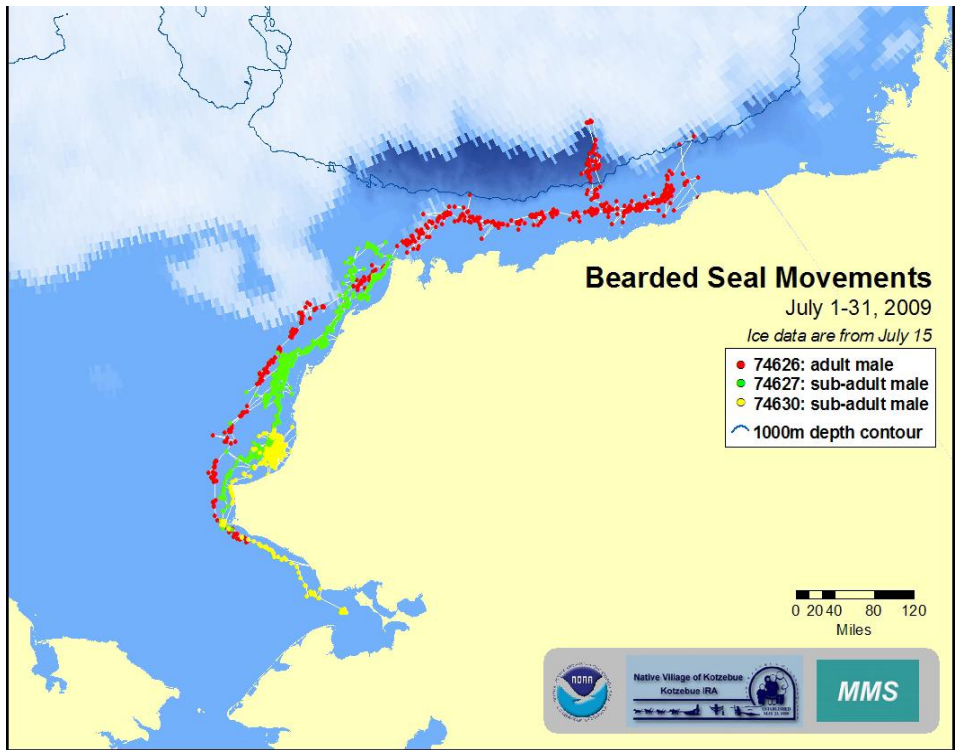
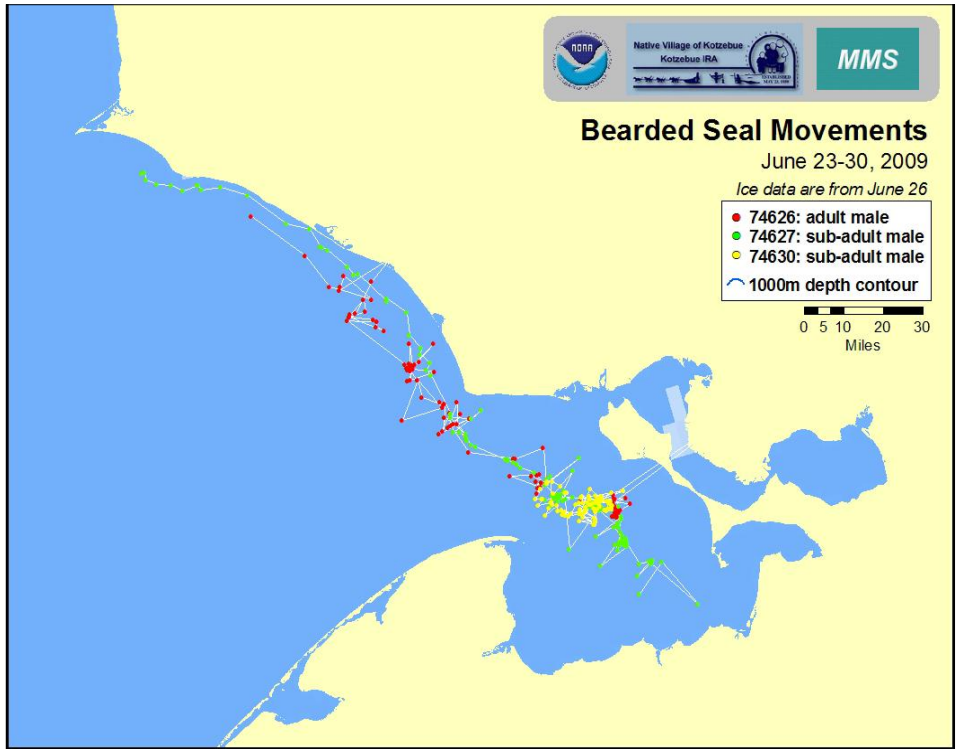


Figure 1
Three bearded seals move out of Kotzebue Sound and follow the Alaska Coastline north over a 6 week period.



Picture 1

The field team (left to right): Virgil Naylor, John Jansen, Michael Cameron, Henry Goodwin, Noah Naylor, Peter Boveng, John Goodwin, Shawn Johnson and Jeff Barger (Pearl Goodwin, David Barr and Shawn Dahle are not pictured).



Picture 2

An adult male bearded seal, instrumented with an SDR, just before entering the water.