Arctic – Marine Mammals

Results from Ice Seal Bio-monitoring in the Bering and Chukchi Seas

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Bearded (*Erignathus barbatus*), ringed (*Phoca hispida*), spotted (*P. largha*), and ribbon (*P. fasciata*) seals are the four species of Alaska's seals collectively called ice seals. They are important to the subarctic and arctic marine ecosystems and the subsistence culture of coastal Alaska Natives. There are concerns regarding the status and availability of ice seals due to changes occurring in the Bering and Chukchi seas, including changes in the thickness, persistence, and distribution of sea ice, changing concentrations of contaminants, and large volume fish removals. Little is known about the biology and ecology of ice seals and, currently, no estimates of abundance are available. Estimating abundance will be difficult due to their wide distribution in remote, ice-covered waters and large decreases in abundance are likely to go undetected until low numbers affect subsistence harvests. Rather than directly estimating abundance, we are monitoring indices of ice seal health (e.g., contaminant loads and body condition) and components of population dynamics (e.g., reproductive rates) that reflect both the status of ice seals and the marine ecosystem. The monitoring program was developed in conjunction with the subsistence harvests of Barrow, Point Hope, Diomede, Shishmaref, Nome, Gambell, Savoonga, and Hooper Bay. We are collecting seal tissues for age, contaminants, stock structure, diet, productivity, body condition, parasites and disease analyses. Our contaminants data shows Alaskan seals to have lower levels of organochlorines (e.g., PCB, DDT, HCH) and potentially toxic metals (e.g., lead, mercury, cadmium) compared to seals from other regions of the Arctic. New contaminants of interest (brominated and perfluorinated compounds) were analyzed. In ringed seals, the concentration of brominated compounds is lower in Alaska than elsewhere in the Arctic. In contrast, the concentration of one of several perfluorinated compounds (PFNA) is higher in Alaska than elsewhere in the Arctic. Preliminary data using microsatellite DNA analysis on bearded seals from Kaktovik and St. Lawrence Island indicated a significant difference in overall genotypic and allelic differentiation. Reproductive rates for bearded and ribbon seals were equal to or higher than published rates, however ringed and spotted seals were lower.

Alaska Marine Science SYMPOSIUM 2008

Book of Abstracts
for Oral Presentations and Posters

January 20-23, 2008
Hotel Captain Cook, Anchorage, Alaska

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