

Analysis of the Marginal Ice Zone and the Condition of *Phoca largha* During Both Cold and Warm Regimes in the Bering Sea

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In the Bering Sea, physical processes associated with the continental shelf form a productive upwelling system known as the "Green Belt". In years of colder temperature regimes, when the sea ice reaches the continental shelf, this upwelling enhances the high productivity of the marginal ice zone (MIZ). In warmer temperature regimes this productivity enhancement is decoupled, affecting the amount of available nutrients for the ice edge community. Consequences from changes in primary productivity are intensified with increasing trophic levels. Fish populations may decrease like Arctic cod (*Boreogadus saida*) and walleye pollock (*Theragra chalcogramma*), which are both important prey species of the pagophilic spotted seal (*Phoca largha*). The spotted seal use pack-ice on the marginal ice zone of the Bering Sea as a platform to feed, give birth, nurse their young and mate. We hypothesize that recent changes in the extent and productivity dynamics of the MIZ had strong effects on the distribution and community structure of the spotted seal, among others seasonal distribution, migration patterns, nutritional status, and reproductive success. A retrieval of archival data will endeavor to determine how changes in ice substrate and prey dynamics of the Bering Sea have affected the condition of the spotted seal. A comprehensive analysis to determine the location and status of the MIZ in the Bering Sea using SAR (Synthetic Aperture Radar) and AVHRR (Advanced Very High Resolution Radiometer) satellite sensor data from both cold (early 1970's) and warm (1990's) regimes will be plotted with archived, spotted seal distribution data collected by the Alaska Department of Fish and Game (ADFG) using the GIS. Additionally, primary production data from cruise reports, supplemented with satellite

data (SeaWiFS (Sea-viewing Wide Field-of-View)) will be included in the assessment of the MIZ and correlated with ADFG archived data of pup weight and morphometrics.

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