

Interspecific comparison of overwintering behaviour between diving and surface feeding subarctic seabirds

*Takashi Yamamoto^{1,2}, Nobuo Kokubun¹, Dale M. Kikuchi³, Nobuhiko Sato³,
Akinori Takahashi^{1,3}, Alexander Kitysky⁴, Yutaka Watanuki²

¹National Institute of Polar Research, Japan, ²Graduate School of Fisheries Sciences, Hokkaido University,

³Department of Polar Science, Graduate University for Advanced Studies, SOKENDAI, ⁴University of Alaska Fairbanks

After the breeding season, most mobile top predators leave their breeding locations, and utilize regions where environmental conditions (i.e. resources availability) are or become favorable for them without any constraints relating to breeding. Thus, changes in their at-sea distributions during this period should serve as an informative indicator for dynamics of lower trophic level (e.g. fish and zooplankton) in the ecosystem of a given region. Furthermore, as body conditions during the non-breeding season likely affect the subsequent breeding performance as a carry-over, knowledge of species' overwintering ecology may be a key to predicting future possible effect of climate change on their population dynamics in addition to that during the breeding period. We tracked overwintering distributions of three subarctic seabirds breeding on St. George Island (56°N, 169°W) located in the southeast Bering Sea during 2013/2014 using light-level geolocators: thick-billed murre *Uria lomvia* (TBMU; n = 7), common murre *U. aalge* (COMU; n = 5), and red-legged kittiwake *Rissa brevirostris* (RLKI; n = 5). During the non-breeding period, RLKIs migrated north along the shelf break in the Bering Sea (known as productive "Greenbelt"), and later moved to the Okhotsk Sea and Kuril Islands. Then, they returned back to areas around Aleutian Islands in March-April. On the other hand, TBMUs and COMUs remained largely in the continental shelf region of eastern Bering Sea throughout. Such the interspecific difference in non-breeding distributions between kittiwakes and murrens may relate to their foraging characteristics. During the breeding period, RLKIs feed mainly on vertically migrating myctophids by surface feeding, while TBMUs and COMUs feed on pollocks *Theragra chalcogramma*, sand lance *Ammodytes hexapterus Pallas*, and squids by diving. Recent reduction of sea ice has been a serious concern in the Pacific sub-Arctic and Arctic seas. However, year-round dynamics of organisms in these regions in terms of abundance and distribution have been relatively elusive due to logistical difficulties, though satellite imageries provide information on seasonal physical and primary productivity conditions. The overwintering distributions of diving and surface feeding seabirds may provide an insight into distributions and availability of lower trophic organisms at the surface and in depth in relation to seasonal sea ice condition in this region.