

SF₆によるカナダ海盆における太平洋冬季水の水塊年齢の分布 Age of the Pacific Winter Water in the Canada Basin estimated from SF₆

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In the Pacific sector of the Arctic Ocean, Pacific Winter Water (PWW) distributes between 100m and 200m depths. Because the PWW has high nutrient concentrations and low pH, its spreading pathway has implications on primary production and ocean acidification in the Arctic Ocean. In this study, we have observed distribution of SF₆, a transient tracer alternative to CFCs, in order to trace newly formed PWW into the Canada Basin.

Sampling was carried out in summer of 2013 on the CCGS Louis S. St-Laurent. Seawater at the core of PWW (salinity = 33.1) were collected in Niskin bottles and then transferred into custom-made glass bottles. Samples were kept at low temperature and brought back to Japan. Concentrations of SF₆ in seawater samples were determined by an ECD-GC following the method described in Bullister and Wisegarver (2008).

Results show that younger PWW distributes at the periphery of the Beaufort Gyre, a major anticyclonic circulation in Canada Basin. The age of PWW estimated from SF₆ was 13~15 years in the center of the gyre, whereas age was 6~9 years around the gyre. From the distributions of SF₆ age, dissolved oxygen and nutrients, it is suggested that there is a pathway of PWW from the Siberian shelves or slopes into the northeastern Canada Basin.

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