

Surface water changes during transit from North Pole to Fram Strait

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Ice drift recorded by ice buoys shows a relatively direct pathway of ice from the North Pole to Fram Strait. An ice tethered buoy deployed by RV Polarstern in September 2015 during GEOTRACES cruise GN04 at 89°N was recovered in August 2016 at 76°43'N in Fram Strait during GEOTRACES cruise GN05.

Does the surface water follow a similar pathway? Tracer data collected during these two expeditions can tell to what extent the water in the East Greenland Current (EGC) can be considered a downstream extension of the Transpolar Drift (TPD) at the North Pole.

The observed reduction of ²²⁸Ra activities and ¹²⁹I/²³⁶U ratios in the EGC compared to the TPD can be explained either by a much longer (order 3-4 years) travel time than suggested by the ice drift, or by admixture of surface waters from other, presumably Pacific sources.

The pathways followed by surface water in a coupled sea-ice-ocean model suggest that surface water follows a more variable path and takes more time than the ice for the transit to Fram Strait. We will discuss whether macronutrient relationships or dissolved radiogenic Nd isotopes give evidence for a change in the contribution of waters of Pacific origin.