

The Atlantic Water boundary current north of Svalbard

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Abstract Text:

Atlantic Water (AW) carries a vast amount of heat and salt into the Arctic Ocean, circulating through the various basins via a system of boundary currents. This fundamentally influences the hydrographic structure of the Arctic and ventilates the lower halocline. Despite the importance of AW to the Arctic system, we presently don't know how much AW is transported in the boundary current system and how the water is transferred into the interior. Here we present results from a shipboard hydrographic/velocity survey of the AW current north of Svalbard, roughly 250 km to east of Fram Strait, carried out in September 2013. The survey consisted of a series of sections across the continental slope and spanning the Kvitøyra Trough. There was clear evidence of the AW boundary current flowing eastward, centered near the 200 m isobath. We examine the alongstream evolution of the current and the properties of the AW within it. A small portion of the current enters the Kvitøyra Trough and we describe the circulation within the trough. Our survey offers one of the first robust transport estimates of the AW boundary current emanating from Fram Strait.