



The Arctic Front in the Fram Strait in autumn 2011

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The front between Atlantic water carried northward by the main branch of the West Spitsbergen Current and the cooler, fresher Arctic domain in the central Fram Strait, here called the Arctic Front, is important because of the exchange of heat and salt across it. The marked water mass boundary and the dynamics of the front also profoundly affect the living conditions for marine organisms. A northwest-to-southeast transect across the Arctic Front with concurrent shipboard and glider measurements was done in September 2011. The CTD data, nutrient and pigment samples, and underway ADCP data from the research cruise are complemented by the glider observations of temperature and salinity at higher horizontal resolution. In addition, images from the ship's scientific echo sounder are used to qualitatively describe the water column structure and distribution of marine organisms along the transect. Crossing the front from northwest to southeast, the near-surface (5 m) temperature increased by more than 4°C and salinity increased by 0.98 PSU between stations 19 km apart. The front was thus clearly marked in salinity and temperature in the upper 200 m, but below the surface layer it was largely density compensated. The highest chlorophyll-a concentrations were found in subsurface maxima on the Arctic side of the front. We investigate the hydrographic structure of the front, considering properties relevant to cross-frontal exchange and mixing. We also assess the environmental conditions on each side of the front – for example mixed layer depths, nutrient availability, and bio-optical properties – and their implications for marine life.