



Extract from:

Berge, Jørgen, (2005) and Geir Johnsen, Frank Nilsen, Bjørn Gulliksen

„Ocean temperature oscillations causing the reappearance of blue mussels in Svalbard after 1,000 years of absence“

<http://www.unis.no/40>

These current systems transport Atlantic Water (AW), as an extension of the Gulf Stream system, with salinity >34.90 psu and temperature >3°C when it enters the Arctic Ocean. Here it meets the fresher and colder Arctic Water (ArW) with salinity between 34.3-34.8 psu and temperatures below 0°C. The transport time of water masses from Northern Norway (Lofoten / Vesterålen area at ~69°N, see Fig 1) to the shelf areas outside Isfjorden in Svalbard (a distance of approx. 1000 km) is estimated to be between 32-38 days for an average current speed between 0.30-0.35 ms⁻¹ (Fig 1B-C). These estimates are based on time series observations of the NwASC and WSC. In terms of inter-annual variability, the annual mean volume transport of AW in the Svinøy section (a site at 62°N used for estimation of water transport by the NwAC) was at an absolute minimum in 2001 and increased to an absolute maximum in 2002.

>>The Norwegian Atlantic Current (NwAC); Norwegian Atlantic Slope Current (NwASC) & West Spitsbergen Current (WSC)<<.

Extract from:

Nilsen, J. Even Ø., (2006) and Eva Falck

„Variations of mixed layer properties in the Norwegian Sea for the period 1948–1999“

Progress In Oceanography, 70, p. 58-90

In the region around Ocean Weather Ship M (OWSM) in the Norwegian Atlantic Current (NwAC) the mixed layer depth varies between ~20 m in summer and ~300 m in winter. The depth of the wintertime mixing here is ultimately restrained by the interface between the Atlantic Water (AW) and the underlying water mass, and in general, the whole column of AW is found to be mixed during winter. In the Lofoten Basin the mean wintertime mixed layer reaches a depth of ~600 m, while the AW fills the basin to a mean depth of ~800 m. The temperature of the mixed layer at OWSM in general varies between 12 °C in summer and 6 °C in winter. Atmospheric heating controls the summer temperatures while the winter temperatures are governed by the advection of heat in the NwAC. Episodic lateral Ekman transports of coastal water facilitated by the shallow summer mixed layer is found important for the seasonal salinity cycle and freshening of the northward flowing AW. Atmospheric freshwater fluxes have no significant influence on the salinity of the AW in the area. (Position of Ocean Weather Ship M (OWSM): 66° North and 2° East)

Extract from:

Joanna Gyory, (2008) and A. J. Mariano, E. H. Ryan.

„The Norwegian & North Cape Currents.“

www.oceancurrents.rsmas.miami.edu/atlantic/norwegian

The WSC is the northernmost extension of the Norwegian Atlantic Current. It flows poleward through eastern Fram Strait along the western coast of Spitsbergen. A mainly barotropic current, the WSC appears to be predominantly steered by the bathymetry. It is about 100 km wide and is confined over the continental slope, where it reaches its maximum current speed of 24 to 35 cm s⁻¹ at the surface. Because it transports relatively warm (6 to 8°C) and salty (35.1 to 35.3) Atlantic Water, the WSC keeps this area free of ice. At around 79°N the WSC splits in two. The Svalbard branch stays close to the continental shelf of Spitsbergen, flowing north and east and eventually sinking and spreading at intermediate depths.