

Shelf variability and the forcing of hydrographic changes within Sermilik fjord

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Two years of mooring data from the mouth of Sermilik fjord are used to investigate oceanic variability on the inner shelf and how these signals penetrate into the fjord. The dominant scale of variability on the shelf is between 4--15 days and manifests itself as a vertical motion of the density interface between the fresh, surface waters of the East Greenland Coastal Current and the saltier, warmer subsurface waters that have penetrated on to the shelf from the Irminger Sea. Much of this variability is mirrored in the fjord showing the importance of this shelf variability in forcing dynamic changes within the fjord. A large part of shelf variability can be accounted for by the impact of Greenland barrier winds, forcing downwelling at the coast and a depression of isopycnals. This is in agreement with previously proposed mechanisms through which the coast-parallel winds could drive strong exchange between Sermilik fjord and the Greenland shelf. It is likely though that purely oceanographic processes on the shelf also play a role in forcing some of the observed variability.