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Observed increase in freshwater transport in the East Greenland Current north of Denmark Strait

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We present liquid freshwater transports of the shelfbreak East Greenland Current (EGC) and the separated EGC determined from mooring records from the Kögur section north of Denmark Strait between August 2011 and July 2012. The 11-month mean freshwater transport (FWT) of these two branches was 65±11 mSv to the south (relative to a salinity of 34.8). Approximately 70% of this was associated with the shelfbreak EGC and the remaining 30% with the separated EGC. Very large southward FWT ranging from 160 mSv to 120 mSv was observed from September to mid-October 2011 and was foremost due to anomalously low upper-layer salinities. The FWT on the Greenland shelf was also estimated using additional inshore moorings deployed from 2012-2014. While the annual mean ranged from nearly zero during the first year to 18 mSv to the south during the second year, synoptically the FWT on the shelf can be significant. Furthermore, an anomalous event in autumn 2011 caused the shelfbreak EGC to reverse, leading to a large reduction in FWT. This reversed circulation was due to the passage of a large, 100 km wide anticyclone originating upstream from the shelfbreak. The late summer FWT of -131 mSv is two and a half times larger than earlier estimates based on sections in the late-1990s and early-2000s. This increase is likely the result of enhanced freshwater flux from the Arctic Ocean to the Nordic Seas during the early 2010s when also a significant increase of Pacific Water in the EGC was observed. Preliminary results obtained from the long-term ocean observing system in Fram Strait are included to compare the increased FWT seen in 2011-2012 with interannual variations in Arctic freshwater outflow during the last decade.