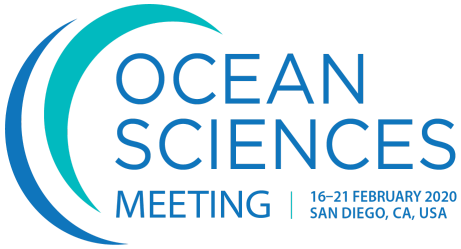

HE14A-1921 - The nature and origin of monthly to seasonal hydrographic signals in the Denmark Strait Overflow

Monday, 17 February 2020

16:00 - 18:00

SDCC - Poster Hall C-D

Abstract

Sixteen years of moored observations from the core of the Denmark Strait Overflow (DSO) on the Greenland slope in the Irminger Basin are used to examine monthly to seasonal hydrographic signals. Our analysis reveals the presence of an annual salinity cycle, with freshening in the first half of the year and an increase in salinity in the second half. The magnitude of freshening exceeds 0.04 in 1999, 2004, 2005 and 2014. There is no evidence of this signal upstream in the deepest part of the Denmark Strait Sill, which is fed exclusively by the North Icelandic Jet. Instead, we argue that the signal originates from a lighter source of DSO – either the East Greenland Current or the Irminger Current. Results from a case study in 2011-12 indicate that the East Greenland Current is the more likely origin. Specifically, we show the propagation of two freshening signals from the East Greenland Current 200 km north of Denmark Strait to the core of the DSO at the downstream mooring array (700km downstream), with a transit time of 10 weeks. Previous research has linked remote wind forcing (at Denmark Strait and to the north) with DSO salinity in the Irminger Basin. Here, we use ERA-5 reanalysis output in tandem with the full 16 years of mooring observations – a longer time frame than any previous study – to determine the nature of this relationship. A correlation analysis between a variety of atmospheric forcing metrics and our oceanographic time series are presented, and the implications for the structure and stability of the deep overflow are discussed.

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Kinematic Structure and Dynamics of the Denmark Strait Overflow

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TEMPORAL VARIABILITY OF PATHWAYS OF DENSE WATER TO DENMARK STRAIT IN A MODEL

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Effects of Horizontal Resolution in Numerical Models on Evolution of Denmark Strait Overflow and Energy Transfers

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