



## **Extreme Irminger Sea Winter Heat Loss Revealed by Ocean Observatories Initiative Mooring and the ERA5 Reanalysis**

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The first in situ characterisation of multi-winter surface heat exchange at a high latitude North Atlantic site will be presented using ground-breaking measurements from the Ocean Observatories Initiative Irminger Sea surface mooring (60° N, 39° 30' W). The data reveals strong variability (Dec 2014 net heat loss nearly 50% greater than Dec 2015) due primarily to variations in frequency of intense short timescale (1-3 days) forcing. Combining the observations with the new high resolution ERA5 atmospheric reanalysis, the main source of multi-winter variability is shown to be changes in frequency of Greenland tip jets (present on 15 days in Dec 2014, 3 in Dec 2015) that can result in hourly mean heat loss exceeding 800 Wm<sup>-2</sup>. Furthermore, a new picture for atmospheric mode influence on Irminger Sea heat loss is developed whereby the East Atlantic Pattern limits the ability of the North Atlantic Oscillation to generate strong losses and thus deep convection. Early results from the ongoing 2018-19 deployment will also be presented.