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## Ventilation and oxygen export in the Labrador Sea

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The Labrador Sea is one of the few regions where ventilation can replenish oxygen to the deep ocean, owing to wintertime deep convection that occurs primarily in the center of the basin. While some recent studies have aided in quantifying the amount of oxygen taken up during Labrador Sea Water (LSW) formation, less is known about how different spreading pathways of LSW contribute to the export of oxygen.

In this study, we use oxygen data from the 53N mooring array in the boundary current at the exit of the Labrador Sea, together with Argo float data, in order to investigate the connection between deep convection, spreading of LSW, and oxygen export. We find that the annual cycle of the oxygen concentration is driven largely by an increased input of newly formed LSW into the boundary current in the spring and summer. The resulting oxygen increase is a result of a fast, direct southward pathway of LSW, and we estimate that the associated oxygen export accounts for about half of the uptake in the interior. The 4-year record that is presently available also indicates that the strength of the oxygen export varies interannually, which may be related to changing convection patterns.

Overall, our results highlight the important role that the Labrador Sea plays in supplying oxygen to the deep ocean, and represent a first step towards better understanding the ventilation pathways out of this critical region.