



## **The air-sea transformation and diapycnal overturning circulation within the Nordic Seas**

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Air-sea flux climatologies and reanalyzes show that the bulk of the oceanic heat and buoyancy loss over the Nordic Seas takes place over interior regions not easily accessible by the time-mean large-scale currents. Eddy transport of heat and buoyancy, from the boundary currents and into the deep basins, is thought to be a key mechanism. Here we use gridded observations, theory and a modern parametrization of eddy transport to quantify the buoyancy budget of this region. The calculations confirm that mean currents are unable to explain the air-sea transformation that takes place over the interior basins of the Nordic Seas and that eddy transport instead dominates. The parametrization of eddy transport also suggests a significant overturning cell between the eastern and western parts of the Nordic Seas. This cell is, however, unaccounted for in the remaining data sets studied here.