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Transport and variability of the East Reykjanes Ridge Current

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The principal surface features of the subpolar gyre circulation in the Iceland Basin include the northward flowing North Atlantic Current (NAC) in the eastern part of the basin and a southwestward flow along the eastern flank of the Reykjanes Ridge - the East Reykjanes Ridge Current (ERRC). The ERRC is effectively a western boundary current that recirculates a portion of the NAC as well as Labrador Sea water within the Iceland Basin. Previous estimates of the ERRC have been made from a limited number of hydrographic and ADCP sections, but continuous estimates of its transport have not been available until recently. Since 2014, the OSNAP project has maintained the first continuous Eulerian array across the North Atlantic Subpolar Gyre, from Labrador to Greenland, and from Greenland across the northern North Atlantic to Scotland. In the Iceland Basin, continuous measurements of the ERRC have been maintained through ADCPs, current meters and dynamic height moorings at multiple mooring sites near 58°N. Together with satellite altimetry and Argo profile and drift data, the mean transport and synoptic variability of the ERRC are studied for the period from July 2014 to July 2018. Results show that the ERRC is a highly variable, nearly barotropic flow with a mean southwestward transport along the OSNAP line of greater than 10 Sv. The evolution of the ERRC system along the Reykjanes Ridge from the northern Iceland Basin to its eventual recurvature into the Irminger Basin is also described.