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^{129}I Transport through the Labrador Sea in Denmark Strait Overflow Water

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^{129}I ($t_{1/2}$ = 16 million y) discharged from nuclear fuel reprocessing plants in France and the UK is transported into the Nordic Seas on time scales of 3-5 y. Tracer ^{129}I is subsequently injected into intermediate waters that overflow the sills between Greenland, Iceland and Scotland and ventilate the North Atlantic Deep Waters (NADW). During the early 1990s, discharges of ^{129}I from European nuclear fuel reprocessing plants increased by 600% resulting in a large, well resolved, tracer "front" whose passage through the Nordic Seas is presently being observed by a time-series of ^{129}I measurements on the WOCE (AR7W) section in the Labrador Sea and on two sections south of Halifax, NS and Cape Cod, MA across the Deep Western Boundry Current (DWBC). The highest ^{129}I levels in the Labrador Sea were measured below depths of 3000 m in Denmark Strait Overflow Water (DSOW). These levels increased by about 300% between 1997 and 2001 to values $>$ 40 x 10^7 atoms/l and have increased only slightly since that time, indicating that the leading edge of the tracer "front" from the early 1990s entered the NADW during this period. Using a simple mixing/advection model, ^{129}I and CFC-11 results were used to calculate transit times of approximately 2 y for the transport of DSOW from formation regions in the Nordic Seas to the Labrador Sea. However, this ^{129}I tracer front had not reached the Halifax or Cape Cod sections by May, 2006, establishing a lower limit for the transit time of about 8 years for the flow of DSOW to these locations from the Labrador Sea and 10 years from the Nordic Seas.