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Arctic shelf boundary current from models and observations

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The contribution of the Arctic Boundary Current in the Laptev Sea to the Eurasian Basin halocline was examined using model and observational data. The results suggest a double-core current: a conventional Atlantic Water flow, and a fast, upper-shelf-slope current, with a strength almost half of the Atlantic Water flow, bringing light Barents Sea waters into the Arctic Ocean. Winds in the eastern Barents Sea was found to be the main driver of the shelf-slope current, acting through Ekman convergence and potential vorticity inflow mechanisms. The importance of these mechanisms for the Arctic self-slope jet system is addressed. The model results show the halocline loss in the Laptev Sea through intensive mixing and export. The advective-convective renewal of the Eurasian Basin halocline have a timescale of ca. 26 years.