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Physical manifestations and ecological implications of Arctic Atlantification

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The Atlantic gateway to the Arctic Ocean is influenced by vigorous inflows of Atlantic Water. Particularly since 2000, the high-latitude impacts of these inflows have strengthened due to climate change driving so-called 'Atlantification' - a transition of Arctic waters to a state more closely resembling that of the Atlantic. In this review, we discuss the physical and ecological manifestations of Atlantification in a hotspot region of climate change reaching from the southern Barents Sea to the Eurasian Basin. Atlantification is driven by anomalous Atlantic Water inflows and modulated by local processes. These include reduced atmospheric cooling, which amplifies warming in the southern Barents Sea; reduced freshwater input and stronger influence

of ice import in the northern Barents Sea; and enhanced upper ocean mixing and air-ice-ocean coupling in the Eurasian Basin. Ecosystem responses to Atlantification encompass increased production, northward expansion of boreal species (borealization), an increased importance of the pelagic compartment populated by new species, an increasingly connected food web and a gradual reduction of the ice-associated ecosystem compartment.