



The changing Arctic Ocean - observations during IPY

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In recent decades large variations in water mass characteristics of the Arctic Ocean have been observed. These changes have largely been advected to the Arctic Ocean from the North Atlantic. The Eurasian Basin, through its connections with the Nordic Seas via Fram Strait and the Barents Sea, is the most ventilated of the Arctic Ocean basins but it is also the part of the Arctic Ocean where the most profound transformations in water mass properties occur. International observation efforts, among them measurements during the Polarstern cruise SPACE from summer 2007 demonstrate how temperature and salinity anomalies, entering the Arctic Ocean through Fram Strait, propagate along different circulation loops through the different basins. The fact that they now can be traced in this way suggests that the strength of the water mass transformation in the Arctic Ocean has weakened, the cause being mainly higher atmospheric temperature, implying less cooling, and to a smaller degree a larger atmospheric freshwater transport to the Arctic. This reduces the dense water production on the shelves and thus the ventilation of the deeper layers of the Arctic Ocean. This could signal a larger change, where the deep water formation in the Arctic Mediterranean Sea eventually ceases and the circulation shifts from one strongly affected by thermohaline processes on the shelves to one dominated by the wind field. Observations from the last 10-15 years are used to examine the variations in the water mass characteristics, mainly in the Eurasian Basin, to determine if such changes in the water mass transformations have taken place.