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Arctic Mediterranean Exchanges: A consistent volume budget and trends in transports from two decades of observations

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Conditions in the Arctic are in part driven by the ocean state in the Arctic Mediterranean (AM), the collective name for the Arctic Ocean, the Nordic Seas, and their adjacent shelf seas. Exchange between the lower latitude ocean basins and this region occurs through the Bering Strait (Pacific inflow) and through the passages across the Greenland-Scotland Ridge (Atlantic inflow). These waters are subsequently modified within the AM. The modified waters leave the AM in several flow branches, which are grouped into two different categories: (1) overflow of dense water through the deep passages across the Greenland-Scotland Ridge, and (2) outflow of light water (surface outflow) on both sides of Greenland. These exchanges transport heat and salt into and out of the AM and are important for conditions in the AM. They are also part of the global ocean circulation and climate system. Attempts to quantify the transports by various methods have been made for many years, but only recently, the observational coverage has become sufficiently complete to allow an integrated assessment of the AM-exchanges based solely on observations.

In this EGU contribution, we focus on the observations (incl. volume transport time series) of all the main AM-exchange branches collected in the last 20 to 30 years.