



Distribution of $\delta^{18}\text{O}$ -18 in the upper water column of the Greenland, Norwegian, and Iceland seas

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The $\text{H}_2^{18}\text{O}/\text{H}_2^{16}\text{O}$ ratio of water (typically expressed as $\delta^{18}\text{O}$) has been proven as valuable tool in freshwater studies of the Arctic Ocean and the Nordic seas. Specifically, it has been shown that $\delta^{18}\text{O}$, in combination with salinity and nutrients (e.g., PO_4^*) provides quantitative information on the contributions of the individual freshwater sources (meteoric water including river runoff, sea ice meltwater and Pacific Water) to the overall amount of freshwater contained in the upper layers of the northern high latitude seas. Whereas the collection of ^{18}O samples in the Arctic had made significant progress in the late 1980's and during the 1990's, the coverage in the Greenland, Norwegian and Iceland seas was very incomplete. The cruise of the Swedish icebreaker ODEN to the East Greenland Current in conjunction with the cruise of the U.S. research vessel KNORR to the Greenland, Norwegian, and Iceland seas in 2002 allowed us to obtain a quasi-synoptic coverage of these regions at high spatial coverage. We present the new $\delta^{18}\text{O}$ fields in the context of hydrographic and nutrient measurement and evaluate them in terms of the fractions of meteoric water, Pacific water and sea ice meltwater. The water column inventories of the individual freshwater components are estimated and compared along the pathway of the East Greenland Current. The results are compared to inventory calculations obtained from sections completed in the Arctic Ocean during several cruises in the 1990's.