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Oxygen isotope constraints on the glacial Atlantic surface water hydrology

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The role of the hydrologic cycle during glacial-interglacial climate change is still poorly understood. δ^{18}O of sea water (δ^{18}Ow) at the sea surface is related to the hydrological cycle and can be reconstructed from oxygen isotope ratios of shallow dwelling foraminifera preserved in deep sea sediments. Here we present a global compilation of oxygen isotope measurements from the last glacial maximum. Combined with new estimates of sea surface temperature, these measurements demonstrate that the hydrological cycle underwent profound changes during the past $\sim$20.000 years, with higher δ^{18}Ow in the subtropics and lower δ^{18}Ow in the mid and high latitudes of the Atlantic. This pattern is consistent with an increase of evaporation-precipitation (e-p) in the subtropics and a decrease of e-p in mid and high latitudes. Furthermore our data provide evidence for a southward shift of the intertropical convergence during the Last Glacial Maximum.