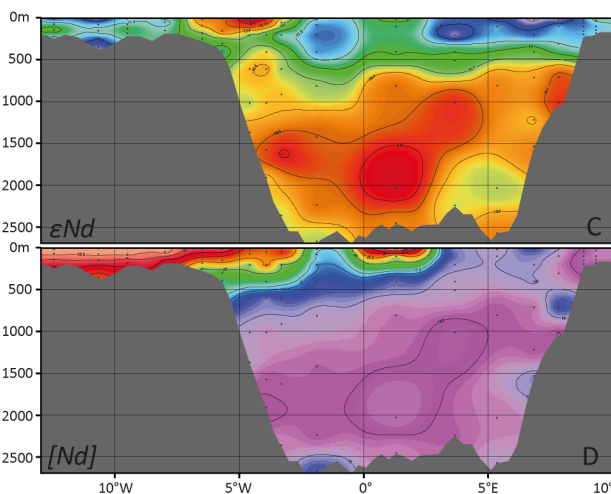
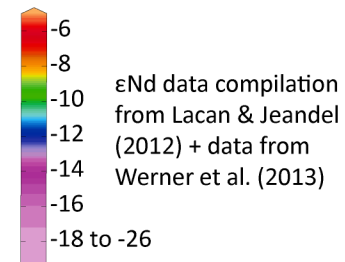


Dissolved Nd isotopes and REE concentrations in the Transpolar Drift System of the Arctic Ocean

Bilateral project „The Transpolar System of the Arctic Ocean (Transdrift)“ (Sub-project „Transpolar Fluxes“) funded by the German Ministry of Education and Research (BMBF) and the Ministry of Education and Science of the Russian Federation

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Project duration: 02/2013 - 02/2016

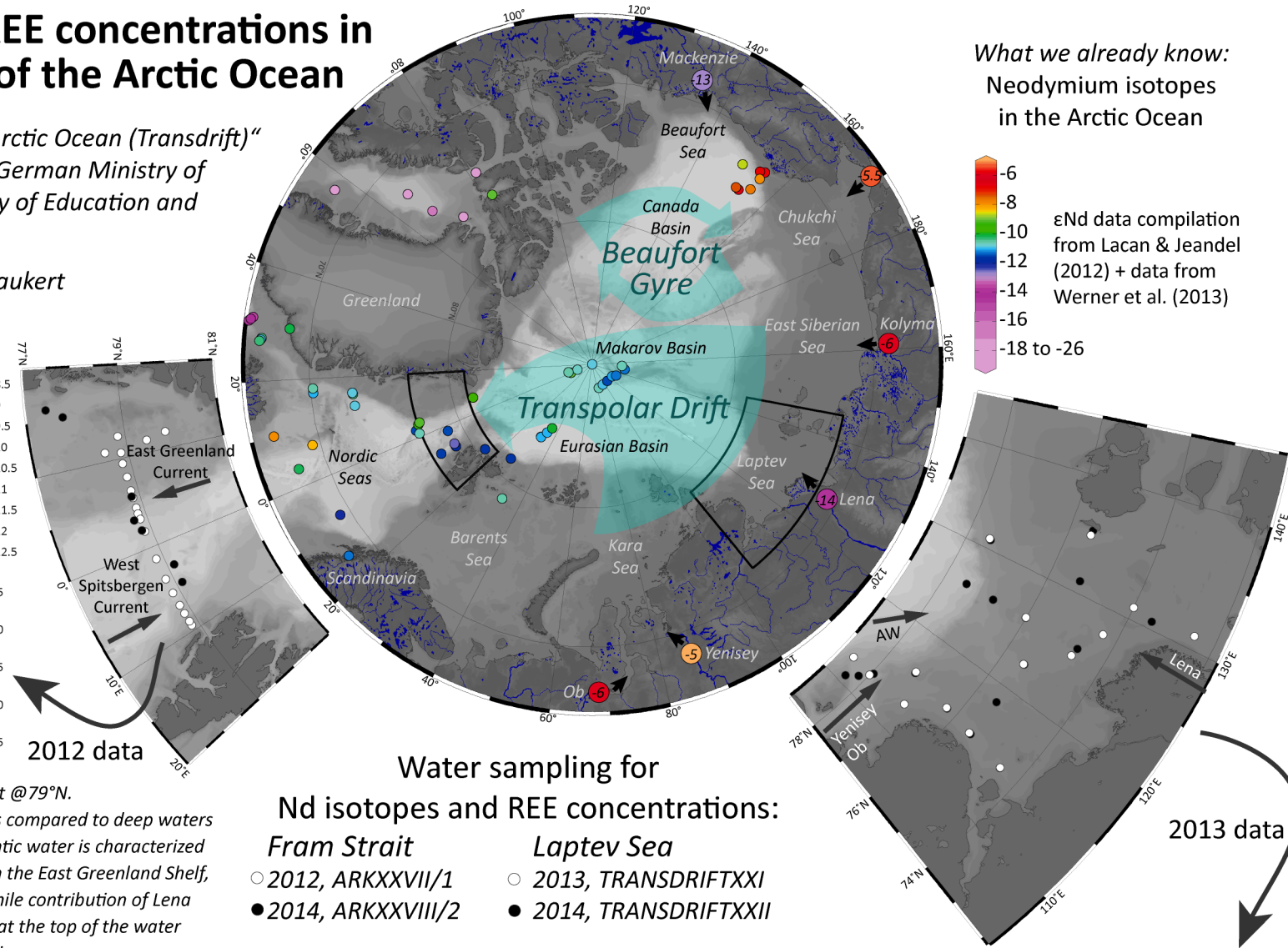
What we already know:
Neodymium isotopes in the Arctic Ocean



Results figure 1: Nd isotopes and concentrations in the Fram Strait @79°N. Deep waters have similar isotopic signatures and concentrations compared to deep waters from the Greenland Sea and Arctic basins. Warm inflowing Atlantic water is characterized by unradiogenic εNd values (-12) and low Nd-concentrations. On the East Greenland Shelf, a radiogenic signal (-9) points to contribution of Pacific water while contribution of Lena or Mackenzie river water could explain unradiogenic signatures at the top of the water column, accompanied by high Nd-concentrations and low salinities.

The sub-project "Transpolar Fluxes" focuses on the variability of water mass and matter transport within the Transpolar System from the Laptev Sea (Siberian Arctic) to the Fram Strait and its impact on the sensitive Arctic marine ecosystem. An approach including dissolved and particulate rare earth element (REE) compositions and radiogenic neodymium (Nd) isotopes measured by single (quadrupole) and multi-collector inductively coupled plasma mass spectrometry as well as a range of additional parameters is employed.

References:
Lacan, F., Jeandel, C. (2012): Neodymium isotopic composition of the oceans: A compilation of seawater data. *Chemical Geology* 300-301, 177-184
Werner, K., Frank, M., Teschner, C., Müller, J., and Spielhagen, R.F. (2014): Neoglacial change in deep water exchange and increase of sea-ice transport through eastern Fram Strait: Evidence from radiogenic isotopes. *Quaternary Science Reviews* 92, 190-207.



Water sampling for
Nd isotopes and REE concentrations:
Fram Strait **Laptev Sea**
○ 2012, ARKXXVII/1 ○ 2013, TRANSDRIFTXXI
● 2014, ARKXXVIII/2 ● 2014, TRANSDRIFTXXII

Results figure 2: Nd concentrations vs. HREE/LREE_{PAAS} ratios in the Laptev Sea. Lena water can be traced by high Nd-concentrations and low HREE/LREE ratios. Water entering the Laptev Sea via Vilkitsky Strait has high HREE/LREE ratios, pointing to LREE removal through scavenging processes.

