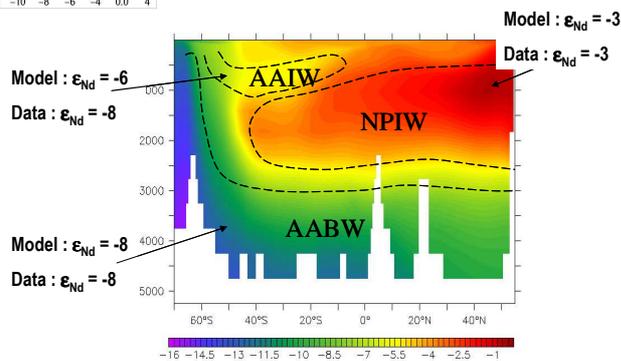
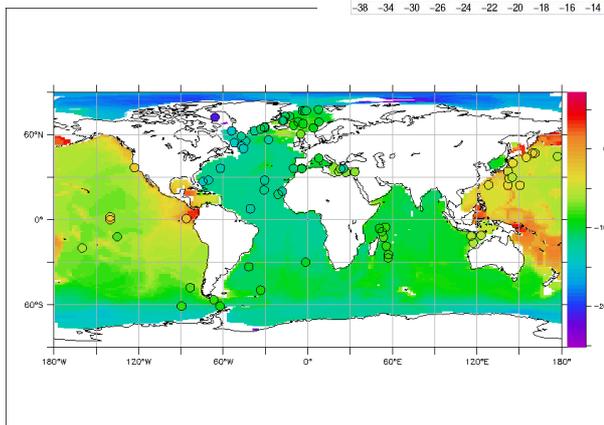
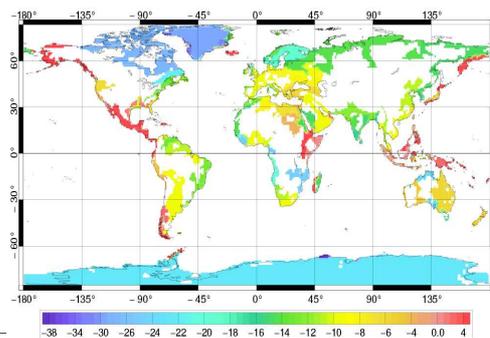


GEOMAR SHEET#9, MARGIN INPUTS: "BOUNDARY EXCHANGE" MODELLING (I)

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Based on the distribution of the ϵ_{Nd} along the world ocean margins established by Jeandel et al (2007), Arsouze et al, (2007) proposed a first simple modelling of the seawater ϵ_{Nd} distribution, modelling the source and sink of Nd as a relaxing term at the margin into the Global Circulation Model (GCM) ORCA 2. The idea was to test the importance of BE in controlling the oceanic cycle. His best simulation suggests rates of exchange between the margins and the seawater of less than 1 year at the surface, reaching 10 years at depth. The same model applied to the North Atlantic using NATL4 confirmed that BE is an important term for the Nd cycle, with exchange rates even shorter than at global scales. Finally, LGM simulations underlined the need for ϵ_{Nd} data in the W- Atlantic during the LGM.



The upper figure proposes a map of the ϵ_{Nd} distribution along the world oceanic margin. This interpolation results from the interpolation of more than 120 data points extracted from the literature (Jeandel et al, 2007). The bottom figures compare the simulated ϵ_{Nd} (back colours) with the data (coloured circles) for deep waters (800-5000 m, left). This simulation corresponds to exchange rates of 1 y in the surface waters and 10 y in the deep ones. The inter ocean ϵ_{Nd} gradient is satisfyingly reproduced (left) as well as the main values of the Pacific water masses as shown by the north-south section (right)

Supprimé :

-Jeandel C., Arsouze T., Lacan F., Téchiné P. and Dutay J.-C. Isotopic Nd compositions and concentrations of the lithogenic inputs into the ocean: a compilation, with an emphasis on the margins. *Chemical Geology*, 239, 156-164, 2007. doi:10.1016/j.chemgeo.2006.11.013

- Arsouze T., Dutay J.-C., Lacan F. and Jeandel C. Modelling the Neodymium isotopic composition with a global circulation model *Chemical Geology*, 239, 165-177, 2007 doi:10.1016/j.chemgeo.2006.12.006

Arsouze T., Dutay J.-C., Kageyama M., **Lacan F.**, Alkama R., Marti O., **Jeandel C.** (2008) Influence of the Atlantic meridional overturning circulation on neodymium isotopic composition at the Last Glacial Maximum, a modelling sensitivity study *Climate of the Past* 4, 191-203.