Modern and Holocene hydrological variations of the NE Atlantic inferred from Nd isotopic composition analyzed on seawater and deep-sea corals

C. COLIN[1*], L. BONNEAU [1], Q. DUBOIS-DAUPHIN[1], E. PONS-BRANCHU[2], E. DOUVILLE[2], N. TISNERAT-LABORDE[2], M. ELLIOT[3], M. DOUARIN[3], F. MIENIS[4], N. FRANK[5], D. SWINGEDOUW[6], F. EYNAUD[6]

[1]Laboratoire GEOPS, Université de Paris-Sud, Université Paris-Saclay, France ([*]correspondence: christophe.colin@u-psud.fr)
[2]LSCE/IPSL, CEA-CNRS-UVSQ, Université Paris-Saclay, F-91191 Gif-sur-Yvette, France
[3]LPGNantes, Université de Nantes, France
[4]Royal Netherlands Institute for Sea Research (NIOZ), Den Burg, Netherlands
[5]Universität Heidelberg, Im Neuenheimer Feld 229, 69120 Heidelberg, Germany
[6]EPOC, UMR CNRS 5805, Université de Bordeaux, France

The North Atlantic plays a major role in the European climate via the Atlantic Meridional Overturning Circulation (AMOC) that is intimately tied to the salt and heat budget in the north Atlantic gyres. The strength of the subpolar gyre as well as the northern limit of MSW and subtropical waters are important components of mid-latitude Atlantic climate variability that are in turn linked to the atmospheric circulation and freshwater fluxes from the Arctic. However, little is known about the sensitivity of the gyres and boundary currents to wind stress and freshwater perturbations over long time-scale such as the Holocene. HAMOC (Holocene North Atlantic Gyres and Mediterranean Overturning dynamic through Climate Changes) is an integrated multidisciplinary climate research project that take up the challenges of improving present knowledge of the AMOC variability and links with the Mediterranean outflow during the Holocene. Here, we present a new set of εNd data obtained on seawater and precisely dated cold-water corals (U/Th dating) collected in the NE Atlantic to reconstruct the re-circulation of water occurs through basin scale, gyres circulations and boundary currents at surface and at mid-depth. More particularly, we will show the interest to use εNd proxy to reconstruct the eastward extension and strength of the subpolar gyre water as well as the northern limit of MSW and subtropical gyre waters in the NE Atlantic.