Geophysical Research Abstracts, Vol. 9, 07365, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-07365

Radiocarbon as a tracer of strength of gyres in the Northeast Atlantic

N. Tisnérat-Laborde (1), M. Paterne (1) and B. Métivier (2).

(1) Laboratoire des Sciences du Climat et de l'Environnement (LSCE/IPSL), CEA-CNRS-UVSQ, avenue de la Terrasse, F-91198 Gif-sur-Yvette, France, (2) Muséum National d'Histoire Naturelle, Département Milieux et Peuplements Aquatiques, USM 0401, UMR- CNRS BOME, 55 rue Buffon, 75005 Paris, France (tisnerat@lsce.cnrs-gif.fr / Fax: +33 1 69 82 35 68 / Phone: +33 1 69 82 35 13)

The northward transport of warm subtropical waters from low to high latitudes in the North Atlantic has a strong influence on European Climate. This transport of warm waters by the Gulf Stream is balanced by the relative strength of the subtropical and subpolar North Atlantic gyres. Here, we investigate, during the last 40 years, the variability of radiocarbon in the North Atlantic which reflects changes of advection and mixing of water masses and air-sea exchange. We present the first quasi-annual radiocarbon time series from the Northeast Atlantic Ocean obtained from new ^{14}C measurements of mollusk shells, selected from the collection of the Muséum National d'Histoire Naturelle de Paris and from synoptic hydrographic surveys. This time series reveals that observed variability of ^{14}C is correlated with changes in North Atlantic oceanography and reflects the dynamic of the North Atlantic gyres circulation. Between 1972 and 1986, we show that the strengthening of the subpolar gyre has impacted the surface circulation of the subtropical gyre.