Geophysical Research Abstracts, Vol. 7, 06134, 2005
SRef-ID: 1607-7962/gra/EGU05-A-06134


# 1 Comparison of tracer distributions in the North Atlantic between 1981 and 2004.

T. Tanhua (1), D.W.R. Wallace (1), J.B. Bullister (2).

(1) Department of Marine Chemistry, Leibniz Institute of Marine Sciences at Kiel University, Germany

(2) National Oceanic and Atmospheric Administration, Pacific Marine Environmental Laboratory, Seattle, WA, USA.

During one leg of the Transient Tracers in the Ocean, North Atlantic Study (TTO-NAS) experiment in 1981, some of the first oceanic CFC-12 and CFC-11 transient tracer data were gathered in the western North Atlantic. Ten of these stations were revisited in early 2004 by the German research vessel Meteor, and the transient tracers CFC-12, CFC-11, $CCl_4$ and $SF_6$ were measured. Tracer data from both experiments will be presented and a comparison will be made. From the comparison it is evident that the apparent ages calculated form the tracer data differ significantly between the two experiments, and that that difference to large extent is inherently due to the limited length of presence of the tracers in the atmosphere in comparison to the true ventilation age of water. Large difference in apparent tracer ages that are simply due to time of sampling have important implications for the interpretation of tracer data and will for instance impact calculations of oceanic uptake of $CO_2$ that relies on calculations of apparent ages. The $SF_6$ data from 2004 show similar trends and age distributions as the CFC-12 data from 1981, apparently dependent on the atmospheric history of CFC-12 as seen in 1981 being similar to the atmospheric history of $SF_6$ in the year 2004.

In the study area a significant intrusion of recently ventilated Labrador Sea Water is a dominant feature that is not present in the TTO-NAS data-set, and thus constitutes a change in the local hydrography.