

Author's Accepted Manuscript

Interannual to decadal oxygen variability in the mid-depth water masses of the eastern North Atlantic

Ilaria Stendardo, Dagmar Kieke, Monika Rhein, Nicolas Gruber, Reiner Steinfeldt



www.elsevier.com/locate/dsr

PII: S0967-0637(14)00192-7
DOI: <http://dx.doi.org/10.1016/j.dsr.2014.10.009>
Reference: DSRI2412

To appear in: *Deep-Sea Research I*

Received date: 3 July 2014
Revised date: 10 October 2014
Accepted date: 29 October 2014

Cite this article as: Ilaria Stendardo, Dagmar Kieke, Monika Rhein, Nicolas Gruber, Reiner Steinfeldt, Interannual to decadal oxygen variability in the mid-depth water masses of the eastern North Atlantic, *Deep-Sea Research I*, <http://dx.doi.org/10.1016/j.dsr.2014.10.009>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Interannual to decadal oxygen variability in the mid-depth water masses of the eastern North Atlantic.

Ilaria Stendardo^{1,2}, Dagmar Kieke¹, Monika Rhein¹, Nicolas Gruber², Reiner Steinfeldt¹

¹Institut für Umweltphysik, Abt. Ozeanographie, Universität Bremen, Bremen, Germany.

²Environmental Physics, Institute of Biogeochemistry and Pollutant Dynamics, ETH Zurich, Switzerland.

Corresponding author: Ilaria Stendardo, Institut für Umweltphysik, Abt. Ozeanographie, Universität Bremen, Bremen, Germany (ilaria.stendardo@uni-bremen.de).

Abstract

The detection of multi-decadal trends in the oceanic oxygen content and its possible attribution to global warming is protracted by the presence of a substantial amount of interannual to decadal variability, which hitherto is poorly known and characterized. Here we address this gap by studying interannual to decadal changes of the oxygen concentration in the Subpolar Mode Water (SPMW), the Intermediate Water (IW) and the Mediterranean Outflow Water (MOW) in the eastern North Atlantic. We use data from a hydrographic section located in the eastern North Atlantic at about 48°N repeated 12 times over a period of 19 years from 1993 through 2011, with a nearly annual resolution up to 2005. Despite a substantial amount of year-to-year variability, we observe a long-term decrease in the oxygen concentration of all three water masses, with the largest changes occurring from 1993 to 2002. During that time period, the trends were mainly caused by a contraction of the subpolar gyre associated with a northwestward shift of the Subpolar Front (SPF) in the eastern North Atlantic. This caused SPMW to be ventilated at lighter

Download English Version:

<https://daneshyari.com/en/article/6383576>

Download Persian Version:

<https://daneshyari.com/article/6383576>

[Daneshyari.com](https://daneshyari.com)