Air-borne dust fluxes to a deep water sediment trap in the Sargasso Sea

T. D. Jickells,1 S. Dorling,1 W. G. Deuser,2 T. M. Church,3 R Arimoto,4,5 and J. M. Prospero6

Abstract. The record of atmospheric dust deposition as recorded by a deep sea sediment trap in the Sargasso Sea is presented. The record is shown to be consistent with the limited available data on directly measured atmospheric dust loadings. The seasonality of the sediment trap dust flux is different from that of the atmospheric deposition as a result of seasonal biological cycles in the surface water. On the longer term the sediment trap dust flux undergoes quite large variations in the annual average flux from 3.6 to 9.4 mg m$^{-2}$ d$^{-1}$. These variations are shown to reflect changes in atmospheric transport efficiency from source regions in North Africa rather than changes in the strength of the dust source in that region. The changes in the dust inputs to this area of the Sargasso Sea appear not to have changed the flux of carbon reaching the deep water, and the implications of this are discussed.

1 School of Environmental Sciences, University of East Anglia, Norwicb.
2Woods Hole Oceanographic Institution, Woods Hole, Massachusetts.
3College of Marine Studies, University of Delaware, Newark.
4Graduate School of Oceanography, University of Rhode Island, Narragansett.
5Now at Carlsbad Environmental and Monitoring Center, New Mexico State University, Carlsbad.
6Rosenstiel School of Marine and Atmospheric Science, University of Miami, Miami, Florida.

Copyright 1998 by the American Geophysical Union.

Paper number 97GB03368.
0886-6236/98/97GB-o3 368$ 12.00