

Particulate silver flux in the Western Arabian Sea: The link to marine productivity

KELLY M. FLANNERY¹ AND JENNIFER L. MCKAY^{2,*}

¹CEOAS, Oregon State University, Corvallis, Oregon, USA
(flannerk@onid.oregonstate.edu)

²CEOAS, Oregon State University, Corvallis, Oregon, USA
(*correspondence: mckay@coas.oregonstate.edu)

It has been suggested that Ag is scavenged by organic-rich particles as they settle through the water column and therefore its concentration in marine sediments maybe linked to productivity [1]. In the present study, we examine Ag concentration and flux data for sediment trap samples from 3 moorings deployed in the Western Arabian Sea during the US-JGOFS Arabian Sea Process Study. Two of the moorings (MS2 and MS3) were located in the divergent zone 263 km and 349 km off the Omani coast, respectively. The third mooring (MS5) was located at an oligotrophic site 1286 km off the Omani coast. Silver flux data are compared to the fluxes of particulate Cd [this study] and biogenic materials [2]. The primary objectives are: i) to determine if Ag is scavenged by sinking particles, and ii) to ascertain whether or not the flux of particulate Ag is related to changes in productivity.

Particulate Ag flux increases with increasing water depth at MS2 and MS3, but decreases slightly at MS5. This contrasts with the particulate Cd flux which decreases with depth at all sites. Silver flux positively correlates with the organic carbon (Corg) flux at all sites and all water depths, but the Ag/Corg ratio varies. At MS2 and MS3 this ratio increases with water depth, while at MS5 it remains relatively constant. The fluxes of Cd and Corg also positively correlate; however, the Cd/Corg ratio does not vary like that of Ag/Corg. The increase in the Ag/Corg ratio with depth at MS2 and MS3 is the result of Corg degradation, as well as Ag scavenging. In contrast, at MS5 no Ag scavenging is occurring, but the positive correlation between Corg and Ag remains. We hypothesize a small amount of Ag is associated with Corg; much like Cd is. During the Northeast monsoon, there is a clear relationship between higher Ag flux and higher fluxes of biogenic materials suggesting the flux of particulate Ag maybe related to productivity.

[1] McKay, J.L. & Pedersen, T.F. (2008). *Global Biogeochem. Cycles*, **22**, doi:10.1029/2007GB003136. [2] Honjo, S., Dymond, J., Prell, W., & Ittekkot, V. (1999). *Deep-Sea Res. II*, **46**, 1859-1902.