Contribution of resuspended particles to the sediments at IMAGES coring sites in the Pacific

H. KAWAHATA[2] K. MINOSHIMA[1] Y. ISHIZAKI[3]

K. YAMAOKA[3] AND L.P. GUPTA[1]

[1] Geological Survey of Japan, AIST, Higashi, Tsukuba 305-8567 Japan; kayo.minosima@aist.go.jp; gupta.lp@aist.go.jp

[2] Graduate School of Frontier Sciences, University of Tokyo, Nakano, Tokyo 164-8639 Japan; kawahata@ori.u-tokyo.ac.jp

[3] Graduate School of Science, Tohoku University, Aoba, Sendai, 980-8578, Japan; y.ishizaki@aist.go.jp; k.yamaoka@aist.go.jp

Sediment trap experiments were conducted at two IMAGES coring sites in the northwestern Pacific in order to better understand the relationship between settling and sedimentary particles and its implication to reconstruction of paleo-environments. Lithogenics were generally the major component of settling particles followed by biogenic opal (silica). Both contributed ~70 % of the total mass flux. At Site Shimokita, high lithogenic flux was associated with significant contribution of particles resuspended from the relatively shallow seafloor, which is affected by high intensity of the Tsugaru Current. Relatively good correlation of lithogenics with carbonate and biogenic opal suggested that resuspended material contributed partly to carbonate and biogenic opal flux. Total mass and lithogenics showed flux profiles different from that of organic matter (OM). The total hydrolysable amino acids (THAA) and hexosamines (THHA), the labile organic compounds, were well correlated with OM in content, which suggested that OM, reflecting primary production, is directly transported from the surface ocean to the seafloor sediments. Flux-corrected mean alkenone temperature of 13.8˚C was comparable to that (15.7˚C) measured in the surface sediments, which is consistent with the modern mean temperature of 15.9˚C in the surface ocean (20-30 m) in July - August at Site Shimokita. At Site Kashima, alkenone temperature estimated from the settling particles and surface sediments gave the same value (17.2˚C). Accumulation rates of biogenic opal and lithogenics in the surface sediments were much higher than those recorded by sediment traps by ~200% and ~510%, respectively, while those of carbonate and OM were lower by ~22% and ~74%, respectively. These results imply that lithogenics are much affected by resuspended particles and bring some bias to the environmental record, especially those obtained from high sedimentation rate areas (e.g. IMAGES core sites).