Geophysical Research Abstracts,
Vol. 11, EGU2009-3542, 2009
EGU General Assembly 2009

The Effects of Nutrient Ratios on Phytoplankton in the East China Sea: Based on Data of Field Observation and a Sediment Core

H. Jin, J. Chen, H. Li, K. Wang, Y. Lu, and W. Wang

Laboratory of Marine Ecosystem and Biogeochemsitry, Second Institute of Oceanography, SOA, Hangzhou 310012, P R China (jinhaisio@hotmail.com)

The East China Sea is one of the largest shelf marginal seas in the world. Changjiang, the biggest river of China discharge 9×10^{11}m^3 water and 4.86×10^{8}t suspended particles per year into the East China Sea. Higher and higher nutrient loadings lead to more and more serious eutrophication and red tide events. During a comprehensive cruise in summer 2006, nutrients and HPLC-derived pigments were analyzed in a section from the Changjiang Estuary across the continental shelf along the latitude of 31˚N, in order to study how nutrients concentrations and ratios affect on the structure of phytoplankton community. “Chemtax” software was used to obtain the community structure of phytoplankton at class level based on pigments data. The community structure of phytoplankton was different between the west and East of 123.5˚E. In the Estuary water dominated west part where silicate and nitrate were very abundant and N/P ratio was higher than 16, phytoplankton biomass was high and the communities were dominated by diatoms through the whole water column. In contrast, in the shelf water dominated east part, the nutrient concentrations were very low, and N/P ratio was lower than the Redfield ratio 16, the phytoplankton biomass was low and the community was mainly composed of cyanobacteria in surface layer. Analysis of organic carbon δ^{13}C ($\delta^{13}C_{org}$), opal, sediment pigments from a sediment core revealed that $\delta^{13}C_{org}$ values ranged from -26.15‰ to -19.5‰ suggesting the mixing organic carbon sources of riverine and marine organisms. Opal and diatom microscope identifying data suggested that the biogenic silica and diatom production was low before 1950s and increased from 1950s to 1980s. After 1980s the diatom production decreased while the production of other phytoplankton communities such as dinoflagellate increased. These sediment records correspond to the facts that nutrient input from the Changjiang has been dramatically increasing about three-five fold since the 1960s and N/P, N/Si ratio were increased at the Changjiang River Estuary since the last 40 years.