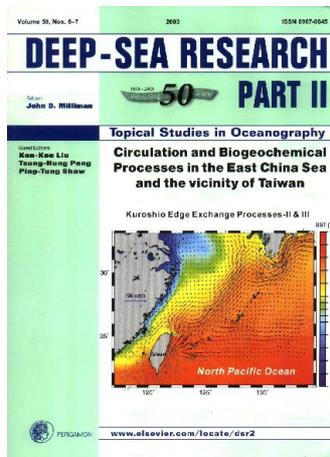


Deep Sea Research II, 50(6-7), 2003

Circulation & biogeochemical processes in the East China Sea and the vicinity of Taiwan

Kon-Kee Liu, Tsung-Hung Peng and Ping-Tung Shaw



The East China Sea shelf (including the Yellow Sea and the Bohai Sea) is a very challenging system for hydrodynamic and biogeochemical studies due to its complicated physical and chemical forcing. It receives much attention because of its capacity for absorbing atmospheric CO₂ in spite of large riverine fluxes of terrigenous carbon. This volume reports field observations and modeling studies during the Kuroshio Edge Exchange Processes (KEEP) and ensuing projects, which are a part of the continental margins study in the Joint Global Ocean Flux Study (JGOFS). A 3-D numerical model has been developed to simulate the climatological circulation in the East China Sea. The model result is supported by observations in the seas around Taiwan. The significance of inflow from the Taiwan Strait is emphasized. Geochemical tracers prove useful in understanding the water and material transport.

Biogeochemical studies suggest very efficient recycling of organic carbon by bacterial and protozoan consumption in the shelf water, but a finite amount of particulate organic carbon with a significant terrigenous fraction is exported from the shelf. The fine-grained sediments in the inner shelf appear to be an important source of organic carbon for export. Future studies are needed to improve our understanding of key physical and biogeochemical processes, to develop coupled physical–biogeochemical models, and to catch and survey the elusive spring algal bloom. A tantalizing goal of our ongoing effort is to document or even to predict future changes in the East China Sea shelf caused by the operation of the Three-Gorge Dam, which is under construction in the middle reach of the Yangtze River.

Kon-Kee Liu, Tsung-Hung Peng, Ping-Tung Shaw and Fuh-Kwo Shiah -- Circulation and biogeochemical processes in the East China Sea and the vicinity of Taiwan: an overview and a brief synthesis -- 1055-1064

Hung-Jen Lee and Shenn-Yu Chao -- A climatological description of circulation in and around the East China Sea -- 1065-1084

W. -D. Liang, T. Y. Tang, Y. J. Yang, M. T. Ko and W. -S. Chuang -- Upper-ocean currents around Taiwan -- 1085-1105

Ruo-Shan Tseng and Yung-Ting Shen -- Lagrangian observations of surface flow patterns in the vicinity of Taiwan -- 1107-1115

Sen Jan and Shenn-Yu Chao -- Seasonal variation of volume transport in the major inflow region of the Taiwan Strait: the Penghu Channel -- 1117-1126

J. -J. Hung, C. -H. Chen, G. -C. Gong, D. -D. Sheu and F. -K. Shiah -- Distributions, stoichiometric patterns and cross-shelf exports of dissolved organic matter in the East China Sea -- 1127-1145

George T. F. Wong and Ling-Su Zhang -- Geochemical dynamics of iodine in marginal seas: the southern East China Sea -- 1147-1162

Y. Chung, K. Chung, H. C. Chang, L. W. Wang, C. M. Yu and G. W. Hung -- Variabilities of particulate flux and ^{210}Pb in the southern East China Sea and western South Okinawa Trough -- 1163-1178

Woei-Lih Jeng, Saulwood Lin and Shuh-Ji Kao -- Distribution of terrigenous lipids in marine sediments off northeastern Taiwan -- 1179-1201

S. J. Kao, F. J. Lin and K. K. Liu -- Organic carbon and nitrogen contents and their isotopic compositions in surficial sediments from the East China Sea shelf and the southern Okinawa Trough -- 1203-1217

Gwo-Ching Gong, Yun-Ho Wen, Bo-Wen Wang and Gong-Jen Liu -- Seasonal variation of chlorophyll a concentration, primary production and environmental conditions in the subtropical East China Sea -- 1219-1236

Jeng Chang, Fuh-Kwo Shiah, Gwo-Ching Gong and Kuo Ping Chiang -- Cross-shelf variation in carbon-to-chlorophyll a ratios in the East China Sea, summer 1998 -- 1237-1247

Yuh-Ling Lee Chen and Houng-Yung Chen -- Nitrate-based new production and its relationship to primary production and chemical hydrography in spring and fall in the East China Sea -- 1249-1264

Jeng Chang, Keng-Hsien Lin, Kung-Ming Chen, Gwo-Ching Gong and Kuo-Ping Chiang -- *Synechococcus* growth and mortality rates in the East China Sea: range of variations and correlation with environmental factors -- 1265-1278

Kuo-Ping Chiang, Chiu-Yi Lin, Chung-Hsien Lee, Fuh-Kwo Shiah and Jeng Chang -- The coupling of oligotrich ciliate populations and hydrography in the East China Sea: spatial and temporal variations -- 1279-1293

Fuh-Kwo Shiah, Gwo-Ching Gong and Chung-Chi Chen -- Seasonal and spatial variation of bacterial production in the continental shelf of the East China Sea: possible controlling mechanisms and potential roles in carbon cycling -- 1295-1309

Chung-Chi Chen, Fuh-Kwo Shiah, Gwo-Ching Gong and Kuo-Ping Chiang -- Planktonic community respiration in the East China Sea: importance of microbial consumption of organic carbon -- 1311-1325

Chen-Tung Arthur Chen -- New vs. export production on the continental shelf -- 1327-1333