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The Equatorial Pacific JGOFS Synthesis
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At the JGOFS (Joint Global Ocean Flux Study) Pacific Planning Workshop held in Honolulu in September 1989, the Working Group on the Equatorial Pacific proposed three questions to be addressed as the basis for an Equatorial Pacific JGOFS Programme (JGOFS, 1989). The three questions were: (i) Does the equatorial Pacific biogeochemical cycling determine what happens in the global ocean; (ii) What is the capacity of the biological pump in the equatorial Pacific; (iii) What is the response of the equatorial Pacific to ENSO fluctuations? It was further suggested that the timing was right due to the wealth of physical oceanographic data that had been recently collected by the TOGA (Tropical Ocean Global Atmosphere) project and the complementary data and oceanographic insights that would be gained from the TOGA-COARE (Coupled Ocean-Atmosphere Response Experiment) programme. A decade later, we now know that the timing was extremely fortunate, not only because of the range of ENSO fluctuations that we experienced during the 1990s but also because of the many improvements in technology that have occurred (e.g., Bricaud et al., 2002). We now routinely measure and characterize picoplankton, photosynthetic and carotenoid pigments, trace elements, and inorganic carbon species at concentrations and sensitivities that could not have been imagined during the planning stages. In 2002, we look at what we have learned, what we need to study, and, in particular, whether we are closer to answering the three questions above. We use results previously published in three volumes of Deep-Sea Research II and the present volume, which presents synthetic papers and some new results originating from recent cruises (other papers published in various journals will be used also in this synthesis).

Robert Le Borgne, Richard A. Feely and Denis J. Mackey -- Carbon fluxes in the equatorial Pacific: a synthesis of the JGOFS programme -- 2425-2442

Richard A. Feely et al. -- Seasonal and interannual variability of CO₂ in the equatorial Pacific -- 2443-2469

Robert Le Borgne et al. -- Pacific warm pool and divergence: temporal and zonal variations on the equator and their effects on the biological pump -- 2471-2512

R.C. Dugdale et al. -- Meridional asymmetry of source nutrients to the equatorial Pacific upwelling ecosystem and its potential impact on ocean-atmosphere CO₂ flux; a data and modeling approach -- 2513-2531

Charles R. McClain et al. -- Satellite ocean-color observations of the tropical Pacific Ocean -- 2533-2560

D.J. Mackey, J. Blanchot, H.W. Higgins and J. Neveux -- Phytoplankton abundances and community structure in the equatorial Pacific -- 2561-2582

A. Bricaud, C.S. Roesler, J.S. Parslow and J. Ishizaka -- Bio-optical studies during the JGOFS-equatorial Pacific program: a contribution to the knowledge of the equatorial system -- 2583-2599

Brian J. Binder and Michele D. DuRand -- Diel cycles in surface waters of the equatorial Pacific -- 2601-2617

Anthony K. Aufdenkampe et al. -- Biogeochemical controls on new production in the tropical Pacific -- 2619-2648

Anthony K. Aufdenkampe and James W. Murray -- Controls on new production: the role of iron and physical processes -- 2649-2668

Michael R. Landry and David L. Kirchman -- Microbial community structure and variability in the tropical Pacific -- 2669-2693

M.R. Roman, H.G. Dam, R. Le Borgne and X. Zhang -- Latitudinal comparisons of equatorial Pacific zooplankton -- 2695-2711

F. Chai, R.C. Dugdale, T.-H. Peng, F.P. Wilkerson and R.T. Barber -- One-dimensional ecosystem model of the equatorial Pacific upwelling system. Part I: model development and silicon and nitrogen cycle -- 2713-2745

R.C. Dugdale, R.T. Barber, F. Chai, T.-H. Peng and F.P. Wilkerson -- One-dimensional ecosystem model of the equatorial Pacific upwelling system. Part II: sensitivity analysis and comparison with JGOFS EqPac data -- 2747-2768

Lallan Prasad Gupta and Hodaka Kawahata -- Impact of ENSO variability on the flux and composition of sinking POM in the western equatorial Pacific Ocean: Amino acids and hexosamines -- 2769-2782

Hodaka Kawahata, Akira Nishimura and Michael K. Gagan -- Seasonal change in foraminiferal production in the western equatorial Pacific warm pool: evidence from sediment trap experiments -- 2783-2800

F. Kobayashi and K. Takahashi -- Distribution of diatoms along the equatorial transect in the western and central Pacific during the 1999 La Niña conditions -- 2801-2821

Hitoshi Yamashita, Kozo Takahashi and Naoki Fujitani -- Zonal and vertical distribution of radiolarians in the western and central Equatorial Pacific in January 1999 -- 2823-2862