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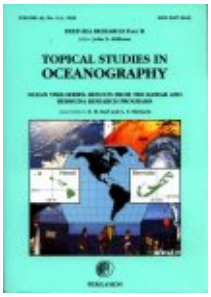
Ocean Time Series: Results from the Hawaii and Bermuda Research Programs, Guest Edited by D.M. Karl and A.F. Michaels



It's About Time (Series)!

In spite of their recognized importance, systematic, long-term biogeochemical observations of oceanic habitats are rare. In response to a growing awareness of the ocean's role in climate and global change, and the need for comprehensive oceanic time-series measurements, the International Geosphere-Biosphere Programme: A Study of Global Change (IGBP) was established in 1986. One of the essential core components of this program, the Joint Global Ocean Flux Study (JGOFS) was established in 1987 to improve our understanding of the oceanic carbon cycle and to quantify the exchanges of carbon with the atmosphere, the seafloor and the continental boundaries. To achieve these goals, this international program established four field elements: (1) process studies to capture key, regular events, (2) time-series observations at strategic sites, (3) a global inventory of CO_2, and (4) vigorous data assimilation modelling efforts. In 1988, the U.S. National Science Foundation funded the establishment of time-series stations in the North Atlantic Ocean near Bermuda and in the North Pacific Ocean near Hawaii under JGOFS auspices. Since that time, nearly 200 research cruises have been conducted providing an unprecedented view of physical and biogeochemical variability at these two oceanic benchmarks. As of 1995, there were at least three other JGOFS time-series studies in progress: A French effort at Kerguelen Island in the southern Indian Ocean, a joint German-Spanish measurement program in the eastern North Atlantic Ocean near the Canary Islands, and a joint German-Chilean station in the eastern South Pacific Ocean off the coast of Chile. Several additional ocean time-series research efforts conducted outside the context of the IGBP-JGOFS programs are also underway, but few have the physical-biogeochemical focus of the Hawaii Ocean Time-series (HOT) and Bermuda Atlantic Time-series Study (BATS). Collectively, these oceanic time-series research efforts have provided an unprecedented view of oceanic variability on a variety of time scales from days to decades.

This issue provides detailed information on the design and initial implementation of the BATS and HOT research programs. Included are papers on seasonal cycles in hydrography, currents, primary production and particle flux, analyses of nutrient dynamics and the chemical controls on plankton standing stocks, and presentations of the results of coupled physical-biological and data assimilation models.