



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 CO₂, 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.

David M. Karl and Roger Lukas -- The Hawaii Ocean Time-series (HOT) program: Background, rationale and field implementation -- 129-156

Anthony F. Michaels and Anthony H. Knap -- Overview of the U.S. JGOFS Bermuda Atlantic Time-series Study and the Hydrostation S program -- 157-198

Frederick M. Bingham and Roger Lukas -- Seasonal cycles of temperature, salinity and dissolved oxygen observed in the Hawaii Ocean Time-series -- 199-213

Sean C. Kennan and Roger Lukas -- Saline intrusions in the intermediate waters north of Oahu, Hawaii -- 215-241

Roger Lukas and Fernando Santiago-Mandujano -- Interannual variability of Pacific deep- and bottom-waters observed in the Hawaii Ocean Time-series -- 243-255

Gary T. Mitchum -- On using satellite altimetric heights to provide a spatial context for the Hawaii Ocean Time-series measurements -- 257-280

Eric Firing -- Currents observed north of Oahu during the first five years of HOT -- 281-303

Stephen M. Chiswell -- Intra-annual oscillations at Station ALOHA, north of Oahu, Hawaii -- 305-319

Anthony F. Michaels and David A. Siegel -- Quantification of non-algal light attenuation in the Sargasso Sea: Implications for biogeochemistry and remote sensing -- 321-345

Nicholas R. Bates, Anthony F. Michaels and Anthony H. Knap -- Seasonal and interannual variability of oceanic carbon dioxide species at the U.S. JGOFS Bermuda Atlantic Time-series Study (BATS) site -- 347-383

John E. Dore and David M. Karl -- Nitrite distributions and dynamics at Station ALOHA -- 385-402

F. Lipschultz, O. C. Zafiriou and L. A. Ball -- Seasonal fluctuations of nitrite concentrations in the deep oligotrophic ocean -- 403-419

- Nathalie A. D. Waser, Michael P. Bacon and Anthony F. Michaels -- Natural activities of ^{32}P and ^{33}P and the $^{33}\text{P}/^{32}\text{P}$ ratio in suspended particulate matter and plankton in the Sargasso Sea -- 421-436
- Mark A. Brzezinski and David M. Nelson -- Chronic substrate limitation of silicic acid uptake rates in the western Sargasso Sea -- 437-453
- M. L. A. M. Campos, A. M. Farrenkopf, T. D. Jickells and G. W. Luther III -- A comparison of dissolved iodine cycling at the Bermuda Atlantic Time-series Station and Hawaii Ocean Time-series Station -- 455-466
- R. M. Letelier, J. E. Dore, C. D. Winn and D. M. Karl -- Seasonal and interannual variations in photosynthetic carbon assimilation at Station ALOHA -- 467-490
- Thomas D. Sleeter, Craig A. Carlson and Hugh W. Ducklow -- Stocks and dynamics of bacterioplankton in the northwestern Sargasso Sea -- 491-515
- Robert A. Andersen, Robert R. Bidigare, Maureen D. Keller and Mikel Latasa -- A comparison of HPLC pigment signatures and electron microscopic observations for oligotrophic waters of the North Atlantic and Pacific Oceans -- 517-537
- D. M. Karl et al. -- Seasonal and interannual variability in primary production and particle flux at Station ALOHA -- 539-568
- Rebecca Schudlich and Steven Emerson -- Gas supersaturation in the surface ocean: The roles of heat flux, gas exchange, and bubbles -- 569-589
- Scott C. Doney, David M. Glover and Raymond G. Najjar -- A new coupled, one-dimensional biological-physical model for the upper ocean: Applications to the JGOFS -- Bermuda Atlantic Time-series Study (BATS) site -- 591-624
- Linda M. Lawson, Eileen E. Hofmann and Yvette H. Spitz -- Time series sampling and data assimilation in a simple marine ecosystem model -- 625-651
- George C. Hurtt and Robert A. Armstrong -- A pelagic ecosystem model calibrated with BATS data -- 653-683
- J. K. Cochran, D. J. Hirschberg, H. D. Livingston, K. O. Buesseler and R. M. Key -- Natural and anthropogenic radionuclide distributions in the Nansen Basin, Arctic Ocean: Scavenging rates and circulation timescales -- 685-685