



The cruise investigated phytoplankton spring bloom development and its biogeochemical effects in different water masses of the Atlantic sector of the Southern Ocean: the Polar Frontal region, the southern Antarctic Circumpolar Current zone, its boundary with the Weddell Gyre and the marginal ice zone. The relative roles of physical stability, iron limitation and grazing pressure in enhancing or constraining phytoplankton biomass accumulation were examined.

The results obtained during the cruise are presented in detail in the separate papers of this issue. The findings confirm those of other studies in the same field, that frontal regions are major productive sites in the Southern Ocean and that input of meltwater and associated ice algae to the surface layer from a retreating ice edge is by itself an insufficient condition for induction of phytoplankton blooms. Another major finding was the negligible build-up of plankton biomass and concomitant absence of carbon dioxide drawdown associated with seasonal retreat of the ice cover. The results of the cruise suggest that phytoplankton blooms are induced by combinations of factors, and these are summarised in the first paper. A CD-ROM is included which contains the actual database of measured variables as well as various background information on the expedition and the methods and other descriptions directly related to each reported variable.

V. Smetacek, H. J. W. De Baar, U. V. Bathmann, K. Lochte and M. M. Rutgers Van Der Loeff -- Ecology and biogeochemistry of the Antarctic Circumpolar Current during austral spring: a summary of Southern Ocean JGOFS cruise ANT X/6 of R.V. Polarstern -- 1-21

C. Veth, I. Peeken and R. Scharek -- Physical anatomy of fronts and surface waters in the ACC near the 6°W meridian during austral spring 1992 -- 23-49

U. V. Bathmann, R. Scharek, C. Klaas, C. D. Dubischar and V. Smetacek -- Spring development of phytoplankton biomass and composition in major water masses of the Atlantic sector of the Southern Ocean -- 51-67

B. Quéguiner, P. Tréguer, I. Peeken and R. Scharek -- Biogeochemical dynamics and the silicon cycle in the Atlantic sector of the Southern Ocean during austral spring 1992 -- 69-89

D. C. E. Bakker, H. J. W. De Baar and U. V. Bathmann -- Changes of carbon dioxide in surface waters during spring in the Southern Ocean -- 91-127

F. Dehairs et al. -- $\delta^{13}\text{C}$ of Southern Ocean suspended organic matter during spring and early summer: regional and temporal variability -- 129-142

B. M. Löscher, H. J. W. De Baar, J. T. M. De Jong, C. Veth and F. Dehairs -- The distribution of Fe in the Antarctic Circumpolar Current -- 143-187

M. A. Van Leeuwe, R. Scharek, H. J. W. De Baar, J. T. M. De Jong and L. Goeyens -- Iron enrichment experiments in the Southern Ocean: physiological responses of plankton communities -- 189-207

Renate Scharek, Maria A. Van Leeuwe and Hein J. W. De Baar -- Responses of Southern Ocean phytoplankton to the addition of trace metals -- 209-227

H. J. W. De Baar et al. -- Nutrient anomalies in *Fragilariopsis kerguelensis* blooms, iron deficiency and the nitrate/phosphate ratio (A. C. Redfield) of the Antarctic Ocean -- 229-260

Iika Peeken -- Photosynthetic pigment fingerprints as indicators of phytoplankton biomass and development in different water masses of the Southern Ocean during austral spring -- 261-282

D. Meyerdierks, B. Bolt and G. O. Kirst -- Spatial and vertical distribution of particulate dimethylsulphoniopropionate (DMSP) during spring in the Atlantic sector of the Southern Ocean -- 283-297

A. E. Detmer and U. V. Bathmann -- Distribution patterns of autotrophic pico- and nanoplankton and their relative contribution to algal biomass during spring in the Atlantic sector of the Southern Ocean -- 299-320

- Karin Lochte, Peter Koefoed Bjørnsen, Hanna Giesenhausen and Anke Weber -- Bacterial standing stock and production and their relation to phytoplankton in the Southern Ocean -- 321-340
- Paul Kähler, Peter K. Bjørnsen, Karin Lochte and Avan Antia -- Dissolved organic matter and its utilization by bacteria during spring in the Southern Ocean -- 341-353
- S. Becquevort -- Nanoprotozooplankton in the Atlantic sector of the Southern Ocean during early spring: biomass and feeding activities -- 355-373
- Christine Klaas -- Microprotozooplankton distribution and their potential grazing impact in the Antarctic Circumpolar Current -- 375-393
- H. G. Fransz and S. R. Gonzalez -- Latitudinal metazoan plankton zones in the Antarctic Circumpolar Current along 6°W during austral spring 1992 -- 395-414
- Corinna D. Dubischar and Ulrich V. Bathmann -- Grazing impact of copepods and salps on phytoplankton in the Atlantic sector of the Southern Ocean -- 415-433
- Jan A. Van Franeker, Ulrich V. Bathmann and Sylvie Mathot -- Carbon fluxes to Antarctic top predators -- 435-455
- Michiel M. Rutgers Van Der Loeff, Jana Friedrich and Ulrich V. Bathmann -- Carbon export during the Spring Bloom at the Antarctic Polar Front, determined with the natural tracer ^{234}Th -- 457-478
- Richard M. Crawford, Friedel Hinz and Tatiana Rynearson -- Spatial and temporal distribution of assemblages of the diatom *Corethron criophilum* in the Polar Frontal region of the South Atlantic -- 479-496
- F. Dehairs, D. Shopova, S. Ober, C. Veth and L. Goeyens -- Particulate barium stocks and oxygen consumption in the Southern Ocean mesopelagic water column during spring and early summer: relationship with export production -- 497-516
- J. W. Rommets et al. -- The CD-ROM Database of the JGOFS expedition ANT X/6 aboard R.V. Polarstern -- 517-519