404

VARIATIONS IN CHEMICAL AND BIOLOGICAL DISTRIBUTIONS AND PROCESSES IN THE SOUTHERN ROSS SEA: 2000 - 2005

W.O. Smith

Virginia Institute of Marine Sciences, Gloucester Pt., VA, United States

Variations in chemical and biological distributions and processes were studied in the southern Ross Sea during a five-year period (2000 – 2005) to assess the magnitude of the changes, their forcing, and ultimately their influence on regional biogeochemistry and food web dynamics. To assess these variations, a field study was conducted to measure the net community production via nitrogen budgets, as well as net diatom production via silicic acid budgets. Both particulate and dissolved forms were assessed, along with phytoplankton abundance and assemblage composition. Large differences among years were observed in phytoplankton standing stocks and production, and these large-scale variations were controlled by ice concentrations and dynamics. However, more subtle variations were also observed (for example, assemblage composition differences) that could not be easily attributed to physical or chemical impacts. While the generally accepted pattern of assemblage composition in the Ross Sea is for haptophytes to dominate in spring and followed by diatoms, substantial variations occurred in both the absolute magnitude of each component, as well as their relative abundance in time. Indeed, during some years a major, previously undescribed bloom of diatoms was observed in late summer (February) that was at least equal in magnitude to the haptophyte bloom in early spring. We conclude that while the general pattern of phytoplankton growth may hold true for some years, variations from this pattern are significant and may have profound impacts of regional biogeochemistry and food web dynamics. We also suggest that these variations may be linked to the supply of iron to the surface via the introduction of modified circumpolar deep water; hence, the frequency and strength of these intrusions may be critical in controlling surface phytoplankton processes.