The Initial Phase of the SouthEast Asian Time-series Study (SEATS) – Lessons learned and implications

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Abstract

The special issue on the first phase (1999-2003) of the SouthEast Asian Time-series Study (SEATS) is expected to appear in Deep-Sea Research II by the end of this year. A wealth of information on the geochemical behaviors of the northern South China Sea, some unanticipated and some with global implications, has been unearthed in this initial phase of the study. For example, the open northern South China Sea is neither a significant source nor sink of atmospheric CO_2 at the present time. However, the total dissolved CO_2 in the mixed layer has been increasing at about the same rate as those found at the Hawaii Ocean Time-series (HOT) station and the Bermuda Atlantic Time-series Station (BATS). The partial pressure of CO_2 in the mixed layer has also been increasing at a faster rate than that in the atmosphere. If the present trend is sustained, if not now, the northern South China Sea will eventually become a net source of CO_2 to the atmosphere. The biological pump in this region cannot be sustained by diapycnal mixing alone. Nitrogen fixation is supposed to occur but *Trichodesmium* bloom has not been a common occurrence. If the iron needed for nitrogen fixation to take place is atmospherically derived, this source material to the northern South China Sea may be more spatially and temporally variable than once thought. Some of these lessons learned will be highlighted and their implications on future work will be discussed.