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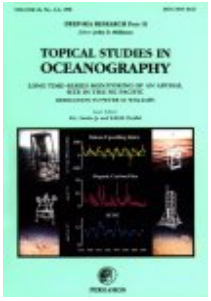
Long time-series monitoring of an abyssal site in the NE Pacific. Dedication to Peter M. Williams, Guest Edited by K.L. Smith, Jr. and E.R.M. Druffel



Abyssal regions of the world ocean cover more than 50% of the Earth's surface but the biogeochemical processes in the sediments and deep water column of this vast expanse are poorly understood. The cycling of organic matter in the deep ocean is difficult to evaluate because synoptic measurements on sufficiently long time scales are rare. The lack of long time-series measurements to examine concurrently the input of a pelagically derived food supply and its impact on benthic boundary layer (BBL) processes prompted us to establish a long-term, abyssal study site in the NE Pacific (Sta. M; 34°50'N, 123°00'W; 4100 m depth) in June 1989. The resulting 7-year study of the BBL at a single site represents the longest continuous time-series study of any abyssal area in the world ocean. We monitored continuously the flux of sinking particulate matter through the BBL and employed time-lapse photography to record dynamic benthic processes. During this same time period, seasonal measurements of particulate, suspended, and dissolved organic and inorganic fractions were made in the water column and in the sediments, and sediment community oxygen consumption was monitored.

This unique data set is described and analyzed in the 14 papers included in this volume. Our studies represent the most detailed long time-series study of any benthic boundary layer in the world ocean.

However, this in-depth analysis has only accentuated the need for increased sampling resolution and a greater diversity of measurements to resolve the cycling of carbon and other nutrients in the deep ocean.

Long time-series studies are essential for resolving such cycles given the high variability on time scales of hours to years.