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TITLE: Marine Primary Production in Relation to Climate Variability and Change

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ABSTRACT:

Marine photosynthetic plankton are responsible for approximately 50 petagrams (10¹⁵) of carbon per year of net primary production, an amount equivalent to that on land. This primary production supports essentially all life in the oceans and profoundly affects global biogeochemical cycles and climate. This review discusses the general distribution of primary production in the sea, the processes that regulate this distribution, and how marine primary production is sensitive to climate variability and change. Statistical modes of ocean variability and their characteristic interannual to multi-decadal timescales over the last century are described. Recent in situ and satellite time-series of primary production can be clearly linked to interannual ocean variability. Global marine primary production appears to have increased over the past several decades in association with multi-decadal variations. A paleoclimate record extends discussion to the centennial scale, providing contrasting insights into how marine primary production might vary in the future.

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