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Annual Primary Production in Narragansett Bay with no Bay- Wide Winter–Spring Phytoplankton Bloom

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Primary production was estimated over the annual cycle from ^{14}C incubations conducted in 5 m deep enclosures and modeled for 16 stations in Narragansett Bay with data from biweekly surveys in which light, chlorophyll, attenuation coefficients and other parameters were measured. Annual values ranged from $160 \text{ g C m}^{-2} \text{ y}^{-1}$ in the lower West Passage to $619 \text{ g C m}^{-2} \text{ y}^{-1}$ at the mouth of the Providence River. The annual bay-wide, area mean fell near the middle of this range at $323 \text{ g C m}^{-2} \text{ y}^{-1}$ and was not apparently different from previous surveys. In the 1998 warm, El Niño winter, no bay-wide winter–spring phytoplankton flowered. Bloom limitation was correlated with warm temperatures which may have stimulated grazing rates. The lack of a bloom did not change annual levels of primary production but this alteration in carbon flow may impact macrofauna in the benthic infauna community.

Keywords

phytoplankton; climate trends; warming; primary production; nutrients; ^{14}C

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