Changes in Phytoplankton Productivity in Lake Erie.

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Phytoplankton productivity has undergone significant declines since the early 1970's due to the combined impacts of phoshphorus control and more recently, zebra mussel invasion. Seasonal rates of areal phytoplankton photosynthesis have declined by as much as 50% in the west and 75% in the east basin. Whole-lake carbon fixation in Lake Erie may now be about equal to Lake Ontario in spite of 30% larger surface area. Consistent application of 14C-incubator methodology has led to development of a valuable database across three ecosystems, Lake Ontario, Bay of Quinte, and Lake Erie. This has led to development of relationships such as chlorophyll and seasonal photosynthesis vs. phosphorus than help asses the performance of the phytoplankton community. Presently, the nearshore east basin is well below the productivity potential set by phosphorus levels while other parts of the lake may not be as impaired. Seasonal (east basin 1998) and lakewide measurements of phosphorus demand and turnover times have also been made.