

Addendum

In a recent issue of *Biogeochemistry*, we published an assessment of the annual mass balances of C, N, and P in Narragansett Bay, Rhode Island (USA) (Nixon et al. 1995). As part of that effort we included an estimate of the primary production by phytoplankton in the bay. Since that article appeared, the relationship between primary production and the input of reactive N shown in Figure 4 of our paper has been revised and brought up to date with recent measurements of ^{14}C uptake made in the Sargasso Sea and the North Central Pacific using "clean techniques" (Nixon et al. in press). The new relationship also includes only systems where an effort was made to account for all sources of reactive N. The revised relationship is described by the functional regression: $\log \text{PP} = 0.442 \log \text{DIN} + 2.332$ with $N = 10$ natural systems plus nine MERL mesocosms and $r^2 = 0.93$. DIN and PP are in units of $\text{moles m}^{-2} \text{y}^{-1}$ and $\text{g C m}^{-2} \text{y}^{-1}$, respectively. Based on the new regression and the DIN values and assumptions discussed in Nixon et al. (1995), the average rate of primary production by the phytoplankton in Narragansett Bay is $273 \text{ g C m}^{-2} \text{y}^{-1}$. If all the DON from sewage treatment plants and 25% of the DON from rivers is considered reactive, the production is increased to $285 \text{ g C m}^{-2} \text{y}^{-1}$. Both values are very close to the estimate of $270 \text{ g C m}^{-2} \text{y}^{-1}$ reported by Oviatt et al. (1981) on the basis of an annual bay-wide survey using oxygen bottle incubations.

The production of $285 \text{ g C m}^{-2} \text{y}^{-1}$ is equivalent to an organic carbon input of $7790 \times 10^6 \text{ moles y}^{-1}$, or 80% of the value calculated earlier. Burial accounts for 2–6% of this production (assuming, as we did in text, that all particulate C inputs from land are also buried), and offshore export amounts to 10–20% of the phytoplankton production. The positive net carbon balance for the bay requires 9–15% of the net carbon fixation by the phytoplankton.

References

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- Oviatt CO, Buckley B & Nixon SW (1981) Annual phytoplankton metabolism in Narragansett Bay calculated from survey field measurements and microcosm observations. *Estuaries* 4(3): 167–175