



## Seasonal and annual variability in the spatial patterns of plankton biomass in Chesapeake Bay

Roman, M., X. Zhang, C. McGilliard, W. Boicourt

Limnol. Oceanogr., 50(2), 2005, 480-492 | DOI: 10.4319/lo.2005.50.2.0480

**ABSTRACT:** We conducted high-resolution, underway sampling in April, July, and October for 6 yr (1995-2000) in the large estuary, Chesapeake Bay. This period included climatological extremes in freshwater inputs that strongly influenced both the overall stocks and spatial distribution of phytoplankton and zooplankton. Higher biomass of both phytoplankton and zooplankton occurred in springs, when freshwater input into Chesapeake Bay was above the average discharge. While whole-Bay productivity appears to be influenced by freshwater flow variability, mesoscale patterns in plankton biomass are driven by freshwater inputs, circulation, and bathymetry. Persistent maxima in plankton biomass occurred in areas of physical and topographic discontinuities such as the upper-Bay salt front, plume fronts, the hydraulic control region, tidal fronts, and near a topographically induced eddy. Although the contribution of these hot spots to the whole-Bay standing stock of plankton may vary due to changes in the background levels of plankton, controlled in part by freshwater discharge, they nevertheless represent predictable areas of higher forage for planktivorous fish. Enhanced trophic coupling between plankton and fish at these physical discontinuities may be one reason why estuaries have higher fisheries yields in relation to their primary production than lakes and other marine systems.

### Article Links

[Download Full-text PDF](#)

[Return to Table of Contents](#)

### Please Note

Articles in L&O appear in PDF format. Open access articles may be freely downloaded by anyone. Other articles are available for download to subscribers only, or may be purchased for \$10 per article. All L&O articles are moved into Open Access after three years.