

NUTRIENTS, TROPHIC INTERACTIONS, AND BENTHIC SUSPENSION FEEDERS

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Barnegat Bay-Little Egg Harbor, NJ and Great South Bay, NY are shallow, unstratified, poorly flushed, and moderately eutrophic systems. The physical characteristics of these coastal lagoons probably once allowed extensive populations of benthic filter feeders to exert a controlling influence on the plankton. For example, in the mid-1970s a dense population of hard clams filtered about 40% of the volume of Great South Bay daily. Declines in hard clams and other benthic filter feeders in these systems have resulted in loss of this control; under current conditions, hard clams filter only about 1% of Great South Bay daily. A number of beneficial functions that can counter eutrophication are associated with extensive benthic filter feeding activities. These include regulation of water clarity that can promote benthic plant growth, enhanced denitrification associated with rapid sedimentation of organic matter, and the prevention unwanted or harmful algal blooms. Substantial grazing by benthic filter feeders may also be necessary for the maintenance of a plankton assemblage that promotes high commercial bivalve production. That is, relatively nonselective benthic grazers (compared to zooplankton) may have a positive feedback effect by shifting the plankton assemblage away from less nutritious, noxious, or toxic algae. If true, recovery of shellfish stocks may be inhibited until standing stocks reach high enough levels to restore this positive feedback loop.

Some bullets for managers:

- Large populations of benthic filter feeders probably exerted a controlling influence on the plankton in the past, but their decline has resulted in loss of this control.
- Restoration of hard clam, scallop, and other benthic suspension feeding populations can counter eutrophication in Barnegat Bay/Little Egg Harbor
- Hard clams can prevent unwanted or harmful algal blooms (e.g., brown tide)
- Recovery of shellfish in these systems may require rebuilding benthic filter feeding stocks until feedback mechanisms are restored.
