**Oysters, Jellyfish, and the Chesapeake Food Web**

Declining oyster abundances in Chesapeake Bay have led to declining abundances of stinging jellyfish known as sea nettles over the past several decades, according to research by Smithsonian Environmental Research Center (SERC) scientist Denise Breitburg and former SERC post-doctoral fellow Richard Fulford. Because sea nettles are major predators of other gelatinous animals known as ctenophores, the decline in sea nettles has led to a population boom of ctenophores. Because ctenophores are voracious predators of zooplankton—including oyster and fish larvae—the chain of effects from the decline of oysters in the Bay may have dramatic effects on the structure of the food web and hamper efforts to restore oyster populations.

Overfishing is a major problem in many aquatic ecosystems and it is becoming increasingly clear to scientists that its effects can be complex. Oysters are not only key members of the food web in many estuaries, but by building reefs they provide habitat for many other species. Sea nettles spend their adult lives swimming through the water in search of ctenophores and other prey, but they spend an earlier stage of their life cycle on the bottom attached to hard surfaces such as oyster shells. With fewer available oyster reefs in recent years, fewer sea nettles survive to adulthood and the population has declined.

Because the sea nettles help control predators of oyster larvae such as ctenophores, the loss of sea nettles may lead to a further decline in oysters, or at least make it difficult for oyster populations to rebound. This in itself has important implications for the ecology and economics of the Chesapeake, but there are also implications for the Bay’s fish populations. Not only do the fast-reproducing ctenophores prey on fish larvae, but they also compete for food with many adult fish such as the Bay anchovy. Despite the decline of sea nettles, the overall effect of the loss of oyster reefs might be to tip the ecological balance in the Chesapeake food web away from fish and toward gelatinous predators.

The study’s conclusions are based on trawls and visual counts of sea nettles and ctenophores in the Chesapeake Bay and its tributaries over several decades, beginning in the 1960s. By comparing the results to stream discharge and climatic data over the same time period, the researchers ruled out salinity and climatic changes as causes of the decline in sea nettles and the rise in ctenophores, which previous work had suggested.

---

**Current Literature**


Lafuma, L., and Maurice, S. 2007. Increase in mate availability


Vaughan, C., Nemeth, N., and Marineros, L. 2006. Scarlet ma-


