RECENT ECOSYSTEM SHIFT IN CENTRAL CALIFORNIA ALTERS HARMFUL ALGAL BLOOM PATTERNS

Rozalind Jester[1], Veronica Vigilant[1], Gregg Langlois[2] and Mary Silver[1]
[1]Ocean Science Department, University of California at Santa Cruz, Santa Cruz, California 95064, USA
[2]California Department of Health Services, Environmental Management Branch, 850 Marina Bay Parkway, Building G, Room 165, Richmond, California 94804, USA

In California, the toxic species of primary concern are the dinoflagellate *Alexandrium catenella* and members of the pennate diatom genus *Pseudo-nitzschia*, both producers of potent neurotoxins that have sickened and killed marine life and humans. During the summer of 2004 in Monterey Bay, we observed a dramatic change in the taxonomic structure of the phytoplankton community – the typically diatomdominated community shifted to more of a red-tide, dinoflagellate-dominated community. Here we use a six-year time series (2000-2006) to show how the dominant harmful algal bloom (HAB) species in the Bay up to that point, *Pseudo-nitzschia*, was replaced as a major toxin producer by two genera of toxic dinoflagellates, *Alexandrium* and *Dinophysis*. This change represents a shift from a genus of toxin producers that typically dominate the community during a toxic bloom, to HAB taxa that need only be a minor component of the community to create a toxic event. This has significant implications for monitoring because toxic events are therefore not dictated by the relative dominance of a species. To strengthen that point, this change in the local HAB species was also reflected in the toxins present in higher trophic levels. Despite the small contribution of *A. catenella* to the overall phytoplankton community, the increase in the presence of this species in Monterey Bay was associated with an increase in the detection of paralytic shellfish toxins in shellfish and clupeoid fish. We also provide evidence, based on the statewide biotoxin monitoring program, that this increase in the frequency and abundance of *A. catenella* events occurred not just in Monterey Bay, but also in other coastal regions of California. Our results demonstrate that changes in the taxonomic structure of the phytoplankton community influences the nature of the algal toxins that move through local food webs and also emphasizes the importance of monitoring for the full suite of toxic algae, rather than just one genus or species.