Temporal and spatial comparison of *Pseudo-nitzschia* species composition and domoic acid in Narragansett Bay, Rhode Island and the Northeast U.S. Shelf

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Diatoms are unicellular algae that make up a significant portion of phytoplankton biomass at the base of marine food webs. Narragansett Bay (NB), RI is home to several species in the diatom genus *Pseudo-nitzschia* (*P-n*), some of which cause harmful algal blooms by producing the potent neurotoxin domoic acid (DA). This toxin can lead to Amnesic Shellfish Poisoning in humans via consumption of affected shellfish. Although *P-n* has been well established in NB for over 50 years, DA levels have only recently become problematic, with shellfish harvest closures occurring in 2016 and 2017. While there have not been closures in subsequent years, DA continues to be detected in NB with DA maxima observed in the fall and summer. One of the hypothesized contributors to this seasonal upregulation in toxin production is fluctuations in species composition due to water input from the Atlantic Ocean, specifically, the New England Shelf (NES), which potentially carries *P-n* into NB. These inputs may introduce species of concern such as P. australis, a toxin producer observed in NB during the 2017 shellfish closure.

The NES LTER cruises occur during the winter and summer each year, sampling a north-south transect from New England to just beyond the NES break. Sampling performed during the 2018-2021 cruises has shown the presence of known toxin producing *P-n* species and DA presence at several stations closest to NB. In order to gain a more comprehensive understanding of the ecological changes leading to *P-n* blooms and toxin production within NB, species composition at each station was genetically identified, toxin levels were measured, and environmental conditions including temperature and nutrients were analyzed. These LTER data were then compared with samples collected from NB during the same months to identify temporal and spatial patterns that may influence *P-n* species composition and DA production.