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## 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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# ISABELLA CHURCH

(Biological Sciences, French)

## Temporal and Spatial Comparison of *Pseudo-nitzschia* Species Composition and Domoic Acid in Narragansett Bay, Rhode Island and the Northeast U.S. Shelf

Sponsor: Bethany Jenkins (Cell & Molecular Biology, Graduate School of Oceanography)

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 of the diatom genus *Pseudo-nitzschia* (*P-n*), some of which are known to cause harmful algal blooms through the production of the potent neurotoxin domoic acid (DA). This toxin can lead to Amnesic Shellfish Poisoning in humans through the consumption of affected shellfish. Although the presence of *P-n* has been well established in NB for over 50 years, DA levels have only recently become a problem, with shellfish harvest closures in 2016 and 2017. Although there have not been closures in the years since, DA continues to be detected in NB with seasonal peaks observed in the fall and summer (Sterling 2021). 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.

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 some of the 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. This data was then compared with samples collected in NB during the same month as LTER cruises to identify temporal and spatial patterns that may influence *P-n* species composition and DA production.