Boat on a Bay, Bay in a Bottle: Dynamics of the Toxic Diatom *Pseudo-nitzschia*

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Diatoms are photosynthetic aquatic unicellular organisms that account for approximately 20% of the world's primary productivity. Diatoms in the *Pseudo-nitzschia* genus can produce a neurotoxin, domoic acid (DA), that causes amnesic shellfish poisoning in humans and economic harm from fisheries closures. An understanding of what causes these diatoms to produce the neurotoxin can aid in preventing shellfisheries' lost income in addition to protecting human health. Since 2016, *Pseudo-nitzschia* has become an increasing problem in Narragansett Bay, RI, and it is unclear as to what is driving its toxicity. In response, starting in September 2017, weekly samples have been collected at three sites: the Narragansett Bay Long-Term Plankton Time Series, West Passage mouth, and East Passage mouth. This year in 2019, there was a DA event in late May through early June, with similar timing to what was observed last summer. The highest cell-associated DA concentration detected during the 2019 event was 25.26 ng/L of seawater, which is under the threshold to closure fisheries. At the *Pseudo-nitzschia* bloom peak and decline that occurred one week apart, we collected water with the community of toxin-producing *Pseudo-nitzschia* to investigate how DA production was affected by grazing pressure from microzooplankton using 24-hour bottle incubations with a two-point dilution. Bulk phytoplankton growth rates were 0.01 per day during the bloom peak and 0.66 per day during the decline. Grazing rates on the entire phytoplankton community were 0.08 per day and 0.25 per day with the higher rate occurring during bloom decline. Specific growth of *Pseudo-nitzschia* will be determined from cell counts and DA production in each experimental treatment will be measured. The results from this experiment may add to the understanding of what conditions cause *Pseudo-nitzschia* to increase toxin production; this is important for Narragansett Bay because shellfish is harvested during times of the year when blooms occur which could negatively impact humans from shellfish consumption.

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