

HIDDEN THIN LAYERS OF TOXIC DIATOMS IN A COASTAL BAY

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ABSTRACT

Harmful algal blooms (HABs) can threaten animal and human health through the production of toxins such as domoic acid. These blooms have become more frequent and toxic over the last few decades. In this study, we investigate the role that nutrients play in a toxic, subsurface bloom of *Pseudo-nitzschia* in northeastern Monterey Bay, California. Profilers and towed instruments were deployed and laboratory analyses of discrete water samples were conducted to describe the physical and biogeochemical conditions of the sampling site and to characterize the bloom. The *Pseudo-nitzschia* bloom occurred within a well-defined subsurface layer, containing high levels of domoic acid. *In situ* images taken within the layer revealed diatom flocs - indicators of nutrient stress. Nutrient ratios and alkaline phosphatase activity, commonly used to determine the nutritional status of phytoplankton, suggest that the *Pseudo-nitzschia* cells were phosphate stressed, and we speculate that this physiological stress led to increased toxicity of the bloom. Understanding how frequently blooms such as these are characterized by nutrient stress could improve our ability to predict the occurrence of HABs. With increased anthropogenic input of nutrients, such blooms could occur more often and with greater degrees of toxicity in the future.