

Analysis on How Certain Marine Phytoplankton Species are Being Affected by Ocean Acidification on the U.S East Coast

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Earth's oceans serve as a large atmospheric reservoir where carbon dioxide is absorbed and stored. In modern years, fossil fuel emissions have caused a large influx of CO₂ into the atmosphere and thus it is being absorbed into the oceans causing ocean acidification. This phenomenon has vast negative impacts, especially on the most abundant organism in the ocean— phytoplankton. Using data from a cruise in 2018, a prominent pH gradient has been mapped along the East Coast of the U.S, with Northeastern waters being more acidic. It is the purpose of this research to investigate how certain phytoplankton species are responding to this pH gradient and changes in their nutrient supplies. Four different species of phytoplankton were chosen from the Long Island Sound and are currently being tested in varying concentrations of CO₂ (280 ppm, 400 ppm, and 800 ppm) – to mimic the preindustrial, modern, and future pCO₂ levels of the Atlantic Ocean. With the preliminary results of this experiment, it's evident that the Diatom taxa is performing best overall, and specifically well in the 280 ppm, because of their unique carbon concentrating mechanisms that allow them to outcompete other phytoplankton in low pCO₂ waters. Future research will include monitoring this ongoing CO₂ experiment as well as testing other species of phytoplankton. It's imperative to understand how these phytoplankton will react to changes in their environments as harmful algal blooms are becoming more common with climate change.