

Nutrient shift occurring in the Gulf of Maine could affect planktonic ecosystem

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(PhysOrg.com) -- The Gulf of Maine waters are cooler, fresher and lower in nitrate than they were 30 years ago, causing a nutrient shift that has potential implications for the structure of the planktonic ecosystem, according to oceanographers at the University of Maine.

Based on recent oceanographic observations, coupled with a 50-year analysis of nutrients and hydrography, the UMaine research team hypothesizes that accelerated melting in the Arctic and freshening of the Labrador Sea have likely caused the Labrador Current to bring colder, fresher deep shelf waters into the gulf.

Until now, it was generally thought that the gulf's high [biological productivity](#) was fed by an influx of nutrient-rich deep slope water through the Northeast Channel between Georges Bank and Nova Scotia. The warm offshore slope water is higher in nitrate than silicate, helping determine the species composition of phytoplankton.

The UMaine data analysis, lead by [oceanographer](#) David Townsend, showed that from the 1960s to the 1970s, the deep waters of the eastern [Gulf of Maine](#) were saltier and warmer as a result of the slope water. But since the 1970s, the gulf's deep waters have become significantly fresher and cooler, and had lower nitrate and higher [silicate](#) concentrations.

The resulting altered nutrient regime may change the abundance of diatoms and dinoflagellates in the gulf, including the red tide dinoflagellate *Alexandrium fundyense* that grows best in high nitrate

conditions, according to the researchers, writing in the journal *Continental Shelf Research*.

Provided by University of Maine

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