

Gulf of Maine *Alexandrium catenella* Bloom Potential

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Summary:

Last week, low toxicity levels were reported in the coastal Maine (<20 ug/100g) except for Bear Island (93.6 ug/L). This week, toxicity by State of New Hampshire is Neogene test negative for Hampton Harbor. For the next several days, modeled *A. catenella* cell concentrations over top 10-m remains low nearshore, and slightly higher in offshore waters in the western Gulf of Maine (Fig.1). Winds were downwelling-favorable during the 28-30 May and quite until today. Winds will be downwelling-favorable for the upcoming 3.5 days (Fig.2); downwelling favors onshore cell accumulation. This week, observed cells are very low for Hampton and UNH pier (both at 22.5 cells/L), average of 67.6 cell/L for Little Bay Marine (Dover Point), and not sampled at ACB30, Gosport Harbor, and ACBSW2 (Hampton Beach Oyster Farm). Model slightly overestimated bloom on 16 May in MA waters, and underestimated bloom in NH waters for onshore waters (Fig.3). Model produces little cells in coastal eastern Maine (below detection limit), slightly higher cell concentrations in the western Maine coast.

Model Predicted Surface and Observed Shellfish Toxicity

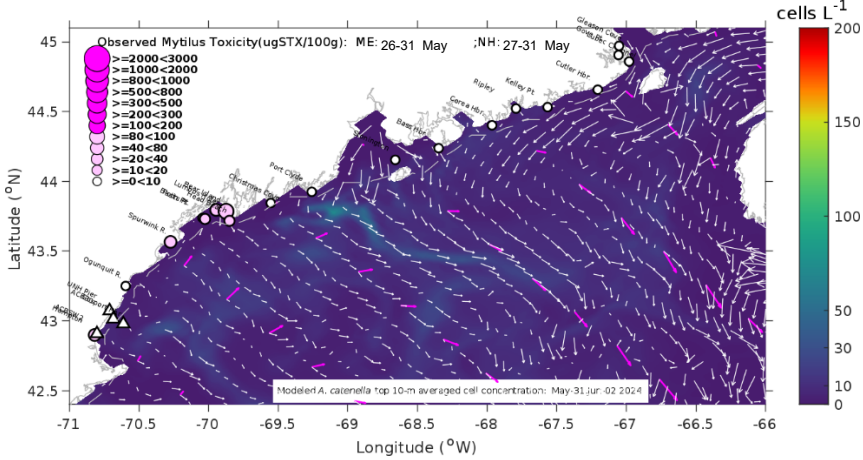


Fig. 1: Model predicted surface (top 10-m average) *A. catenella* cell concentration, surface current (white vectors) and wind stress (red arrows) averaged over upcoming 3.5 days by the nowcast/forecast, and observed shellfish toxicity (dots). Gray line stands for the 25-m isobath. Triangles represent sites where routine samplings for toxicity are collected, but no data is available for the week.

Transient Wind Leading to Onshore Transport

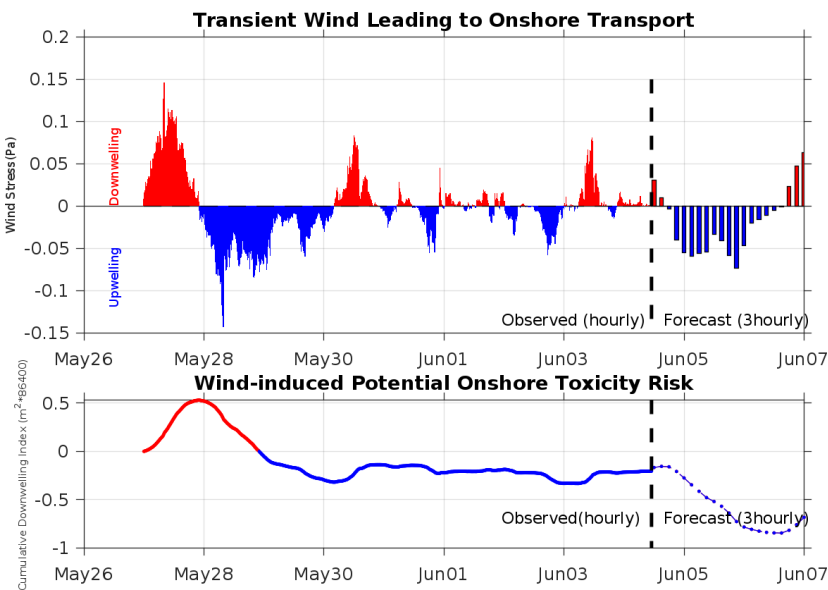


Fig. 2. (Upper) Transient alongshore wind for buoy I in the eastern Gulf of Maine during the past week. Forecast wind is from the NOAA NOMADS. Downwelling (red) means higher potential of cells transporting onshore, while upwelling (blue) means less potential of onshore transport. (Lower) cumulative wind-induced downwelling to predict potential onshore toxicity risk. Positive means more onshore transport, thus higher toxicity risk should offshore cells be readily available.



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Model Validation of *A. catenella* Cell Concentrations

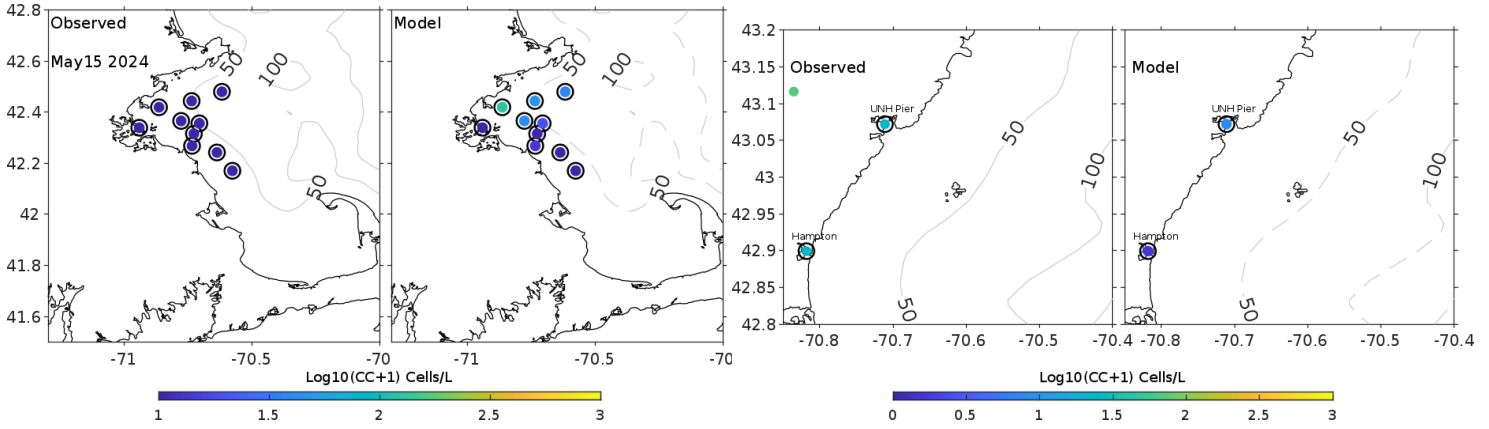


Fig.3. Model-data Comparisons of *A. catenella* surface cell concentrations for and (left) MWRA WN244 survey samples on 15 May, 2024, and (right) NH samples during 27-31 May, 2024,. Credit: Chris Nash, NH DES, and Scott Libby (MWRA/Battelle).

Time-averaged Surface *A. catenella* Concentration

Time-averaged surface *A. catenella* concentration: May 23:May 30,2024

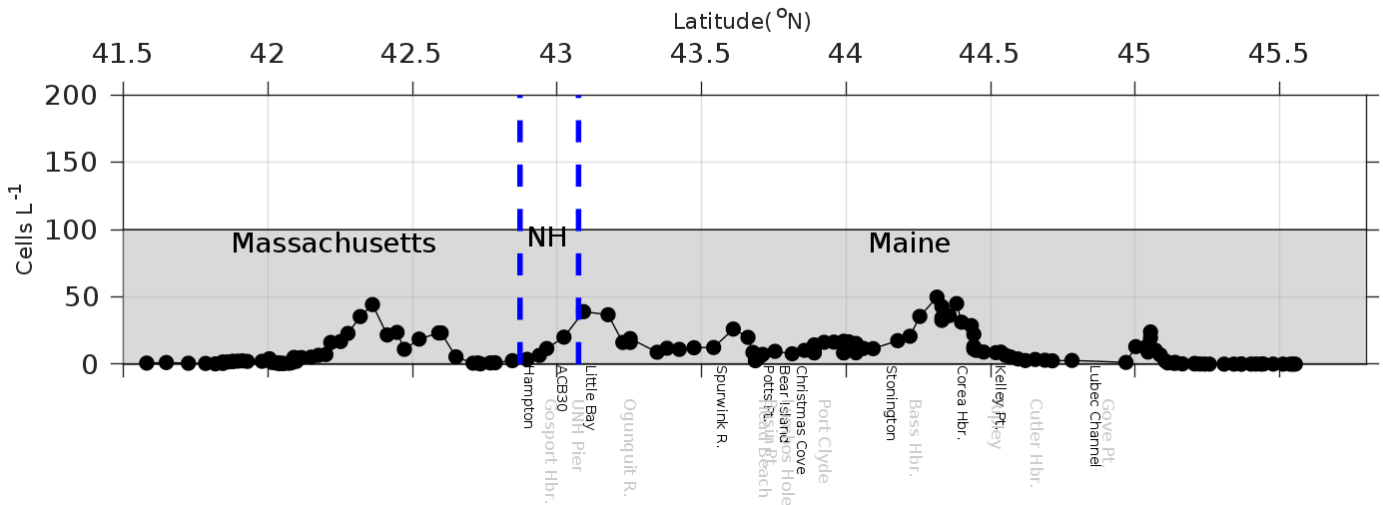


Fig.4. Weekly-averaged modeled surface *A. catenella* cell concentrations along 25-m isobath (see Fig.1 for isobaths locations). Also labeled are the closest onshore locations where toxicity was routinely sampled. It shows the weekly-averaged cell concentration when shellfish was exposed to the potential toxicity associated *A. catenella* blooms. 100 cells/L is the nominal threshold above which *A. catenella* tends to be toxic.

Additional Resources

- [Gulf of Maine HAB Forecast](#)

For questions, contact:

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