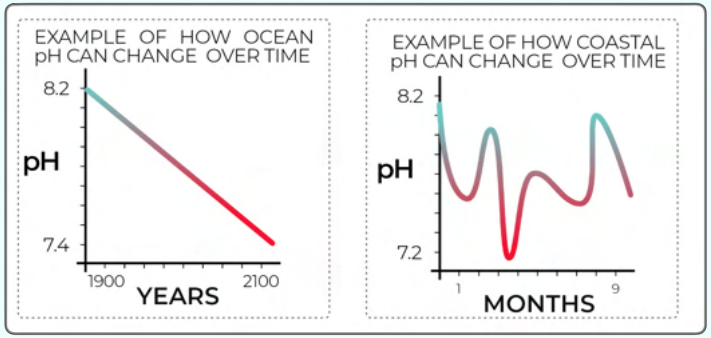
COASTAL ACIDIFICATION FOR INDUSTRY MEMBERS

Unlike ocean acidificiation, which is changing offshore water chemistry steadily over the course of years, the acidity of coastal waters fluctuates seasonally or even daily by as much as 1 unit of pH due to the many factors that converge at the coast.

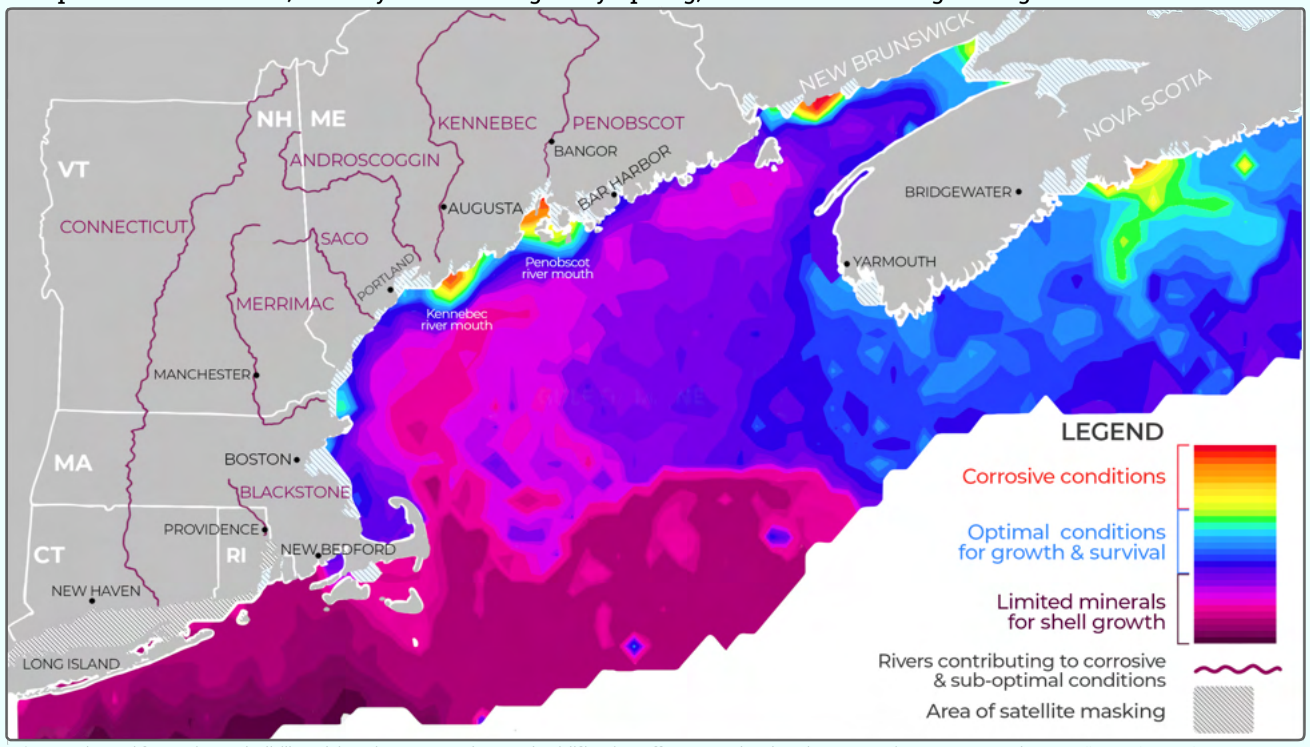


Unfortunately, we don't yet know the exact pH threshold at which shellfish will not grow or survive.

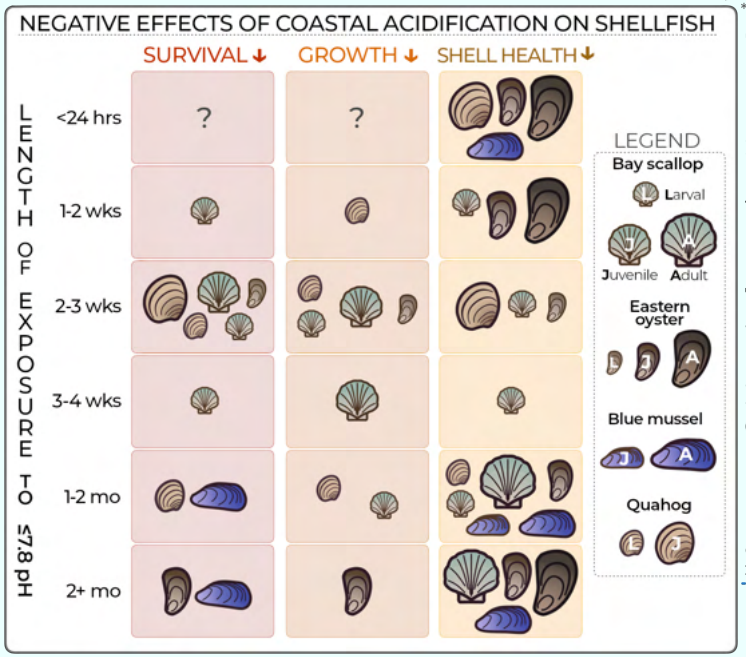
Understanding thresholds is even more difficult because coastal acidification is highly influenced by:

- daily & annual cycles of plant/algae production
- land-based fresh water & nutrient inputs
- mixing of ocean and coastal waters

This map shows general ocean and coastal acidification conditions in the Northeast based on the average minimum monthly amount of shell-building minerals (aragonite) available at the sea surface. The poorest conditions, usually seen during early spring, can be harmful to growing shellfish.

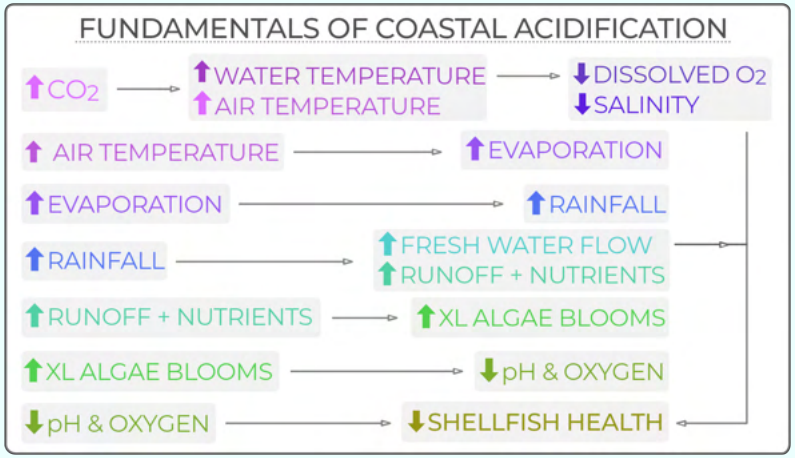


*Map adapted from Fig. 2, Gledhill et al. (2015). Ocean and coastal acidification off New England and Nova Scotia. *Oceanography.* https://doi.org/10.5670/oceanog.2015.41



There have been some studies on the short and longer-term effects of increased acidity and low aragonite mineral levels on larval and juvenile shellfish (info on adults is scarce), but nearly all were conducted in controlled lab settings.

Those studies seem to suggest that when pH is **~7.8 or below**, most species of shellfish found in New England start to show signs of stress. Generally, larvae are the most sensitive and more likely to be stressed or die than juveniles or adults. *Table compiled from Gledhill et al. (ibid) & Gazeau et al. (2013). Impacts of ocean acidification on marine shelled molluscs. *Marine Biology.* DOI 10.1007/s00227-013-2219-3



Scientists, resource managers, fishers, and aquaculturists need to work together to support projects that will monitor acidification conditions and effects on shellfish in real-world settings. Learning more about biological responses allows us to better predict how coastal communities and economies will be impacted, so we can prepare for the future.

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