Ocean Temperature and Acidification

Bottom Line

Our region has deep social and economic ties to the sea and tidal waters. Continued high carbon emissions through this century will alter our familiar ocean in ways that are presently unimaginable. For example, high scenario emission levels (RCP8.5) is predicted to cause a 100-150% increase in ocean acidity, a rate of acidification unparalleled in at least the past 66 million years.

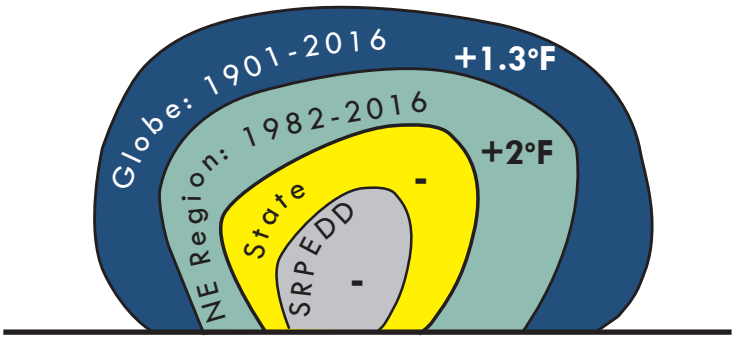
This Change Will Impact

- Precipitation & wind patterns
- Sea level (hotter salt water expands)
- Wildlife ranges
- Coldwater fisheries
- Oxygen concentrations
- Coastal economies
- Tourism / recreation
- The ability of shellfish to form shells

Visualization Tools

NOAA Fisheries Service Species Extents
Climate Change Indicators: SST
NorEaST: Stream Temp Data Inventory
Climate Change in the NE Shelf

Changes That Have Already Occurred - Sea Surface Temperature



The world's oceans currently absorb more than 25% of the carbon dioxide emitted to the atmosphere annually, and have absorbed 93% of the excess heat from human causes since the 1950s, making them warmer and more acidic.

	M	H
Global Average Sea Surface Temperature (SST) by 2100	+2.3°F	+4.9°F
Northeastern Average SST by 2080 (relative to 1976-2005)	+3.6°F	+5.8°F

MITIGATION LOOKS LIKE...

- Decarbonization of our energy and fuel systems
- Control what is in our collective power by protect our watersheds from acidification via nutrient loading from lawn and agricultural fertilizers

ADAPTATION LOOKS LIKE...

- Fishermen target new prevalent species
- Consumers shift their preferences and familiarity
- Governance agencies track regulations (quotas/permits) to keep pace with changes, both in terms of new fishable species and managing existing populations under heat stress

Future warming and its effects depend upon how much greenhouse gas we continue to emit into the atmosphere. We speak of 3 possible emissions scenarios relative to the 1986-2015 average: very low (RCP2.6 - assumes that carbon emissions have already peaked); low (RCP4.5 - assumes emissions peak around 2050 and then decrease); and higher (RCP8.5 - assumes carbon emissions continue to increase through 2100). These are the L-M-H scenarios identified above.