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Ocean Surface Temperatures Varied Along Northeast Shelf in 2013, Remain High

Sea surface temperatures for the Northeast Shelf Large Marine Ecosystem (LME) during 2013 were lower than the record high levels that occurred in 2012, but remained warm, especially in the Gulf of Maine and Georges Bank, according to NOAA's Northeast Fisheries Science Center (NEFSC). Sea surface temperatures (SST) for the Northeast Shelf in 2013 were just above 13 degrees Celsius (56F), making 2013 the second warmest year in the time series, which dates back to 1854. The results are reported in the Center's latest Ecosystem Advisory.

"Surface and bottom temperatures have moderated since 2012, when temperatures reached record highs, but the moderation has varied by location, with more cooling in the southern part of the ecosystem," said Kevin Friedland, an oceanographer in the NEFSC's Ecosystem Assessment Program. "Bottom temperatures remain above average in the Gulf of Maine but below average in the Middle Atlantic Bight. Despite the moderation, warm water thermal habitats remained at high levels in 2013."

The Northeast Shelf ecosystem as a whole does not typically have a fall plankton bloom, but blooms of various sizes and frequency do occur in areas throughout the ecosystem. Blooms can be detected in the Gulf of Maine in 7 out of 10 years, about even odds on Georges Bank, and are generally rare in the Middle Atlantic Bight. The 2013 fall bloom in the Gulf of Maine came early and was the second largest in the time series, while no fall bloom was detected on Georges Bank, and a localized summer bloom occurred in July off the New Jersey coast. Bloom magnitudes are highest close to the coastline, where concentrations of chlorophyll are highest.

The fall bloom starts earlier in the year in the northern part of the Gulf of Maine and begins progressively later in the southern part of the ecosystem.

The date of the fall thermal transition – the average temperature between summer and winter – has shifted by nearly one month in the northern part of the ecosystem, from around November 20 during the 1980s to December 20 now, but is only a week later in the southern end of the ecosystem. A shift has also taken place for the date of the spring thermal transition – which has occurred two weeks earlier since 2006 after remaining relatively constant for nearly 25 years.

"When the changes in spring and fall thermal transitions are considered simultaneously, the warm part of the year has increased by approximately one month for the Northeast Shelf ecosystem," Friedland said. "Organisms living in the ecosystem must deal with the challenges of a longer summer and competition from warm tolerant species entering their habitats."

The Northeast Shelf ecosystem continues to experience wide swings in physical conditions. The biological responses to these pronounced physical fluctuations have significantly influenced the dynamics of the Northeast Shelf LME, according to the advisory.

To view the 2013 summary of conditions for the Northeast Shelf Ecosystem and related background data, go to Ecosystem Advisory (http://nefsc.noaa.gov/ecosys/advisory/current/).

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Related Links:
Ecosystem Advisory Archives: http://www.nefsc.noaa.gov/ecosys/advisory/archives.html
Two Takes on Climate Change in the Ocean:
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