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ENVS 104

7 December 2017

Climate Change Driving Lobsters North

The warming ocean temperatures of the Gulf of Maine is driving the American Lobster out of New England. The rising ocean temperatures are pushing lobster populations north. According to the National Oceanic and Atmospheric Administration “Ocean temperatures around the globe have risen about 0.12°C per decade since 1980” (Greenhalgh 2016). Over the years a number of research initiatives have been done on the American lobster, and have produced some surprising results. A symposium was held to answer the many questions of researchers regarding the changing environment of the North Atlantic. Some major questions that had to be answered are how the researches can move forward with the limited funding they have and the big question, what can be done about the problem of the rising ocean temperature. These questions are continuing to be answered today. Studies have been conducted on why the ocean temperature is rising particularly fast near the Northeast Continental Shelf, and how this is affecting the lobsters.

Lobster plays a substantial part in Maine’s economy, it’s lobster industry is worth millions of dollars. While Maine’s lobster industry is currently thriving, places like Rhode Island are seeing a decline in the lobster population, especially in the amount of lobsters that make it to adulthood. Supervisory research oceanographer and director of the NOAA Northeast Fisheries Science Center laboratory in Naragansett says “It’s not that Southern New England lobsters are getting up and moving to the south of Maine”, but instead that “it’s the number of juvenile lobsters that make it to adulthood has dropped in southern New England and risen sharply in the Gulf of Maine” (Greenhalgh 2016). Although the demand for lobsters in Maine is booming, the problem of the rising ocean temperature still remains.

Climate change is something that has been in the news increasingly lately, and there has been some controversy regarding climate change and the Trump Administration. Trump and his administration have been known to be skeptical over climate change. In fact, “the Trump administration has indicated multiple times that climate change is not one of its priorities. Trump has previously labeled climate change as a hoax” (Wallace 2017). Also, recently, he has pulled out of the Paris climate accord. With all of these things happened, efforts to help mitigate climate change have not been active from the Trump Administration. Lessened efforts will not help reduce climate change, and will not help the rising temperature of the ocean.

It is no secret that global warming is drastically affecting the planet, and the ocean temperature, but the Northeast Continental Shelf marine ecosystem is warming even faster than surrounding areas. Around the southern portion of the shelf (Mid-Atlantic Bight and Georges Bank), a projected 4.1 °C (surface) to 5.0 °C (bottom) warming of ocean temperature from warming of ocean temperature from current conditions results in a northward shift of the thermal habitat for the majority of species (Kleisner et al.). Depending on the species, they will all react differently to the warming of the ocean. For example, “some southern species like butterfish and black sea bass are projected to have moderate losses in suitable thermal habitat, there are potentially significant increases for many species including summer flounder, striped bass, and Atlantic croaker” (Kleisner et al. 2016).

Something that is particularly interesting is the fact that the Gulf of Maine is showing a warming rate 99% faster than the rest of the ocean. The question arises as to why the Gulf of Maine is warming faster than other parts of the ocean. Studies have shown that ocean temperatures in the Northwest Atlantic has been linked to the relationship between the Atlantic Meridional Overturning Circulation, and also the position of the Gulf Stream.

Many factors play a role in the rising sea temperature. Some of the main causes of the rising temperature come from human activity. The result of all this human activity increases the greenhouse gas levels, which is absorbed by the ocean. The absorption of these greenhouse gasses causes the ocean temperatures to rise. This warming has “occurred from the surface to a depth of about 2,300 feet (700 meters), where most marine life thrives” (National Geographic 2010).

Although some species may be able to withstand a certain rise in the temperature, others will not such as the American Lobster. Lobsters are able to maintain their health in waters up to sixty-eight degrees Fahrenheit, any temperature warmer will that will cause the lobster to hit a “stress level”. Problems will start to arise within the lobsters’ respiratory systems, immune systems, and an increased chance of shell disease which could make it difficult for the lobster to reproduce (Greenhalgh 2016). An example of the temperatures rising to an unsuitable level is in the fall of 1999. During this year lobstermen in the Long Island Sound saw an above average water temperature and a decline in the lobster population (Greenhalgh 2016). The cause of this severe die off was due to a new lobster parasite discovered by scientists. This parasite is called paramoebae and was found in the nervous tissue of lobsters. The reason these parasites were able to infect the lobster was a result of their weakened immune system from the warm water temperatures that year.

Rising ocean temperatures are not only causing lobsters to move north, but are causing a shell disease as well. This disease stretches from Cape Cod to Nova Scotia. Although it is more prevalent in the warmer waters of Southern New England, shell disease still exists in the Gulf of Maine. This disease has been affecting lobsters increasingly more and more over the years. Dr. Richard Wahle, of the University of Maine’s Darling Marine Center stated that “up until 2013 the disease was found in just a few lobsters per thousand, but over the course of a year, its prevalence rose to a few per hundred, though these numbers were restricted to the southern end of the Maine coast (Violo 2016). This shell disease is known as epizootic shell disease (ESD), which is a “bacteria-induced degeneration of the cuticle of the American lobster (Homarus americanus) that can lead to disfigurement, decreased health, and subsequent mortality (Tlusty 2014). The increasing amount of lobsters who are getting this shell disease shows how the rising temperature of the ocean can cause chain effects.

The National Oceanic and Atmospheric Administration (NOAA) has put in money in order to research and better examine shell disease in Southern New England. NOAA is not the only group to help research more on the American lobster and climate change, the National Science Foundation’s Coupled Human-Natural Systems Program has helped to provide funding for research on the socio-economics of lobsters in the Gulf of Maine (Wahle 2017). Groups such as NOAA and the National Science Foundation’s Coupled Human-Natural Systems Program providing funding is important in able to help better understand how climate change is affecting marine species such as the American lobster.

A study was done that had shown there were clear differences in distance of the centers of distribution of the top species in New Hampshire, Massachusetts, and Maine. According to the study “in all three of these states, American lobster suitable thermal abundance is also projected to increase by more than 25% (Kleisner et al. 2016). This statistic may indicate that the warming temperatures in the Gulf of Maine could potentially create ideal conditions for the American lobster. For other species such as monkfish, white hake, silver hake, and sea scallops could experience “strong declines in suitable thermal habitat related to warming waters” (Klesiner et al. 2016). It is interesting to see how other species are reacting to this change in contrast to the American lobster.

Although we cannot completely stop the rising sea temperature and the effects of global warming, there are ways we can help reduce. Some of the ways we can help reduce these effects include cleaner technologies, making energy and transportation systems more efficient, and reducing carbon consumption. By addressing these things, we may help reduce the rate at which the temperature is rising. All human actions have some kind of result to them, and how people live their daily lives affects not only terrestrial life, but marine life as well. Spreading awareness about climate change and taking action could help save thousands of lobsters, and many other marine species as well.

Despite the fact that an increasing number of lobsters have been reported to have shell disease and are moving north, there are some successes. For example, all of the organizations who are providing funding for research towards the issue are helping greatly. Also, many people are taking action in order to reduce the size of their carbon footprint. Although the Trump administration has withdrawn from the Paris Agreement, there are still people who are stepping up to help limit future warming. These people include state leaders, mayors, governors, and other officials.

Lobster plays such a substantial role in Maine’s economy and in in marine ecosystems, it is important that we continue to find ways to mitigate climate change in order to protect the American lobster and other marine species. Not only does lobster contribute to Maine’s economy, but it employs thousands of hard working people as well. If people change some parts of their daily lifestyle, and take action by making others more aware they will be taking a step in protecting the American lobster and other much loved marine species. This topic is important to be because as a current Marine Biology major, the sea level rising and warming is extremely concerning to me. And it is disheartening to see some species at risk because of human activity and other factors.

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