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## Op-Ed: Long Island Sound Degradation

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Op-ed article

Fishing is a 2 billion dollar industry in the region surrounding the Long Island Sound. It is a pivotal part of the economy, and it is major source of income for people living in this region. However, because of the effects of climate change, this ocean-centric way of life is threatened. The health of the global oceans are rapidly declining, and the Long Island Sound, located in the Northeast, is degrading at one of the fastest rates in the world.

The Long Island Sound is approximately 100 miles in length and spans from the East River to the tip of Long Island, it is bordered by Long Island to the south and Connecticut to the north. The Sound however, is not as healthy as it used to be. Levels of natural fish populations such as striped bass, bluefish, winter flounder, and cod and being replaced by warmer water fish species like porgies, black sea bass, and northern kingfish fish that are typically native to the mid atlantic region. Lobsters, clams, oysters, and scallops are also feeling the effects of the degradation in the Sound. Their levels have been on the decline since the 90s. These ecosystem disruptions can be attributed to rising water temperatures and ocean acidification. According to data collected by Project Oceanology, the water in the Sound is warming at a rate of about .45 degrees Celsius, which is about 4 times faster than the rate of global oceans. It is this warming that is pushing the cold water species out of the Sound and attracting the warm water species. Also, the acidification of the water causes the shells of lobsters and other crustaceans to weaken, threatening their survival. It isn't only the animals in the ecosystem that are being affected by these declines, the economies of Connecticut and New York are being impacted. As mentioned above, the area boasts a huge commercial industry. But this industry is threatened by the decreased amount of native fish. According to Atlantic States Marine Fisheries Commission, In 1984 the total catch of winter flounder was 35 million pounds, but in 2010 the catch was only 3.5 million pounds. The demand for winter flounder has not decreased, but the supply has greatly decreased, meaning fisherman are losing profit because there are not enough fish to supply the demand. The same thing is happening for shellfish. In the 80s and 90s lobster fishing was a huge

source of revenue for the region, but now it is nearly impossible for lobsterman to make a living on lobster alone. These people have had to change their lifestyle, and if the levels keep declining, the changes will need to be more drastic. Furthermore, the charter fishing industry is very prevalent in this economy. Tourists come to the Connecticut to catch the classic New England species of fish, however many charter boat captains have reported low levels of these native fish. If the species do not replenish, tourists will go somewhere else for their charter fishing adventures taking valuable revenue away from the economies of Connecticut and New York.

The root of the ocean acidification and warming problems in the Long Island Sound are high levels of carbon emissions. Acidification is caused by an increase of carbon dioxide in the atmosphere.  $\text{CO}_2$  is absorbed by the ocean where it reacts with the water molecules to form acid.

Ocean warming is caused by excess heat from carbon emissions being absorbed by the water causing the temperature to rise. In order to combat these high carbon emissions and end the trends of warming and acidification, there should be a tax levied on the amount of carbon households and firms use each year. The tax would affect the areas surrounding the Long Island Sound: Long Island, New York City, and Connecticut. It would be placed on all carbon products including gasoline, natural gas, coal, heating oil, and propane. Many carbon taxes are levied upstream, meaning the place where the carbon is extracted is where the tax would be paid, however for this to control the levels of carbon dioxide entering the sound, the tax would need to be levied at the place of consumption. This means that if a company in the region consumes carbon they will be taxed for the carbon that they use. This will inspire the households and businesses near the Long Island Sound to cut down on their carbon use. Consumers will be more likely to find alternatives to carbon so that they do not have to pay the tax. However, it may take years to see the changes in the health of the ocean from this carbon tax because of the inelasticity of carbon products. Inelasticity has to do with the fact that there are not many alternatives to carbon, so it will be harder to cut down on consumption quickly. However, eventually, paying the extra tax for carbon will not be worth saving money on implementing new products, so business and households will switch to carbon alternatives. With this decrease in carbon emissions in the area, the air near the Sound will be cleaner. Because the economy and the environment are so connected, better ocean health will in turn mean a better economy. If there is less carbon pollution, the rates of ocean warming and acidification will slow down, giving the species in the Sound time to recover. Which will help fix some of the economic problems of the region like the shortage of native fish and the decline of the charter fishing industry.

Overall, the best way to go about fixing the ocean warming and acidification problems in the Long Island Sound is to implement a tax on carbon products in the region. This will give firms and households incentives to lower their carbon consumption which in turn will reduce the amount of carbon dioxide being absorbed by the Sound. Thus bringing the levels of native species back up which will improve the state of the commercial and charter fishing economies.