

1. Mark your confusion.
2. Show evidence of a close reading.
3. Write a 1+ page reflection.

How We Ruined the Oceans

Source: *The Week* 2/14/15

Why are the oceans in trouble?

They can no longer absorb the damage inflicted by the 7 billion people on Earth. Over many decades, the human race has overfished key species to near extinction, and polluted them with carbon dioxide emissions, toxic chemicals, garbage, and discarded plastics. A groundbreaking new study, recently published in *Science*, warned that our oceans are being irreparably damaged by human activity and could be on "the precipice of a major extinction event." Coral reefs, home to a quarter of the ocean's fish, have declined by 40 percent worldwide. Stocks of swordfish, yellowfin tuna, and other large fish that people avidly eat are down by 90 percent. Marine scientists say that if mankind does not dramatically change how it treats the oceans and their inhabitants, many marine species will become extinct — with catastrophic consequences for the food chain. "If by the end of the century we're not off the business-as-usual curve," says Stanford University marine ecologist Stephen Palumbi, one of the report's authors, "there's not much hope for normal ecosystems in the ocean."

How does global warming affect fish?

As the oceans heat up, many species are migrating to cooler waters to survive. Some inevitably will fail in these new habitats. Warmer temperatures also make coral reefs more vulnerable to "bleaching," a chemical process that drains the organisms of their brilliant colors and leads to their death. Other problems are caused directly by the burning of fossil fuels. With oceans absorbing a quarter of the world's CO₂ emissions, they have become 30 percent more acidic, causing inhibited shell growth in coral and crustaceans and reproductive disorders in fish. Power plant emissions — especially from burning coal — put tons of highly toxic mercury in the air, which settles into the ocean. The mercury is taken up by sea creatures and concentrated in predatory species. A recent study found that mercury levels in Pacific yellowfin tuna have been rising at a rate of 3.8 percent a year since 1998. "If it keeps going like that," says co-author Carl Lamborg, eventually almost "every kind of fish is going to be potentially hazardous."

What about plastic?

Our oceans contain an estimated 5.25 trillion pieces of plastic — most of them less than 5 millimeters wide — weighing a total of 269,000 tons. A lot of this detritus, which mostly comes from plastic bottles and discarded commercial fishing gear, has collected in vast systems of rotating ocean currents, known as gyres. The largest such collection, the "Great Pacific Garbage Patch," covers an area twice the size of Texas. The mostly tiny pieces of plastic in this and other patches contain many potentially hazardous chemicals, and are being eaten by fish and birds that mistake them for plankton or small fish. As smaller animals are eaten in turn by predatory fish, the plastic becomes more concentrated and winds up in people who eat seafood.

Can't we remove all the plastic?

No chance. The National Oceanic and Atmospheric Administration estimates that to clean less than 1 percent of the North Pacific it would take 68 ships, working 10-hour days, a whole year. A skimming operation of that scope would also suck up tons of marine creatures. And with global plastic production doubling every 10 years, "there's no way to keep up," says Chris

Wilcox of Australia's national science agency. "It would be as if you were vacuuming your living room, and I'm standing at the doorway with a bag of dust and a fan."

How big a problem is overfishing?

Since fishing became industrialized just over a century ago, most commercial species have been reduced by more than 75 percent — and some by 99 percent. As stocks dwindle, fishing fleets are increasingly resorting to "bottom trawling," a hugely destructive technique that involves dragging a large net up to 60 meters wide along the seabed, scooping up everything in its path. Most countries now have fishing quotas, but they're hard to enforce: An estimated 1 in 5 fish sold in a shop or served in a restaurant has been caught illegally.

Why aren't we doing more?

Like global warming, the plight of our oceans is an issue that affects every country in the world. But with each government beholden to its own voters — and its own fishing, plastic, and energy lobbies — it's almost impossible to achieve any consensus. Ecologists insist it's not too late to solve the problems affecting our oceans. Some schemes, such as the introduction of "safe zones" where fish can naturally replenish, have worked on a small scale and could be expanded. The authors of the *Science* study say it's possible to reverse the current crisis, but political will is required. "The next several decades," they say, "will be those in which we choose the fate of the future of marine wildlife."

The dangers of a fishy diet

For decades, doctors and health officials have encouraged people to eat as much seafood as possible because of fish's high levels of omega-3 fatty acids, which are good for heart and brain health. But in recent years that recommendation has been tempered, as emissions from factories and power plants have pushed mercury concentrations in oceans and fish up to potentially dangerous levels. Mercury is highly toxic and can cause neurological damage and accumulate in organs; in children and fetuses, it can lead to long-term cognitive disorders. Last year, the FDA updated its advice on fish to say that pregnant women and children should avoid eating tilefish, shark, swordfish, and king mackerel, and limit their consumption of white tuna — all of which contain particularly high levels of mercury because they're at the top of the food chain.

Consumer Reports recently criticized the FDA guidelines on fish consumption as inadequate, saying that *anyone* who eats 24 ounces or more of fish per week — or about six servings — "should steer clear of high-mercury choices," and warning people not to eat canned tuna or sushi made from tuna.

Possible Response Questions:

- What does the future hold for our oceans? Explain your prediction.
- Select any passage and respond to it.