New U.N. report says oceans are in trouble

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Image 1. The town of Pacifica, California, just south of San Francisco, is ground zero for the issue of coastal erosion. On January 20, 2019, the combination of ocean surge and a king tide caused high waves. Some homes and apartment buildings were destroyed. Photo by: Carolyn Cole/Los Angeles Times/TNS

The planet is in hot water — literally. Warmer temperatures are melting ice and heating up oceans. The problem will have troubling consequences for humanity, warns a new United Nations (U.N.) report.

Warmer And More Acidic Oceans

Over the next century, climate change will make the oceans warmer and more acidic, which makes it harder for marine life to thrive. Melting ice sheets will drive up sea levels at a quick pace. Marine heat waves will become 20 to 50 times more frequent, harming delicate ecosystems. The total number of animals in the sea could drop as much as 15 percent, according to the U.N. Intergovernmental Panel on Climate Change (IPCC) report.

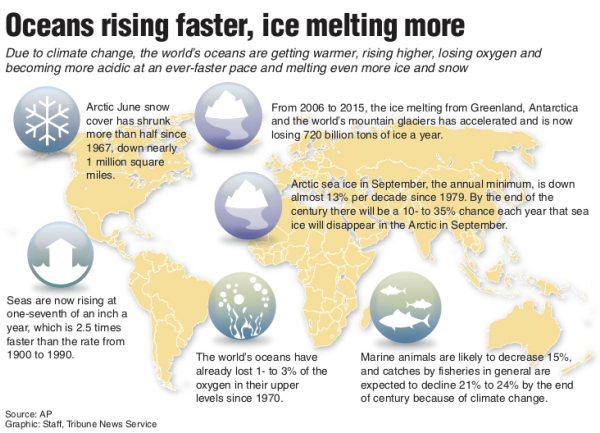
"The oceans and ice are in trouble, so we're all in trouble," said Michael Oppenheimer. He's a climate scientist at Princeton University in New Jersey and a lead author of the report.

The report makes clear the importance of society's efforts to reduce greenhouse gas emissions in future decades. This will determine how much trouble.

It's "the difference between an unmanageable problem and one that humans can deal with," Oppenheimer said.

Carbon dioxide is an example of a greenhouse gas. It's created by burning fossil fuels, such as coal and oil, for energy. When too much carbon is released, the Earth's atmosphere traps more and more heat.

The study on oceans and ice, released September 25, comes close on the heels of the U.N. Climate Action Summit in New York City, which failed to bring about strong commitments from the world's biggest polluters. Yet the report highlights just how costly delaying action will be.



A Heavy Toll On Marine Ecosystems

Thus far, the oceans have been the quiet hero of our warming world. They have absorbed about a quarter of the carbon dioxide humans have pumped into the atmosphere since the industrial revolution, and 90 percent of the resulting heat.

"But it can't keep up," said Ko Barrett, a researcher at the National Oceanic and Atmospheric Administration. Barrett is also an IPCC leader.

The report illustrates how climate change has already started to alter the chemistry and circulation of the oceans. It also shows its heavy toll on marine ecosystems. Coastal communities will be home to a billion people by 2050. These areas are already feeling the effects, too, starting with rising seas.

Over the last century, sea level rise was primarily driven by water running off melting mountain glaciers. It came from places like Alaska and the Andes Mountains in South America. Now, however, the massive ice sheets in Greenland and Antarctica have taken over as the largest contributors, and they are increasing sea levels faster than ever.

Since 2006, sea levels have risen at a rate of 0.14 of an inch per year. That's more than double the rate over the previous century.

The big question is what will happen next.

New research has been done since the last IPCC assessment in 2014. The findings caused the authors of this year's study to increase their estimates of future sea levels.

Compared to the turn of the 21st century, sea levels will increase about 1 1/2 feet by 2100 — if society rapidly reduces greenhouse gases. The levels would rise 3 feet by 2300.

That will present many challenges, "but things will evolve slowly, giving humans plenty of time to plan," Oppenheimer said.

On the other hand, countries could fail to curb emissions in the next few decades. The world will then see about 3 feet of sea level rise by the century's end — and much more after that.

In the worst-case scenario parts of the Antarctic ice sheet start to collapse, and the sea level could rise as much as 17 feet by 2300. That would probably outpace society's ability to adjust, Oppenheimer said.

Approaching Instability

"Indications are there that instability might be on its way," said Regine Hock. She studies glaciers at the University of Alaska and is an author of the report.

Regardless of how much sea levels rise over the long term, they'll cause problems for coastal communities in the short term. The coasts will experience increasingly devastating storm surges and high tides.

By 2050, flooding that once occurred only once a century will happen at least once every year in many places. That will happen even under a best-case scenario, according to the report. In addition, hurricanes will intensify no matter how quickly countries reduce greenhouse gas emissions.

The assessment also looked at how climate change is affecting fish populations and the communities that depend on them.

Warming waters have put many marine animals on the move. Creatures that can't relocate, like corals, could simply be lost.

The report authors called on governments to protect ecosystems and people. It emphasized the need to slash greenhouse gas emissions and reduce other stresses on marine animals to help them adjust to climate change.

Governments could also help people adjust by improving early warning systems for disasters. Additionally, they could encourage people to plan for climate change by rebuilding away from the coasts altogether.

Oppenheimer believes the U.S. is particularly far behind. The National Flood Insurance Program gives people a reward to remain, where they will be exposed to future storms. The government's reactive approach means there is often no money for adaptation until after a disaster has struck.

"These communities along the coast are basically sitting ducks," he said.

Still, there are also reasons to be hopeful. The ocean holds the potential to lower greenhouse gases significantly, according to the High Level Panel for a Sustainable Ocean Economy, a group of research scientists and world leaders.

Oceans can also help by providing climate-friendly foods. As the IPCC's last major report on land use pointed out, eating beef and other land-based meats is a significant driver of climate change. However, fish is a green alternative.

"You can get more out of the ocean if you just pay attention and manage it properly," Matthews said.

If people fail to pay attention, though, "the consequences for humanity are sweeping and severe," Barrett said.

"What's at stake is the health of ecosystems, wildlife and — importantly — the world we leave our children."