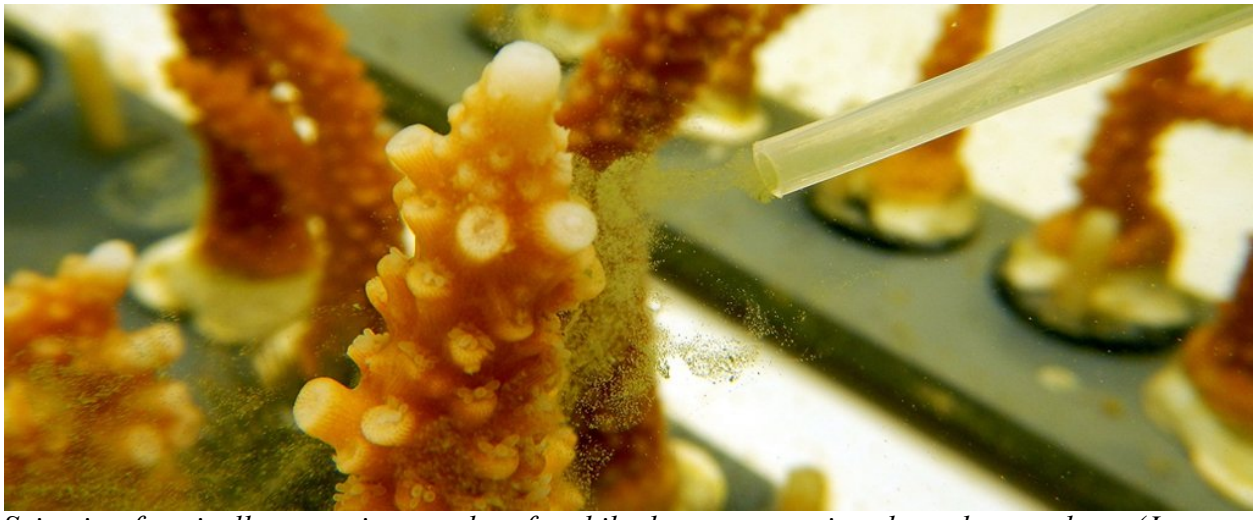


Scientists frantically try saving coral reefs, while these corporations keep destroy them. (Joe Raedle/Getty Images)

These 20 Companies Caused More Than One-Fifth of Ocean Acidification Since 1965

TESSA KOUMOUNDOUROS 13 DEC 2019

Our oceans are acidifying at a rate not seen in 66 million years. They're now 26 percent more acidic since 1880, which is profoundly changing ecosystems and impacting the fisheries that rely on them, all around the world.

This is not only threatening countless jobs, including 4.3 million livelihoods relying on reefs in The Coral Triangle, and 43,000 jobs along the west coast of the US, but our food security, too.

A new study shows exactly who is to blame. Just twenty companies caused over one fifth of the ocean acidification that occurred since 1965. This is the time period after these companies understood the dire impacts of their industry; they include Exxon, Chevron, BP, Shell and Saudi Aramco.

In fact, climate scientist Rachel Licker from the Union of Concerned Scientists (UCS) and colleagues have shown that the largest 88 gas, oil and coal producers and cement manufacturers are responsible for more than half of the ocean acidification since 1880.

"We've known for several decades that burning fossil fuels is by far the largest driver of ocean acidification, but we weren't able to track how much any one fossil fuel company contributed to the problem, and in what way," said Licker.

"Scientists can now quantify how much more acidic the ocean has become as a result of each fossil fuel company's products."

Ocean acidification occurs when excess CO2 dissolves into seawater, producing a series of chemical reactions that lead to more hydrogen ions, increasing the water's acidity. This altered ocean chemistry has already led to a 10 percent decrease in carbonate concentrations since industrialisation.

Less carbonate means it's harder for calcium carbonate to form; this is a vital molecule for most marine animals because it is part of their shells and exoskeletons. And if the concentration of carbonate drops too low, calcium carbonate dissolves.

"The organisms at risk from acidification form the foundation of the marine ecosystem food chain - including some types of plankton, algae, shellfish, and coral that may struggle to grow and survive in a future warmer, more acidic ocean," warns biogeochemist Scott Doney from the University of Virginia.

Increased acidification has been shown to reduce the survival of baby krill and other shellfish, and change fish behaviour in ways that make them more vulnerable to predation.

Ocean acidification is happening independently of, but in combination with, climate change - with the effects of each often compounding the other. As climate-change-exacerbated heatwaves cause coral bleaching, the ability of corals to recover is hampered by increased acidity, slowing their calcium carbonate reliant growth and reducing their reproduction.

Building on methods that linked temperature and sea level rise with responsible companies in 2017, Licker and colleagues calculated the amount of ocean acidification caused by fossil fuels during extraction, refinement and use across two time periods. Because CO2 builds up in the atmosphere over time, they examined the effects of cumulative emissions since industries began emitting in 1880, all the way to 2015.

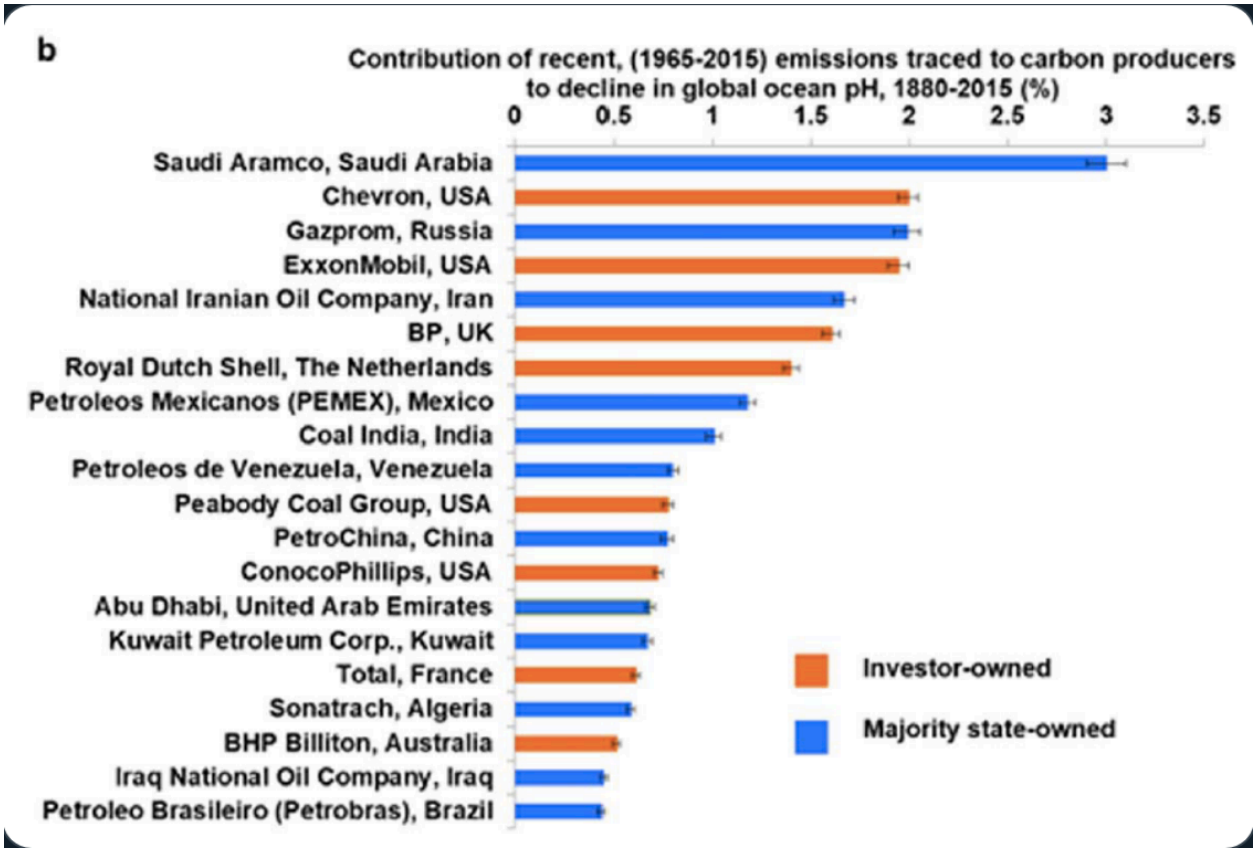
"We also examined acidification due to emissions from 1965 to 2015, roughly consistent with the period when major fossil fuel companies were increasingly aware that continued emissions from the use of their products posed significant climate risks," Doney told ScienceAlert.

The researchers also identified some regions that are disproportionately more affected by increasing acidity, including the Coral Triangle, Peru Current, and California Current. These areas have already experienced large declines in surface water pH and are particularly vulnerable in terms of ecology and human dependence.

Scott Doney @ScottDoney1

Replying to @ScottDoney1 and 10 others

Switching emissions analysis from nations to companies can inform societal consideration of carbon producer responsibility for current & near-term risks of further loss & damage to human communities dependent on marine ecosystems & fisheries vulnerable to ocean #acidification



Only one day after this report was released, Saudi Aramco, who tops the ocean acidification contribution chart, became the most valuable listed company in history. Despite having vast amounts of resources, none of these major carbon polluters are showing any sign of changing their ways.

They still plan massive increases in fossil fuel production, while funnelling multi-millions of dollars into obscuring the science and prevent action against them, with the aid of political leaders who have failed to implement policies to reign them in, even as their citizens suffer the consequences.

"Companies could have acted responsibly to inform the public about risks and taken actions to reduce emissions. They chose instead to disinform and delay," said UCS science policy researcher Peter Frumhoff.

"By putting a number on fossil fuel company contributions to disruptive ocean acidification, our study can inform decisions about their responsibilities for damages that could have - and should have - been avoided."

This new study may help bolster litigation cases against the fossil fuel industry, such as those mounting in the US, including Pacific Coast Federation of Fishermen's Association who have filed a lawsuit against 30 fossil fuel companies.

"Our study provides a scientific basis for working on research, marine resource management, policy, and legal aspects of ocean acidification moving forward," said Doney.

He believes we must now not only look to limiting future human carbon emissions, but also find ways to adapt to the lower pH our waters are already experiencing.

As for what we all can do, divesting as much as we can from fossil fuel companies, voting for leaders who have no links to these companies and speaking out about what we're facing are all important tasks.

"The extent and severity of future harms of ocean acidification and climate change on marine species and ecosystems, and the human communities dependent upon them, will be largely determined by the future course of further carbon emissions," the researchers conclude.

You can read the full peer-reviewed report at *Environmental Research Letters*.