

30cm by 2050: is sea-level rise so bad?

By Daniel Mooney

In the past hundred years, sea levels have risen by 1.2 millimetres, a small amount, with big consequences. Rising sea levels are mostly caused by glaciers melting, global warming, and salt levels in the ocean. It can create catastrophic consequences such as the sinking of land masses, collaptures in the ocean's ecosystem, the melting of glacial regions, and even alter life on Earth itself.

According to *Global Climate Change: Evidence* (2018), glaciers counted as 2.7 percent of all water. For tens of thousands of years, the glaciers have been slowly melting naturally. But since the industrial revolution, humans started playing a part in the melting of glaciers. Between humans emitting more greenhouse gasses than ever, and global warming, the release of water from glaciers is higher than ever recorded in history. Glaciers are landmasses created from ice, and since they are frozen, ocean waters are warmer. So, in places where the ocean meets glacial regions, they will melt faster, run into the ocean, and cause sea levels to rise. Glaciers in Antarctica and Greenland are melting at alarming rates, and scientists think that they are being melted from the bottom up. Ocean water is seeping underground and speeding up the heating of glaciers from underneath them. There are bases in Antarctica and houses in Greenland that are going to have to be evacuated soon, and humanity could lose years of scientific research when those bases are lost, and other citizens of Greenland might lose their possessions and homes. It isn't just about saving the people though, it's about saving the land (*Global Climate Change: Evidence*, 2018).

But that isn't the only playing factor for the heating of glaciers. The salt in the water also causes ocean temperatures to rise and affect more glacial regions. Saltwater draws in heat from the atmosphere {which is heating up thanks to global warming} and releases it into the ocean. Salt in the water also affects the animals that live in the ocean. Algae won't be able to survive in high salt content water, and as Dr Ben Mooney (Personal communication, June 6, 2020), "Algae provides the majority of the oxygen in the world". Therefore, oxygen breathing life forms will no longer have enough air. As well as all these reasons, algae are also the main producer in the ecosystem undersea, and it is well known that when one component of a food chain is removed, especially a producer, the affects can be cataclysmic. There is already a problem in the ocean's ecosystem; there are decreasing numbers of krill in the ocean. Krill are the primary consumers of the ocean's ecosystem, which feeds off the algae. So, if there isn't any algae or phytoplankton to feed the krill, oceans are going to be in more danger of ecosystematic collapse than ever before (B. Mooney, personal communication, June 6, 2020).

When the ocean levels rise, the habitable area of an island decreases. The world's lowest lying islands are the Maldives, India, and are the most threatened by rising sea levels. On average, the Maldives are 1.3 metres above sea levels, and if sea levels keep rising, the islands are the first place to disappear underwater. There are communities of people living on sinking islands that have nowhere else to go, living in fear as the water slowly rises around them. History will be lost as cultures disappear underwater or dissipate into societies where nobody cares enough to preserve them. Lives may even be lost because of people who have to stay on the islands as they sink. We can learn from the knowledge and stories or culture of others, but if they no longer have their homes, or even lives, how can we learn things from their perspective? We respect each other's practises and religions, but it is disrespectful to let entire cultures or societies to disappear. According to Warne (2015), "Reef islands change shape and move around in response to shifting

sediments, and that many of them are growing in size, not shrinking, as sea level inches upward. The implication is that many islands—especially less developed ones with few permanent structures—may cope with rising seas well into the next century.” the focus is on the last sentence. “They may cope with rising sea levels into the next century”. The next century. This isn’t just a problem that will go away in a hundred years, this problem will be around for more than just one century. Sea levels are going to rise and fall until the earth ends. Most humans don’t actually give their attention past their own lifespans, so why would they care if some islands disappeared, they should care because there are *other people* who are going to be affected. This just proves that some people are too short-sighted to do anything about sinking islands or endangered cultures.

When the glaciers melt, they release their water which usually ends up in the ocean. That means the oceans mass is increasing, causing the sea levels to rise (Attenborough, 2018). But there are also other outcomes that can affect every living being on the planet. Since there is more water in the oceans, the mass of the oceans grows larger, so the sun’s gravitational pull affects the earth more, causing the earth’s axis to change. Earth’s current axis is tilted at 23.5 degrees, but what would happen if that changed? All of a sudden, equatorial regions will be receiving less or more sunlight than before, and the carefully balanced ecosystem will collapse. Species will die, and some will evolve. Life on earth as we know it will change. Seasons will change drastically and that will cause more deaths. Winter will be more severe in some areas, there may not even be a winter in others (Pugh, Hunter, Coleman & Watson, 2002) The changes in the climate will destroy food chains as some plants may not be able to grow in the strange new conditions. Crops will fail, and that can eliminate some foods permanently from our diets. Viruses will mutate faster than humans to suit the new environment and will spread faster than they can be cured. Even the smallest change in earth’s axis can destroy the current climate

which, in turn, affects every animal, plant, virus or living bacteria in current existence (Attenborough, 2018).

So again, let's ask, is sea level rise so bad? Land will disappear, glaciers will melt, sea levels will rise even faster, underwater food chains will be destroyed, and the earth's axis may even change. Society will change and the problem of sea levels rising can only get worse from now.

References:

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Assistance

Parents – Interview about research and specialisation

Mrs Baume-Tarrant – Bounced ideas off and referencing direction