

SEA LEVEL RISE originally developed by Charlotte Woolliscroft

Core samples, tide gauge readings, and, most recently, satellite measurements tell us that over the past century, the Global Mean Sea Level (GMSL) has risen over 20 cm. Over the past century, the burning of fossil fuels and land use changes have released heat-trapping gases, greenhouse gases, into the atmosphere. These emissions have caused the Earth's surface temperature to rise, and the oceans absorb about 90% of this additional heat.



The rise in sea levels is linked to three primary factors, all induced by this ongoing global climate change:

Thermal expansion: When water heats up, it expands. About half of the past century's rise in sea level is attributable to warmer thermal expansion

Melting of glaciers and polar ice caps: Large land ice formations, like glaciers and the polar ice caps, naturally melt back a bit each summer. But in the winter, snows, made primarily from evaporated seawater, are generally sufficient to balance out the melting. Recently, though, persistently higher temperatures

caused by global warming have led to faster summer melting as well as diminished snowfall in some places. The meltwater eventually flows into the oceans, causing sea levels to rise.

Ice loss from Greenland and West Antarctica: As with glaciers and the ice caps, increased heat is causing the massive ice sheets that cover Greenland and Antarctica to melt at an accelerated pace. Scientists also believe meltwater from above and seawater from below is seeping beneath Greenland's and West Antarctica's ice sheets, effectively lubricating ice streams and causing them to move more quickly into the sea. Moreover, higher sea temperatures are causing the massive ice shelves that extend out from Antarctica to melt from below, weaken, and break off.

Consequences

When sea levels rise rapidly, as they have been doing, even a small increase can have devastating effects on coastal habitats. As seawater reaches farther inland, it can cause destructive erosion, flooding of wetlands, contamination of aquifers and agricultural soils, and lost habitat for fish, birds, and plants. When large storms hit land, higher sea levels mean bigger, more powerful storm surges that can strip away everything in their path. In addition, hundreds of millions of people live in areas that will become increasingly vulnerable to flooding. Higher sea levels would force them to abandon their homes and relocate. Low-lying islands could be submerged completely.

Source: <http://ocean.nationalgeographic.com/ocean/critical-issues-sea-level-rise/>



FUTURE PREDICTIONS (below)

(above) DISTRIBUTION OF HAZARD

- Predicted sea level rise of up to 1.6m by 2100. 230 million people around the world live less than one metre above sea level.
- Melting of Greenland's ice would cause a 7m rise in sea level. This could happen with a 2 to 4°C rise in temperature.
- There will be an increase in the frequency and intensity of storms



(Left) Low-lying coral atoll islands, such as Tuvalu (Pacific) are at high risk. (Centre) Greenland's ice sheet calving into the ocean. (Right) Low-lying cities such as Venice (photographed) and New York will have to plan for rising sea levels.