

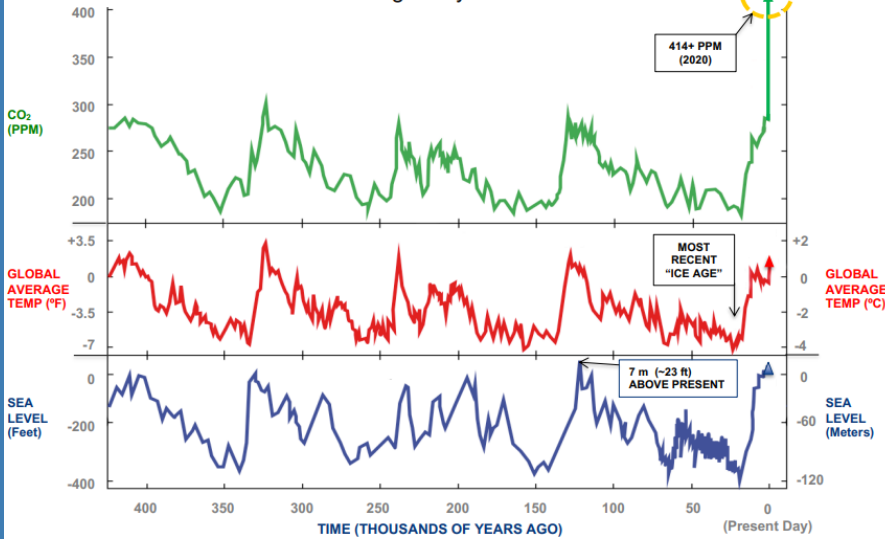
# Sea Level Rise

Consensus amongst scientists is that climate change is the direct result of human activity and intervention due to the combustion of fossil fuels, deforestation, and land use changes. Atmospheric concentrations of carbon dioxide are now higher than at any other point in the last two million years. Atmospheric Methane and Nitrous Oxide are at higher levels than any point in the last 800,000 years.

The chart below shows the last four ice age cycles. The graphs show the correlation between the level of atmospheric carbon dioxide (CO<sub>2</sub>) in parts per million (PPM), with global average temperature (relative to zero), and the rise and fall in sea-level. The green line (CO<sub>2</sub>) rises first, then the red line (global average temp), followed by the blue line (sea-level).

## Carbon Dioxide (CO<sub>2</sub>), Temperature, & Sea Level Move in Long-Term Synchronization

Four "Ice Age Cycles" Shown



Adapted from Drs. James E. Hansen & Makiko H. Sato / csas.earth.Columbia.edu

Modern recorded civilisations date back between 12,000 – 16,000 years. Early agriculture and farming, and the industrial revolution led to a huge increase in extra CO<sub>2</sub>.

Around 10,000 years ago at the tip of the last peak, our planet should have followed the previous trends and began a natural cooling period.

As CO<sub>2</sub> increases and the planet warms, global average temperature will increase, which will melt ice stored at polar regions and lead to an increase in sea-level rise.

Image: Adapted from Drs. James E. Hansen & Makiko H. Sato / csas.earth.Columbia.edu / www.johnenglander.net

## Did You Know

1. The **Greenland Ice Sheet** covers only 1.2% of the Earth's land surface but **stores around 7.4m** (approximately **25ft**) of global sea-level rise in ice which is going to melt.
2. The **Antarctic Ice Sheet**, which covers 8.3% of the Earth's land surface, **stores around 58m** (close to 200ft) of sea-level rise.
3. It is estimated that a **rise in sea-level of 1m by the year 2100** would directly affect an estimated **410 million people living in coastal regions** around the globe.
4. When the **Greenland and Antarctic** ice sheets have completely **melted**, sea level will be **64m** (212ft) higher than it is today.

Nobody really knows how fast sea level will rise, it could take 300 or 3000 years for the polar ice to melt. However, many coastal populations will need to relocate and we will need to adapt as our coastlines change. Rising sea levels increase the risk of coastal flooding and erosion, and storm surges which pose significant threats to communities, infrastructure, and ecosystems.