

Glacial Ice Melting

About 10% of land on earth is covered in glacial ice with almost 90% in Antarctica and the remaining 10% is in Greenland. Due to temperature increases from climate change 95% of the oldest and thickest ice in the arctic is already gone.

Scientists project that if emissions continue to rise unchecked, the Arctic could be ice free in the summer as soon as the year 2040. Even if we reduce carbon emissions more than $\frac{1}{3}$ of remaining glaciers will melt by 2100.

The ice sheets are white and so reflect heat back into space, keeping us cool. As they melt they turn darker in colour and absorb heat instead of reflecting it. This means these areas no longer cool the earth.

What happens if ice sheets aren't reflecting heat into space?

What happens to all the water as the ice sheet and glacier melts?

The Greenland and Antarctica's ice sheets are the largest contributors to sea level rise. Greenland's ice sheets contribute to 20% of current sea level rise. If all Greenland's ice melts it would raise sea levels by 20 feet.

The glacial melt is changing the circulation of the Atlantic Ocean and making changes to the jet stream. This impacts on the fish needing cooler waters and produces more destructive storms.

What will glacial melt mean for our oceans and weather?

Sea levels rising

Climate change causes sea levels to rise in two ways: melting glacial ice sheets and the process of thermal expansion. Thermal expansion is when water expands as it heats up.

Increased sea levels will lead to devastating impacts for communities and ecosystems. Extreme weather caused by higher and warmer seas will cause regular flooding. Flooding will destroy coastal communities and habitats by eroding coastlines and destroying livelihoods and wildlife.

If sea levels increase by 1m and populations don't grow, 410 million people will be at risk. 8 of 10 largest cities are coastal with Mumbai, Shanghai, New York and Osaka-Kobe being some of the most vulnerable.

Which areas are most at risk from sea level rises?

What will the wider impact of sea level rise be?

Flooding is already causing people to migrate to higher ground or flee to other nations. Coastal communities and habitats risk damage and destruction as the cost of flooding could reach \$35,000 billion by 2070.

Sea levels have risen by 25cm since 1880 and the rate of sea level rise is increasing. If carbon emissions aren't reduced average sea levels could rise by 2.2m by 2100.

How much is sea level predicted to rise in the next 80 years?

Temperature Increases

Warmer temperatures alter our seasons and weather patterns as the atmosphere can collect, retain, and release more water making wet areas wetter and dry areas drier, leading to more storms, droughts and floods.

Higher temperatures impact on the behaviour and lifecycles of plants and animals. For those unable to adapt extinction rates will increase and reduce biodiversity impacting agriculture.

Increasing temperatures will require people to adapt as heat impacts our health with children and the elderly being the most vulnerable. Scientists predict increases in pests, invasive species, and certain human diseases

Oceans absorb 90% of extra heat generated by humans but this leads to thermal expansion and sea level rise. The heating oceans mean coral reefs and fish die. It can also slow or change ocean currents and change climates.

Where is the warming happening most? Land or sea? What effects will this have?

What effect could this have on people?

Increasing temperatures will impact the livelihoods of people. Basic services like water and power as well as jobs, healthcare, infrastructure, education and agriculture will also need to adapt to the new climates and weather.

Every decade since the 1960s averaged hotter than the one before with the 2010s the hottest ever recorded decade. Predictions suggest temperature increases of between 1.1 to 5.4°C by 2100.

How will temperatures change in the next 50-100 years?

Extreme Weather Events

Rising temperatures in many places are facing longer, more frequent and severe droughts. Droughts reduce water levels in rivers and ground water, stunts plant growth, increases pest attacks and dust storms. Climate change increases the length and severity of wildfire season and expands the area at risk from wildfires. So regions not currently prone to fires could become risk areas.

As the atmosphere warms, air can hold 7% more water vapour for every 1°C rise in temperature. This will lead to an increase of 60% by 2100 in the severity and frequency of extreme storms and hurricanes. This increase in rainfall will lead to more frequent and severe flooding and flash floods.

The areas most at risk from droughts are areas in sub-Saharan Africa and the middle east. Extreme storms will impact areas in the tropics the most. However extreme weather will be more severe and frequent everywhere..

Which areas are most at risk from extreme weather?

What will the wider impact of extreme weather?

The wider impacts of extreme weather relate to the social threats to jobs and health. As well as the risk to the economy due to destruction of infrastructure. The cost of insurance could rise by 22% by 2040.

74% of natural disasters are caused by floods, storms, heatwaves, droughts and other weather related-events with climate change set to increase their frequency and severity.

What sorts of extreme weather will occur?

Water supply changes

More frequent, extreme flooding caused by climate change is polluting fragile water sources. Longer droughts dry up springs and other water sources increasing water scarcity globally.

An increasing global population place high demands on farming and increased water pollution and increased wealth (more people living water-intensive lives) are worsening this water scarcity.

Droughts mean people have to walk further to find water. Often the only water available is dirty, which makes people sick and spreads waterborne-diseases such as cholera.

Current predictions state that water scarcity will displace between 24 million and 700 million people by 2030.

In places like Bangladesh, Ethiopia and Mozambique droughts mean farmers' crops are more likely to fail and cattle risk dying, so they have less produce to sell and families have less food to eat.

What does a lack of rainfall mean?

What does too much rainfall mean?

Floods can destroy people's crops, toilets and homes, and they can contaminate drinking water sources, damaging people's livelihoods, their dignity, their safety and health.

90% of all natural disasters are water-related.

By 2040 one in four children will be living in areas of extremely high-water stress.

How much is sea level predicted to rise in the next 50 years?