



10 Minutes for the Planet
Ice and a glacier slice ©
by Sarah Heath

Hello! I'm Sarah Heath and you're listening to 10 Minutes for the Planet on English Waves.

Glaciers exist on all seven continents and it is estimated that there are just under 200,000 of them across the globe. Covering 10% of the total land area worldwide, a huge percentage is located in, or near, the poles but glaciers are also found in many mountainous regions. In total, ice covers 706,000 square kilometres across the planet. They build up from fallen snow which is gradually compressed into huge masses of ice – some of which grow to hundreds of kilometres long and, in parts of the Antarctic, to nearly five kilometres thick.

They are living, moving natural phenomena, changing to the rhythm of the seasons. Their behaviour is not unlike a very, very slow-moving river: the Jakobshavn Glacier in Greenland holds the world record for moving at a speed of 45 metres per day! In the summer, the sun's heat causes them to melt and shrink in size but then the cold in winter reverses the process and the glacier regains the mass lost in the warmer months. But since the 1980s, glaciers have not managed to fully grow back to their original size. By just how much has not been fully understood until now.

Worrying new research by a team of glaciologists from the University of Zurich has new evidence which now shows that glaciers are shrinking at an alarming rate, one which is much faster than a 2013 study suggested. A huge 18% faster. This rise equates to 335 billion tons of ice each year, which is just disappearing.

The vast project studied 19,000 of the world's glaciers through both field research and with the help of satellite imagery and reached the conclusion that it has been in the past 55 years that glaciers across the globe have noticeably diminished in size. This corresponds with changes to the world's climate proving that the two are inextricably linked.

Scientists drill into the ice and extract ice cores from deep within the glaciers. These samples are then studied which reveals information, mostly from trapped air bubbles, about the atmospheric composition and temperature changes throughout the years. In recent times, ice core samples are showing that there are progressively higher levels of carbon dioxide and methane in the atmosphere, key components in global warming.

Glaciers hold roughly 70% of the world's freshwater within their mass – hence their vital importance. Other freshwater sources, such as lakes and rivers make up a mere 0.5%. And the world's ice masses are melting: 80% of the glacier on Mount Kilimanjaro has disappeared in the last century; the glaciers in India and the Himalayas are melting so quickly that scientists believe that they will have gone entirely by the year 2035. At this rate, many mountain ranges, including the Alps, could see their glaciers disappearing completely by the end of this century: scientists in Switzerland have estimated that half of the Alps' 4,000 glaciers will have melted by 2050 and all will have lost at least half their mass in the same time frame – regardless of any cuts in carbon emissions between now and then.

When this is put together with the gradual demise of the ice sheets in Greenland and Alaska, the concerns for rising sea levels become all too apparent. The Intergovernmental Panel on Climate Change has reported that sea levels in the past 100 years have risen between 10-20 cms. The current rise rate is about 3.5mms each year, which is already having dire consequences on the world's coastlines. With so many people living in close proximity to the sea, the future could be devastating in both rich and poor countries alike. If glaciers melted in their entirety, the levels of the seas and oceans would rise by 70 metres. That would wipe out major cities such as Osaka, Mumbai and New Orleans.

With such a massive reduction in the availability of freshwater sources if the world's glaciers melt, the effects on agriculture, and hence the food chain, will be one of many catastrophic fallouts. This has a double-negative effect attached to it – the overall loss of access to freshwater through the glaciers melting, causing the subsequent rise in sea levels due to the melted ice masses. Seawater will encroach into freshwater aquifers such as the Nile Delta, the main water source for Egypt's arable farmers, rendering the country's already limited agricultural land, almost useless.

Another lesser-known concern is the re-release of radioactive materials from accidents such as the Chernobyl nuclear power plant in 1986. Scientists have studied how such material is stored in the top layers of glaciers to often much higher concentrations than in non-glacial areas. Once the glacier melts, these radionuclides may be released back into the environment, including into the food chain.

Action has to be taken now. Research shows that much of the increase in greenhouse gases contributing to global warming, took place as far back as the Industrial Revolution in the 1760s. Since then, human activity has increased the levels of carbon dioxide and other gases by 40%. If the planet is to stand a remote chance at preventing the loss of its chief source of freshwater, governments must make immediate changes to their environmental policies. As Jacques Yves Cousteau said, "We forget that the water cycle and the life cycle are one".

Tune in next week for more stories on the environment, here on English Waves.