Climate change notes and info:

Sources:

* <https://climate.nasa.gov/evidence/>
* [www.climate.gov](http://www.climate.gov)
* https://www.iucn.org/resources/issues-briefs/ocean-warming

In the last 650,000 years the Earth has gone through several stages of glacial retreat and advance

What is Climate Change:

Due to the increase in fossil fuel combustion, the concentration of greenhouse gases like CO2 in the atmosphere has been increasing rapidly. Mostly due to the industrial revolution.

Evidence for climate change:

Global temperature rises

The Earth’s temperature has risen about 1.18 degrees Celsius since the 1800s, due to increases in carbon emissions into the atmosphere. 0.08° C per decade to be exact. Due to the start of the industrial revolution and fuel being used more commonly for vehicles and transportation for example.

The majority of the warming took place within the past 40 years, in fact the most recent years were recorded as the hottest. 2020 was recorded as the second hottest year on record as the surface temperatures was almost 1 degree Celsius warmer than the 20th century average and 1.19 degrees Celsius warmer than before the industrial period. A new high temperature record was set on average every 13.5 years between the years 1900 and 1980s whereas a new record was set every 3 years between the years 1981-2019.

Warming oceans

The ocean absorbs a lot of heat due to the increasing concentration of greenhouse gases in the atmosphere over the years mainly due to the consumption of fossil fuels like coal, oil and natural gases.

A lot of the increased heat has been absorbed by the oceans resulting in the top 100 metres showing signs of warming of more than 0.33 degrees Celsius since 1969

90% of additional energy is stored in the ocean, in fact the IPCC revealed that in 2013 the ocean had absorbed 93% of the excess heat produced by greenhouse gases since the 1970s

The distribution of excess heat in the ocean is being concentrated in the southern hemisphere as it isn’t uniform which is resulting in the melting of the Antarctic ice shelves.

Ocean warming leads to a reduction of the oxygen dissolved in the water and the sea level rising due to ice melting and sea water expanding as a result of the additional heat being absorbed. Ocean acidification has become an issue as the pH of ocean is lowering due to the increased concentration of carbon dioxide which can damage ecosystems and marine species.

Shrinking Ice Sheets

Greenland lost an average of 279 billion tons of ice per year between the years 1993 and 2019 and Antarctica lost around 148 billion tons each year. This led to the ice sheets in the respective areas decreasing in mass. The total amount of ice lost in 1992-2018 was enough to raise the global sea level average by nearly 2 cm.

Glacial Retreat

Glaciers all over the world are retreating for example in Africa, the Alps, Alaska, Andes, Himalayas, Rockies

Decreased Snow Cover

Satellite observations reveal that in the northern hemisphere, snow is melting earlier and over the past 50 years, snow cover has decreased.

Sea level rise

Sea levels around the world has increased 20cm in the last 100 years. The rate of increase in the last 20 is double that of the last century and is slowly increasing annually.

Declining Arctic Sea Ice

The thickness and extent of the sea ice in the North Pole/Arctic is quickly reduced over the past several decades

Extreme Events

High temperature events in the US have been increasing whereas low temperature records have been decreasing since the 1950s. Increasing number of intense rainfalls has been occurring.

Ocean Acidification

Since the beginning of the Industrial period, the ocean’s surface has increased in acidity by nearly 30% due to the ocean absorbing the excess co2 being emitted by people. 20-30% of total CO2 emissions has been absorbed by the ocean