FACULTY OF ENGINEERING AND TECHNOLOGY

Lecture- 28

Climate change and global warming

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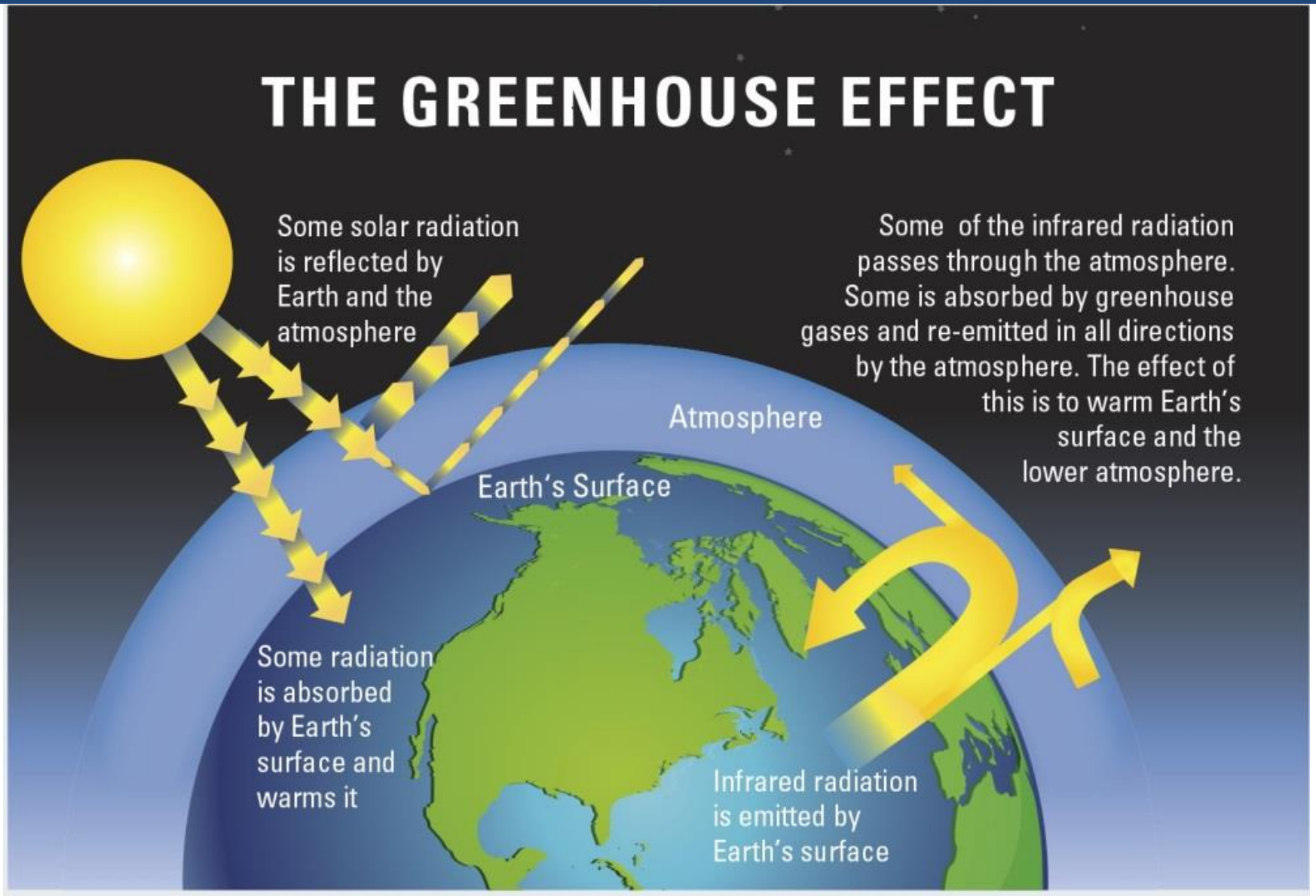
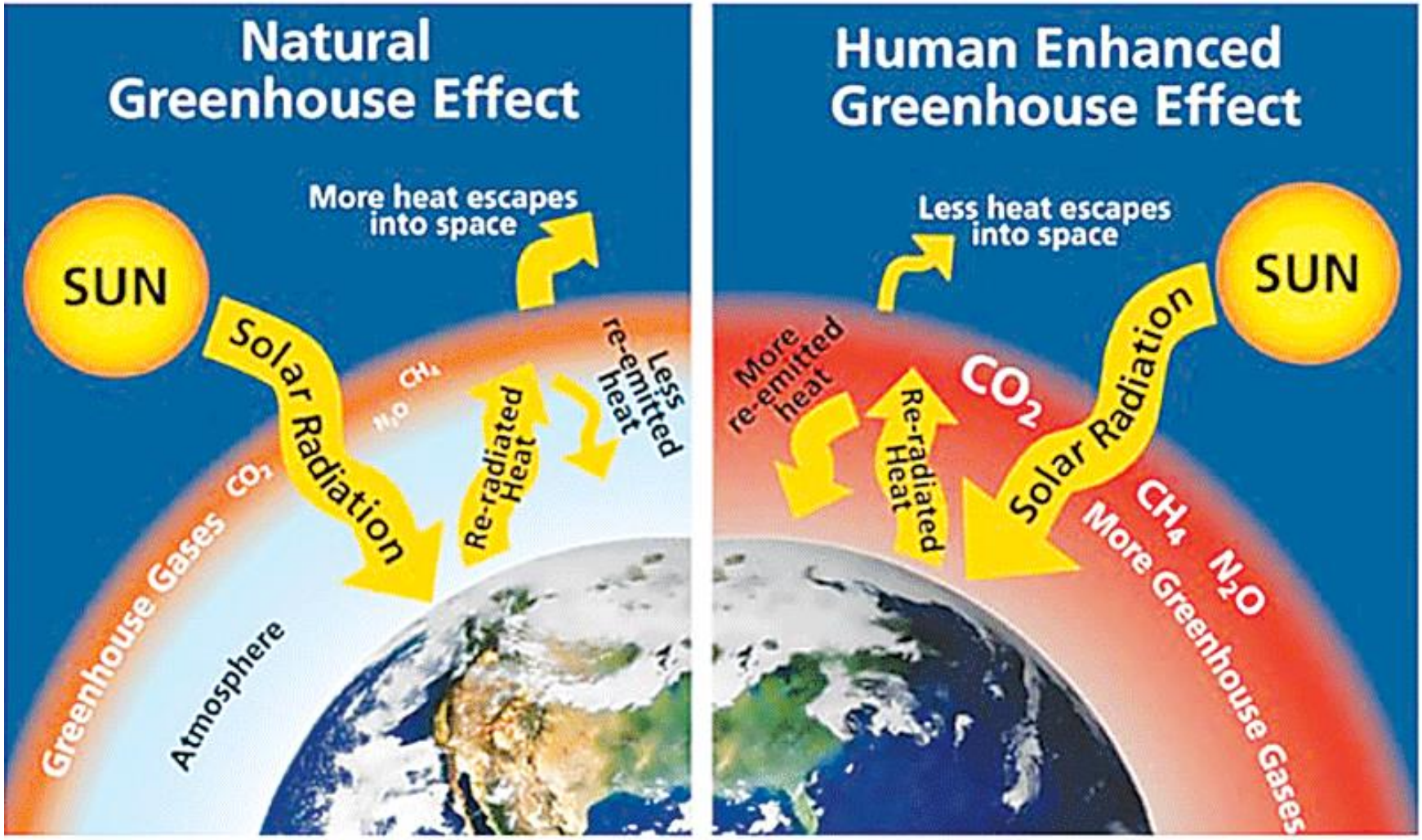
Greenhouse effect

- Human activities has resulted in increase in concentration of certain gases like carbon dioxide, nitrogen oxides, methane, water-vapor and CFCs.
- These gases are known as greenhouse gases as they behave like glass panels of greenhouse.
- The glass in a greenhouse allows solar radiation to enter and absorbed by the objects inside. After absorption, objects radiate heat in the form of terrestrial radiation having longer wavelength. The radiation with longer wavelength are not able to pass out through the glass. The heat is therefore trapped in the greenhouse increasing the temperature inside and ensuring the luxuriant growth of plants.
- Similar to greenhouse glass panels, these greenhouse gases trap heat in the form of infra-red radiation near the earth's surface and known as **greenhouse effect**.



Sources: https://royalsociety.org/topics-policy/projects/climate-change-evidence-causes/basics-of-climate-change/



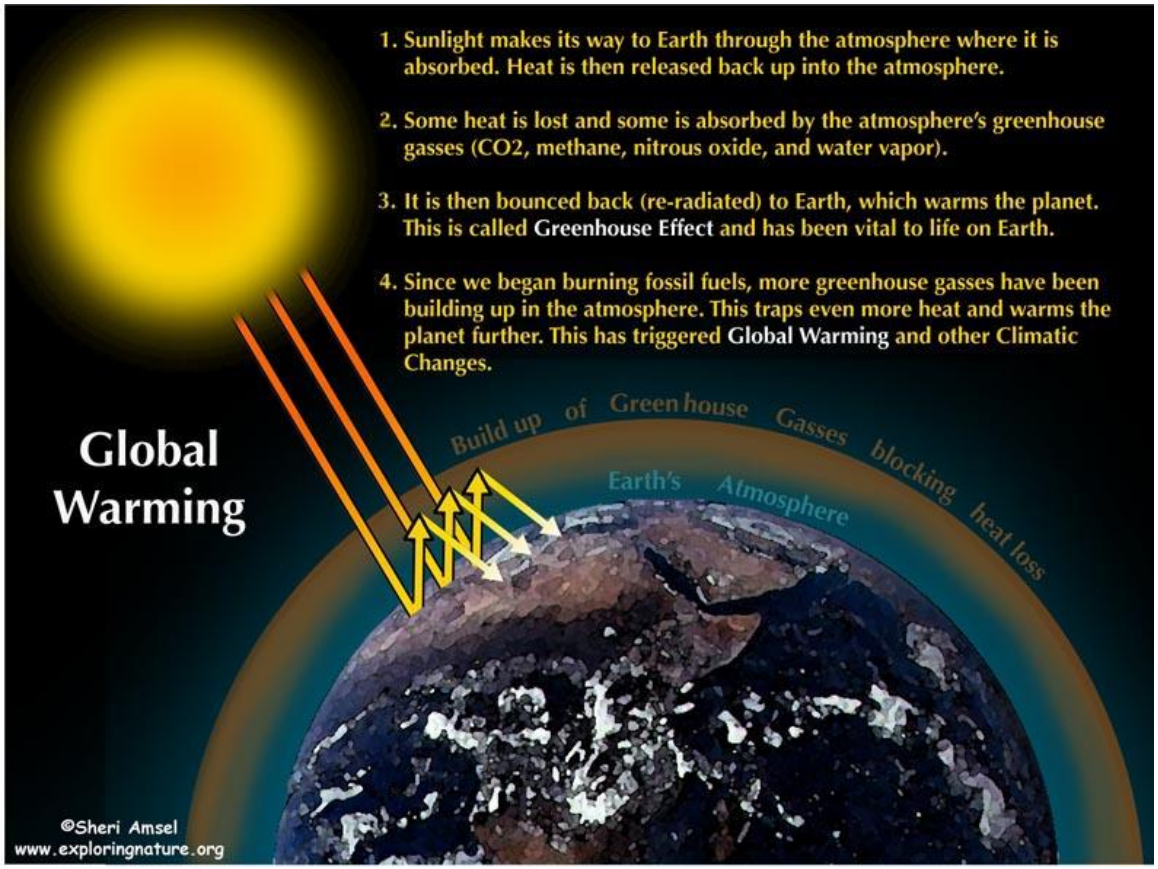
Sources: https://images.app.goo.gl/a25R5uL6MWuKipz76

Global warming

Anthropogenic activities such as burning of fossil fuels, etc. have increased earth's temperature due to increase in greenhouse gases and resulted in global warming.

Global warming refers to a increase in Earth's average surface temperature.

The amount of heat trapped in earth's atmosphere or potential of global warming depends upon concentration of greenhouses gases and their residence time.

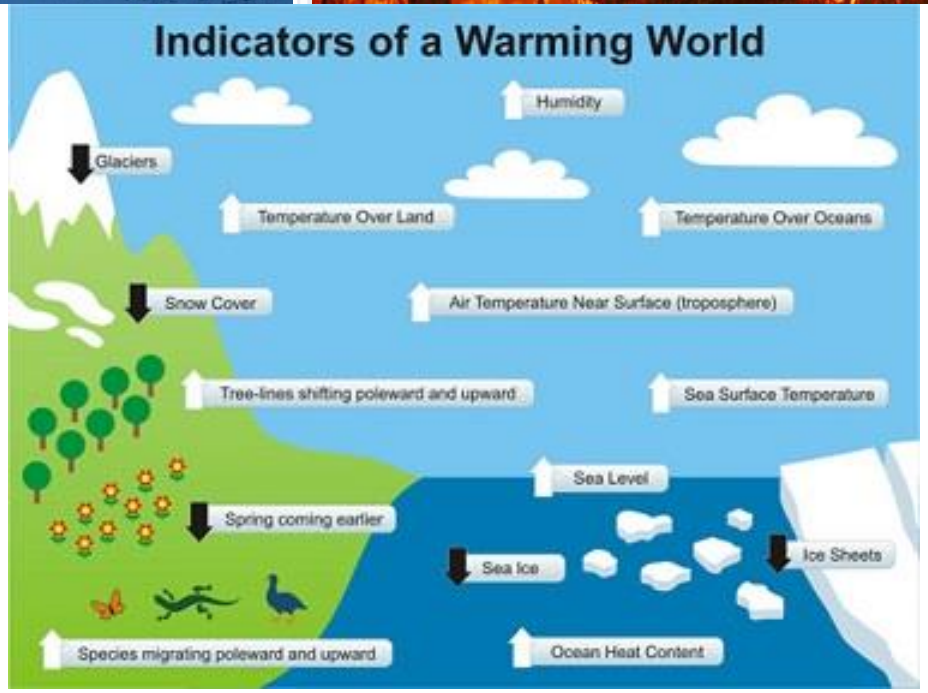


Sources: https://images.app.goo.gl/aEbXSYTPQgsfuqWb6

Effects of Global Warming

There could be several adverse effects of **global warming**.

- Global warming has altered earth's climate resulting in climate change.
- With a warmer earth the polar ice caps will melt causing a rise in ocean levels and flooding of coastal areas.
- Coastal countries or islands like Bangladesh, Maldives are at risk of inundation due to global warming. If the sea level rises by 3m, Maldives will submerge completely beneath the ocean water.
- The rise in temperature will result in decline in agricultural produce.
- Incidence of drought will increase and expand extent of desert.
- In the polar region's temperature rises caused by global warming would have disastrous effects. Vast quantities of methane are trapped beneath the frozen soil of Alaska. When the permafrost melts the methane that will be released can accelerate the process of global warming.
- Global warming leads to high temperature and drier condition that increase wildfire

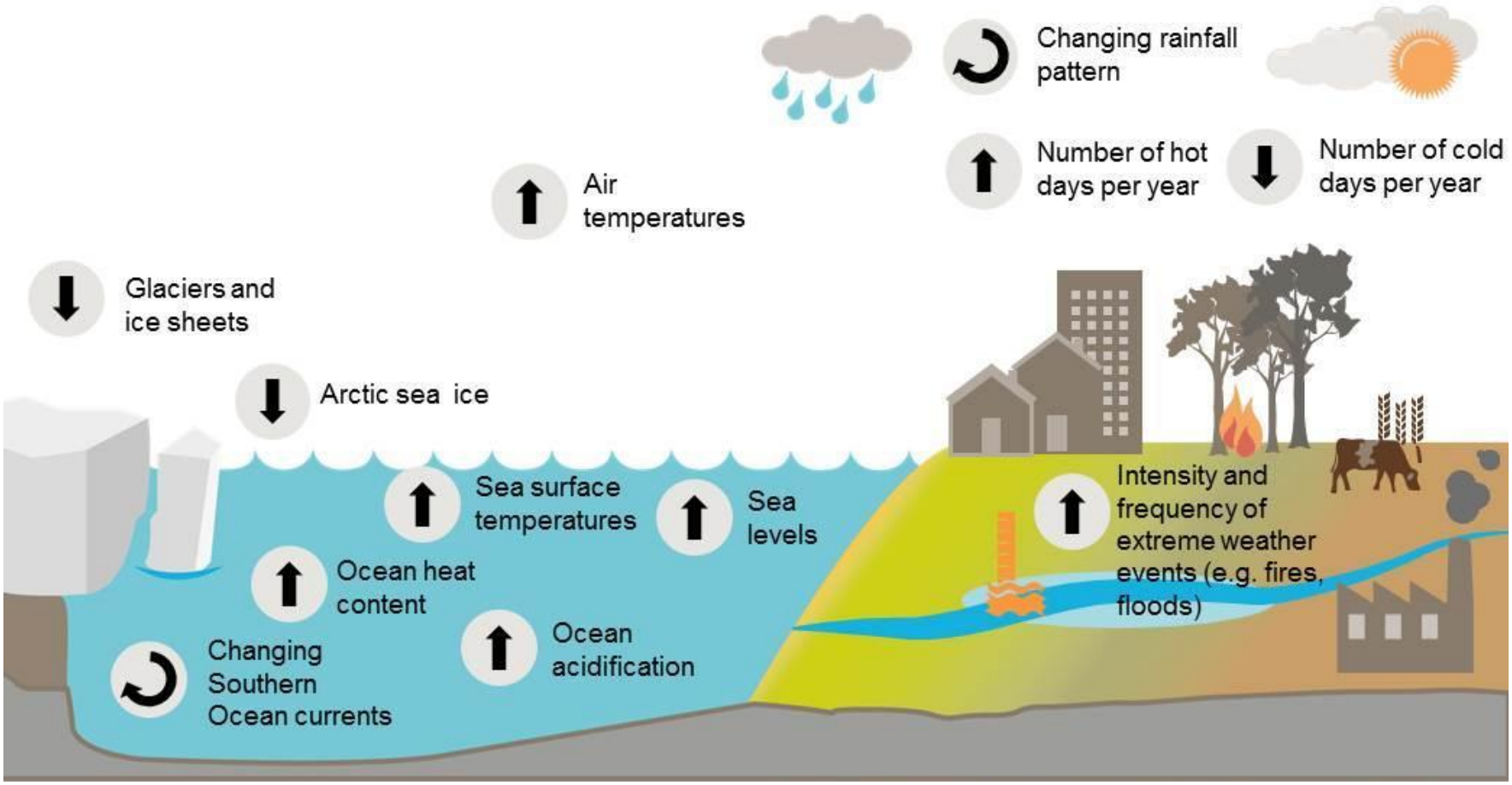


Sources: https://images.app.goo.gl/R3S86fj3yZXwWmYV7; https://images.app.goo.gl/4AFQwrLxsyEqNqvA6; https://images.app.goo.gl/xbhe3KAANeX7qtk66

Climate change

- Climate is the average weather of an area. It include general weather conditions, seasonal variations and extremes of weather in a region.
- Climate change is a change in the statistical distribution of weather patterns when that change lasts for an extended period of time (at least 3 decades).
- Increased greenhouse effect and global warming has caused climate change.
- Climate change may affect the hydrological cycle, resulting in floods and droughts in different parts of the globe, increasing sea level, affecting agriculture productivity, increasing human and livestock death troll.
- The global change in temperature will not be uniform effect all over the globe and will fluctuate in different regions. The places at higher latitudes will be warmed up more during late autumn and winter than the places in tropics.
- Poles may experience 2 to 3 times more warming than the global average, while warming in the tropics may be only 50 to 100% on an average. This will reduce the thermal gradient between the equator and high latitude regions decreasing the energy available to the heat engine that drives the global weather machine and disturb the global wind and ocean current pattern as well as the timing and distribution of rainfall.

There are multiple lines of evidence that show the climate system is changing



Sources: https://images.app.goo.gl/iKkAkzXWSDEuzkBh6


THANK YOU :)