

# Factors of Climate Change

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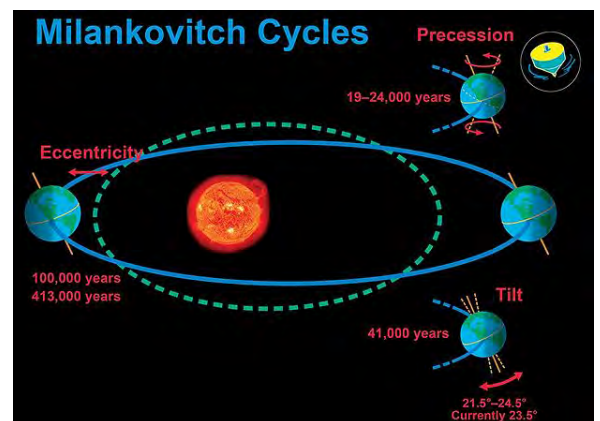
- Glacial landscapes have a low level of resilience; they are sensitive environments and thus vulnerable to physical and anthropogenic threats such as climate change.
- Throughout Earth's history, the climate has fluctuated between greenhouse and icehouse states. These two climatic states last for millions of years. Within the icehouse stage, glacial and interglacial periods occur which last for less than 1 million years.

### → Long Term Factors of Climate Change involve:

- Milankovitch Cycles: Milankovitch's theory of astronomical climate forcing states that global energy alters, forcing global changes due to the variation in the earth's orbit. These changes involve:

- a) Stretch/Eccentricity: The earth's orbit changes from circular to ellipse every 96000 years which changes the distance between the earth and the sun.
- b) Tilt: The Earth's tilt changes between 21.8 degrees and 24.4 degrees every 41000 years. If the tilt is greater, tropics receive more energy and thus become larger.

- c) Wobble/Axial Precession: Every 22000 years, the Earth's seasons change.



### → Short Term Causes of Climate Change involve:

- Variations in Solar Output: Energy output of the sun is not constant. Sunspots occur by magnetic storms, forming dark areas on the sun which increase solar output. The number of sunspots increase/decrease in an 11 year cycle. During the Medieval warming period, there were high numbers of sunspots but during the Maunder Minimum, there were few sunspots.
- Volcanic Eruptions: These can block sunlight, lowering global temperature and triggering mini ice ages. For instance Mount Tambora in Indonesia erupted in 1815 and lowered global temperature by 0.5 degrees Celsius.

- Other causes of climate change are anthropogenic, caused by human activities such as the combustion of fossil fuels, the destruction of carbon sinks and the use of dangerous chemicals which cause pollution.