

## Climate Change -- Part One

Greenhouse gases...Global warming...Climate change. These are terms we hear a lot about lately, and will continue to for many years to come. They are scientific terms...but have also become significant and controversial economic and political issues as well.

Climate change has been occurring since the beginning of the planet Earth, now estimated by scientists to be around 4.6 billion years old. The reasons for climate change are many and complex, often not well understood, and probably some reasons for climate change have yet to be discovered. These reasons fall into at least 3 main categories: Astronomical, Geological, and Man-made. Many of these are occurring on specific cycles that vary from a few years to hundreds of thousand years. Others have no cycles at all, while yet others occur as random events.

Changes in the earths orbit around the sun, the Earths wobble, and tilt on its' axis are responsible for many large long term climate changes. Variations in the suns output including sunspot changes, are on much shorter cycles. Geologic changes such as Continental drift have no cycle, but are continually, but very slowly taking place. Volcanic Eruptions have no cycle either, but can cause very sudden climatic change. Similar sudden climate changes have occurred due to collisions between Earth and meteors, asteroids, and comets. In the era of the human race, most climatic changes have been a result of either land-use changes, or emissions of gas and solid particles into the atmosphere.

How do we know that the climate changes? Instruments have measured recent changes, but their period of record is short, 300 years at best, and usually not much more than 100 years old. Shipping logs, diaries, crop harvest and price records can take us back hundreds of years, as do records of sea ice extent, and size of glaciers . Tree rings, coral reefs, ice core and ocean sediment samples take us back much farther, hundreds of thousands of years. In the next issue of Under the Big Sky, we will look in more detail at how the climate has changed from the Earths beginning.