

We are all curious about what future climates will be like, especially with climate change in the news so much lately. To better understand climate change, we will begin by looking back to what we know about the past.

The Earth is estimated to be about 4.6 billions years old. Very little is known about the Earths' climate for its first 2 billion years, but it is believed to have been very warm for the most part. This time period averaged about 18 degrees warmer than the current average temperature, a time when the first life forms appeared nearly 3 billion years ago. This was followed by a very cold period that occurred between 2.7 and 1.8 billion years ago, when glaciers and ice were widespread across the face of the Earth.

Between 1.0 billion and 65 million years ago, there were numerous major shifts in climate that brought the Earth back and forth between widespread tropical conditions to widespread ice and glaciers. Most of these changes though took many thousands of years to complete. At the time of the dinosaur's extinction 65 million years ago, the earth was as warm as it has ever been, with even the north and south poles in hot tropical climates that were much the same as at the equator.

Between 65 million years ago and 1.6 million years ago, there was a steady cooling trend that culminated in a very cold period that lasted from 1.6 million years ago to just 18,000 years ago. During this period there were at least 7 distinct ice ages, where as much as one third of the Earths' surface was covered by ice. Ice was 10,000 feet thick in what would now be the northern U.S., and sea level was 30 feet lower than it is now. But even so, there were numerous shorter interludes where the climate was much warmer.

A dramatic warm-up occurred between 18,000 and 10,000 years ago, ending the last ice age. Note that the last of these "ice ages" was relatively recent, considering the estimated 4.6 billion year time frame of the Earths' history, and occurring at a time when human civilizations were becoming established in many locations.

For the most part, this warm-up continued until about the year 1400. Then, between about 1400 and 1850 A.D., we were in what is commonly known as "the little ice age," a time when the Earth cooled slightly.

From 1850 until 1940, the warming resumed. Then it cooled slightly again between 1940 and 1980. The warming since around 1980 though appears to be much more dramatic than at any time in the past several hundred years.