

CLIMATE CHANGES SINCE THE LAST ICE AGE

13,000 BC: The last of several Ice Ages reaches a peak, with continental glaciers covering much of the polar and sub-polar land areas of the world. In North America, all of New England and Michigan, all of the Great Lakes area, most of Ohio, Indiana, Minnesota and North Dakota lie under thousands of feet of ice. An estimated nine million cubic miles of ice is tied up in these global ice sheets. The average surface temperature of the Earth is estimated at roughly 11° F cooler than at present. The sea level of the world ocean lies more than 300 feet lower than at present.

13,000BC to 4,000 BC: Global warming (causes unknown) starts. The ice sheets melt, sea levels rise. Some source or sources of heat causes roughly nine million cubic miles of ice to melt in approximately 9,000 years. By 7,500 BC, the last of the Northern European ice sheet leaves Scandinavia. By 5,500 BC, the last of the North American ice sheets leave eastern Canada. This warming was neither steady nor everywhere the same. There were periods when mountain glaciers advanced, and periods when they retreated. These climatic changes varied widely from place to place, with some areas being affected while others were not. The warming trend was global and obvious, but very uneven.

5,600 BC to 2,500 BC (The “Global Optimum Period”): By 4,000 BC, world surface temperatures were 5° to 6° warmer than at present. The Arctic Ocean was ice-free during the summer months. Mountain glaciers had disappeared from the Norwegian mountains and the Alps in Europe, and from the Rocky Mountains of the United States and Canada. The world ocean was some ten feet higher than at present. Much of the present Sahara Desert had a moister savanna-like climate, with giraffes and other savanna species of wildlife. It is speculated that this warm period gave rise to civilization.

4,000 BC to 900 AD: Global cooling (causes unknown) starts. The Arctic Ocean eventually freezes over all year around, and mountain glaciers form once more in the Rocky Mountains, Norway, and the Alps. The Black Sea freezes over several times, and ice forms on the Nile in Egypt. Northern Europe gets much wetter, and bogs return to previously dry areas. Sea level drops to roughly its present level. World surface temperatures were about one to two degrees cooler than present.

1000 AD to 1500 AD (“Middle Ages Warm Period”): This period showed a rapid, but uneven, warming of northern hemisphere climates. The North Atlantic becomes largely ice-free and allows wide-spread Norse exploration as far as North America. Norse colonies in Greenland export crop surpluses to Scandinavia. Wine grapes thrived in southern Britain. Temperatures were from 2° to 10° warmer than at present. The period lasted only a brief 500 years. By 1,500 AD, it had pretty much vanished. The causes of the warming period and the causes of its disappearance are both unknown. It is speculated that this warm period gave rise to the Renaissance.

1430 to 1880 AD (The “Little Ice Age”): This is a period of rapid but uneven cooling of northern hemisphere climates. Both Alpine and Norwegian glaciers advance to their farthest extent in post-Pleistocene times. Northern forests disappear, to be replaced with tundra. Severe winters characterize much of northern Europe and North America (much to the dismay of the early American settlers). Canals and rivers ice over, snowfalls are heavy, and summers short and cool. World surface temperatures were about 1° to 3° cooler than present. In the US, the year 1816 is widely known as the “year with no summer”. Snow falls in New England in June. Widespread crop failures and deaths due to hypothermia are common. Causes of this cooling period are unknown.

1880 AD to 1940 AD: Warming trend (causes unknown). Mountain glaciers recede and summer ice in the Arctic Ocean begins to melt once more.

1940 AD to 1977 AD: Cooling trend (causes unknown). Temperatures are cooler than at present. Mountain glaciers stop receding, and some start to advance. Global temperatures diminish slightly despite increases in carbon-dioxide concentrations. Tabloids warn of coming widespread catastrophes due to “New Ice Age”.

1977 AD to 1998 AD: Warming trend (causes unknown). 1998 is the warmest year since the Middle Ages. Tabloids warn of coming widespread catastrophes due to “global warming”.

1998 AD to 2010 AD: Cooling trend (causes unknown). Global temperatures diminish slightly despite increases in carbon-dioxide concentrations.