

# Arctic Temperature Trends Summary

Science-based analyses of America's key environmental issues

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**Claim:** *The earth's Polar Regions, including the Arctic, are experiencing an unprecedented, dramatic and accelerated 20<sup>th</sup> century warming due to gradual CO<sub>2</sub>-induced global warming.*

**Response:** The fundamental message of a summary of the most current literature is that study upon study of **real-world** Arctic temperature data, observations and variability records **conclusively demonstrate the opposite to be true.**

According to nearly all climate models, earth's Polar Regions should be the most sensitive and vulnerable areas of the planet to potential climate change; and warming and cooling epochs should be seen most clearly here and should also occur earlier than in other parts of the world. However, on balance, the region shows either **no recent warming, no historically unprecedented warming** or **does** show a **cooling trend**. Simply, the projected climatic changes computed for the enhanced greenhouse effect significantly differ from those **actually observed** because the temperature predictions produced by **numerical climate models are invalid**. Hence, there is **no need to invoke** rising atmospheric CO<sub>2</sub> concentrations as the cause of the more ordinary climate changes of the past century, or even those predicted for the future.

**Update:** In a 2004 study, [Briffa et al. \(2004\)](#) found that for *all* land area of the globe lying poleward of 20°N latitude the warmest period of the past six centuries occurred in the 1930s and early 1940s, well before the majority of the anthropogenic CO<sub>2</sub> emitted to the atmosphere. What is more, after anthropogenic CO<sub>2</sub> emissions *really* began to rise, the temperature of this huge region *dropped*, and dropped rather dramatically, although it recovered somewhat over the last two decades of the 20th century. Even then, however, its final value was still below the mean value of the 1400s and portions of the 1500s. Consequently, Briffa et al. say that these and other unsettling questions prevent them "from claiming unprecedented hemispheric warming during recent decades on the basis of these tree-ring density data alone."

**Greenland.** [Chylek et al. \(2004\)](#) studied three coastal stations in southern and central Greenland that possess almost uninterrupted temperature records between 1950 and 2000. They discovered that "summer temperatures, which are most relevant to Greenland ice sheet melting rates, do not show any persistent increase during the last fifty years." In fact, working with the two stations with the longest records (both over a century in length), they determined that coastal Greenland's peak temperatures occurred between 1930 and 1940, and that the subsequent decrease in temperature was so substantial and sustained that current coastal temperatures "are about 1°C below their 1940 values." Furthermore, they note that "at the summit of the Greenland ice sheet the summer average temperature has decreased at the rate of 2.2°C per decade since the beginning of the measurements in 1987."

**Alaska.** Kaufman et al. note that Alaska averaged 3°F warmer than present for 2,000 years, from 9,000 to 11,000 years ago.

**Chukchi Sea shelf.** A 10,000-year perspective by Darby et al. (2001) reveals that in the recent past the Western Arctic Ocean was **3-7°C warmer** than it is today, with "no evidence the air's CO<sub>2</sub> concentration was either higher or fluctuating wildly during this period."

**Central Alaska and Yukon.** According to Muhs et al. (2001), during the prior interglacial these regions experienced summers **3-5°C higher than present**, when CO<sub>2</sub> concentration was much lower. Jorgenson et al. (2001) find a 300-year record of permafrost degradation **absent of any evidence** of a dramatic, accelerated 20<sup>th</sup> Century warming.

*Northern Quebec.* A 4,000 year perspective by Kasper and Allard shows warming from about 1900-1945, and a **cooling** for the last five decades. Arseneault and Payette (1997) report the interval between 860 and 1000AD was about 1°C warmer than today.

*Sibera.* Naurzbaev and Vaganov (2000) developed a 2200-year temperature that record shows present warming is “**not extraordinary.**”

*Baffin Island, Canada.* Moore *et al.* (2001) derived a 1240-year record from AD 750 to 1990. The warmest decade ended about 1220. Beginning in the 1960s, **colder** conditions prevailed until the end of the record, where alarmist claim there should have been dramatic warming.

*Asian Subarctic.* A 600-year temperature record by Vaganov *et al.* (2000) shows a 130-year warming trend from about 1820-1950 (lower CO<sub>2</sub>) and **cooling trend** for the last 50 years (higher CO<sub>2</sub>).

*Eurasian Arctic.* Zeeberg and Forman (2001) found that summer temperatures on Novaya Zemlya island in the four decades since 1961 have been 0.3 to 0.5°C **colder** than the prior 40 years, while winter temperatures have been 2.3 to 2.8°C **colder**. These observations, the authors note, are “counter to warming predicted for the twenty-first century by climate models.”

*The Greenland Sea.* Comiso *et al.* (2001) depict temperatures on Jan Mayen Island as **cooling** 0.15°C per decade over the past three-quarters of a century.

#### **References:**

Briffa, K.R., Osborn, T.J. and Schweingruber, F.H. 2004. Large-scale temperature inferences from tree rings: a review. *Global and Planetary Change* 40: 11-26.

Chylek, P., Box, J.E. and Lesins, G. 2004. Global warming and the Greenland ice sheet. *Climatic Change* 63: 201-221.

All other full literature citations can be found at: <http://www.co2science.org/subject/a/summaries/arctictemptrends.htm>