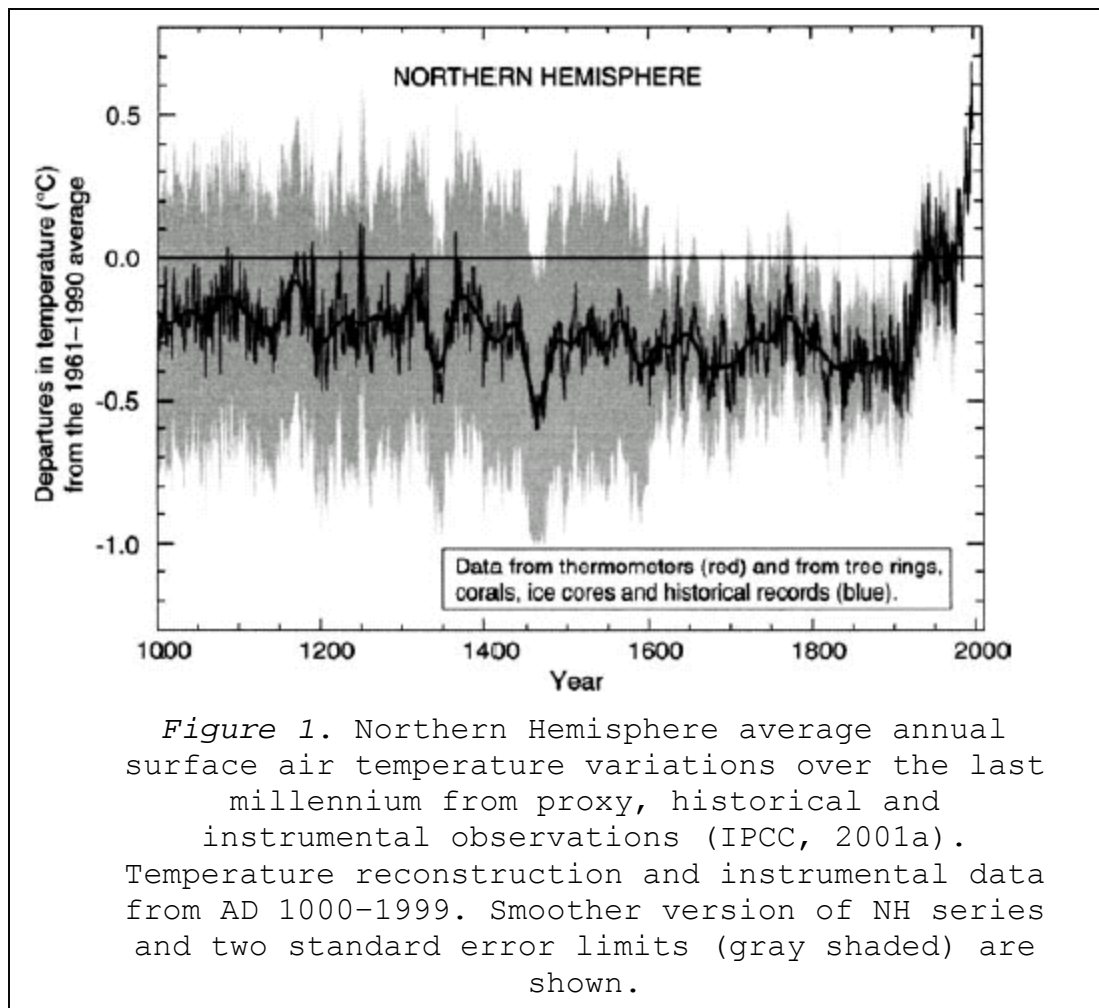


Excerpt from:

CLIMATE VARIABILITY AND CHANGE: PAST, PRESENT AND FUTURE – AN OVERVIEW

M. JAMES SALINGER, *Climatic Change* (2005) 70: 9–29

The course of annual average temperature change for the Northern Hemisphere over the past 1,000 yr is shown in Figure 1. This is a particularly important time frame for assessing the background natural variability of climate, to place 21st century changes in context of which both modern and traditional agricultural and forestry systems developed over the past millennium.



Palaeoclimate proxy indicators (Folland et al., 2001) include tree rings, which provide precisely dated annual information, corals that provide information on past variability of the tropical and sub-tropical oceans and ice

cores from polar regions of Greenland and Antarctica, which can have annual resolution. Other information can be gleaned from borehole measurements, which provide broadscale temperature trends, historical documentary evidence particularly from Europe and China, and mountain glacier moraines providing evidence of past glacial advances.

From these sources there is enough evidence to reconstruct temperature patterns over the Northern Hemisphere back to AD 1000 (Folland et al., 2001). These reconstructions show a slow cooling peaking around AD 1450 and 1880 over the last 1,000 yr, with the most recent cool period being around the end of the 19th century. Lamb (1982) has documented the downturn of climate in the North Atlantic/European region commencing with the storminess and cooling and wetness of 14th century Europe. Desertion of farms and village settlements are noted all over northern and central Europe. The prevailing wetness led to more prevalent disease. During the late 1500 s many years of general death and famine occurred in Scotland. For Norway extremely stormy years are noted in the 1600 s with changes in fisheries around Scandinavia.

Documentary evidence by Pfister et al. (1999) illustrates the impacts of climate excursions of similar magnitude (of the order of 0.2 °C) that occurred in late 16th century Europe on agricultural commodity prices and wine production. A clear link is made with grain price fluctuations. Wine yields and prices show a more dramatic response. The interannual deterioration from 1586 to 1587 decimated yields, with wine prices jumping and beer sales tripling in the 1590s. It is interesting to note though that for the Northern Hemisphere the coldest period occurred in the late 15th century when temperatures were 0.5 °C below the 1961-1990 average.

Evidence for Southern Hemisphere temperature trends in past centuries is quite sparse. There is evidence of some large-scale hydrological changes, which are best documented by lake levels in Africa (Nicholson, 1989).