

THE 'HOCKEY STICK' CONTROVERSY

Both Medieval Warm Period and Little Ice Age have long been well established and documented with strong geologic evidence. *Georef* lists 485 papers on the Medieval Warm period (MWP) and 1,413 on the Little Ice Age (LIA) for a total of 1,900 published papers on the two periods. Despite all of this physical evidence of the global MWP, the IPCC 3rd report (Climate Change 2001) reassessed the MWP on the basis of statistical manipulation of tree ring studies by Mann et al. (1998) and concluded that neither the MWP nor the Little Ice Age were global climatic events. Mann's graph (Fig. 1A) became known as "the hockey stick" of climate change and was used in the 2001 IPCC report to assert that climate had not changed over the past 1000 years until man-made CO₂ began to rise. Geologists didn't take the 'hockey stick' seriously and thought that either (1) the trees they used for their climate reconstruction were not climate sensitive, or (2) the data had been inappropriately used. However, the 'hockey stick' was featured prominently in Gore's 2006 book and film, which were widely circulated along with the statement that throughout the entire history of human civilization and there has never been an environmental shift remotely similar to this until the rise of CO₂.

McIntyre and McKittrick (2003) evaluated the data in the Mann paper and concluded that the Mann curve was invalid "due to collation errors, unjustifiable truncation or extrapolation of source data, obsolete data, geographical location errors, incorrect calculation of principal components and other quality control defects." Since then, emails and data disclosed in the Climategate scandal have revealed how the data was manipulated.

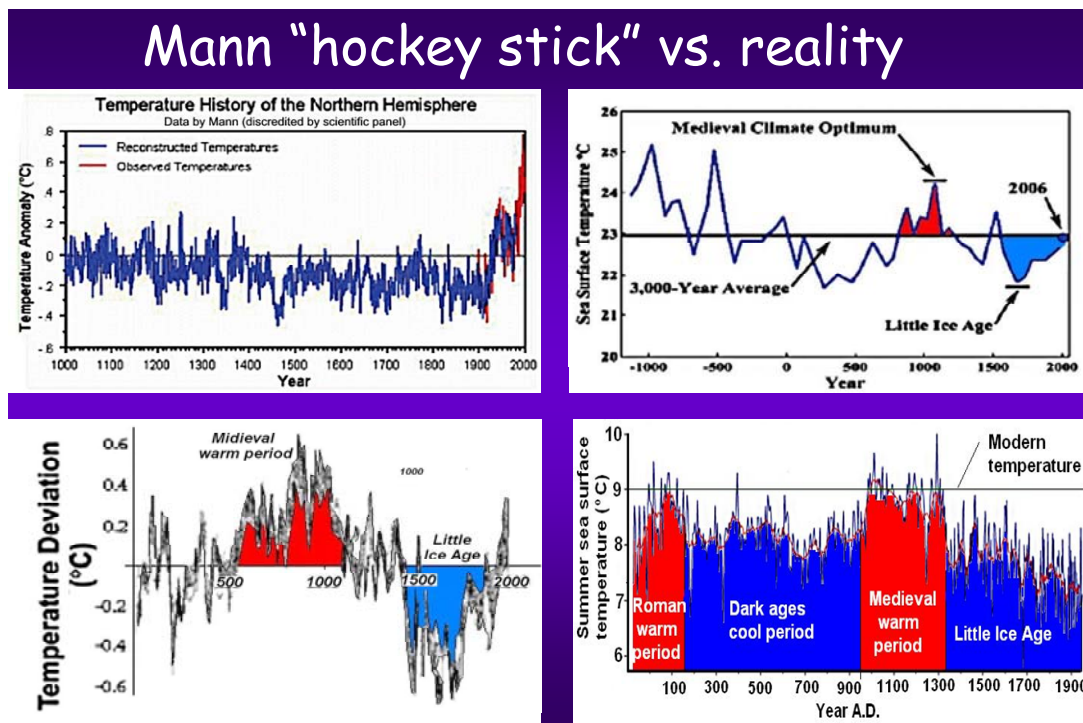


Figure 1. Comparison of the Mann et al. (1998) 'hockey stick' graph (upper left) with surface temperatures of the Sargasso Sea reconstructed from isotope ratios in marine organisms (upper right) (Keigwin, 1996), reconstructed paleo-temperatures without tree ring data (lower left) (Loehle, 2007), and summer sea surface temperatures near Iceland. (Sicre et al., 2008).

As shown by the three examples in Figure 1, as well as in 1,900 published papers, the Medieval Warm Period and Little Ice Age most certainly happened and the Mann et al. 'hockey stick' is not supported by any credible evidence.