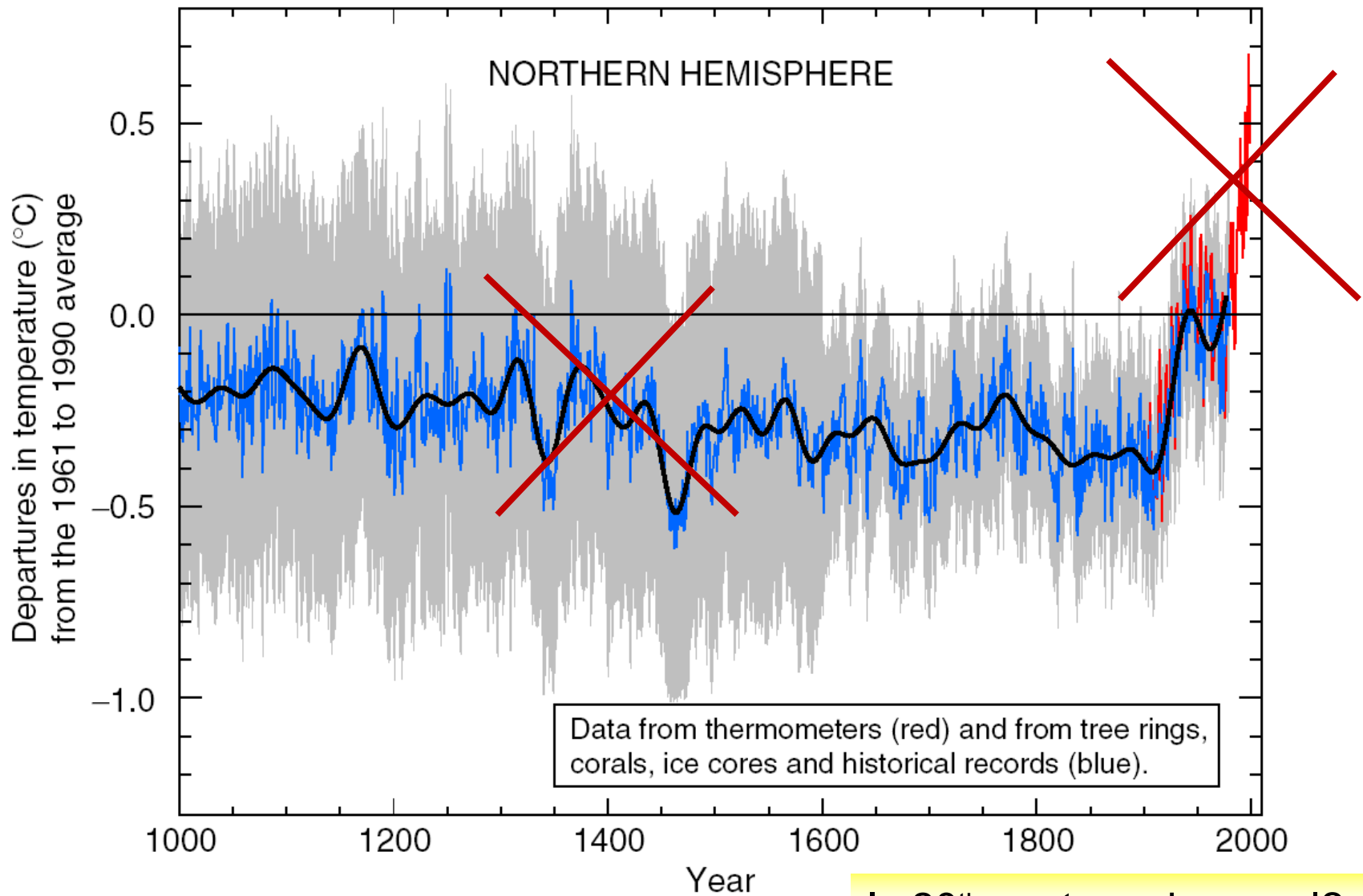


The need for diversity in the perspective:
The case of temperature data,
as an example.

Kiminori Itoh (伊藤公紀)
Yokohama National University (横浜国立大学)

Estimating past temperatures



Hockey stick curve of M. Mann et al.

Is 20th century abnormal?

Inappropriate data and mathematical procedures (“short centering” in primary component analysis), according to Steve McIntyre

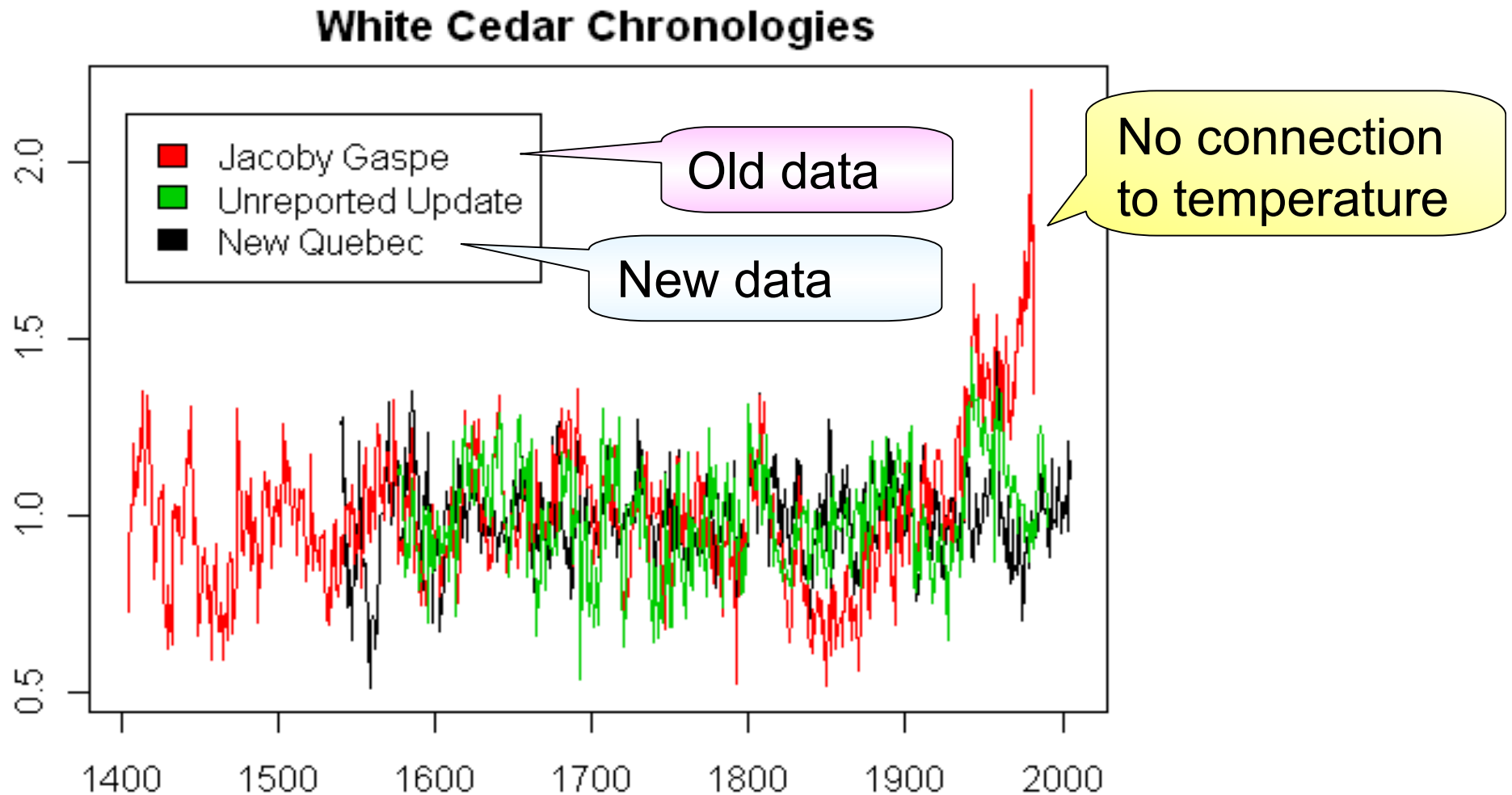
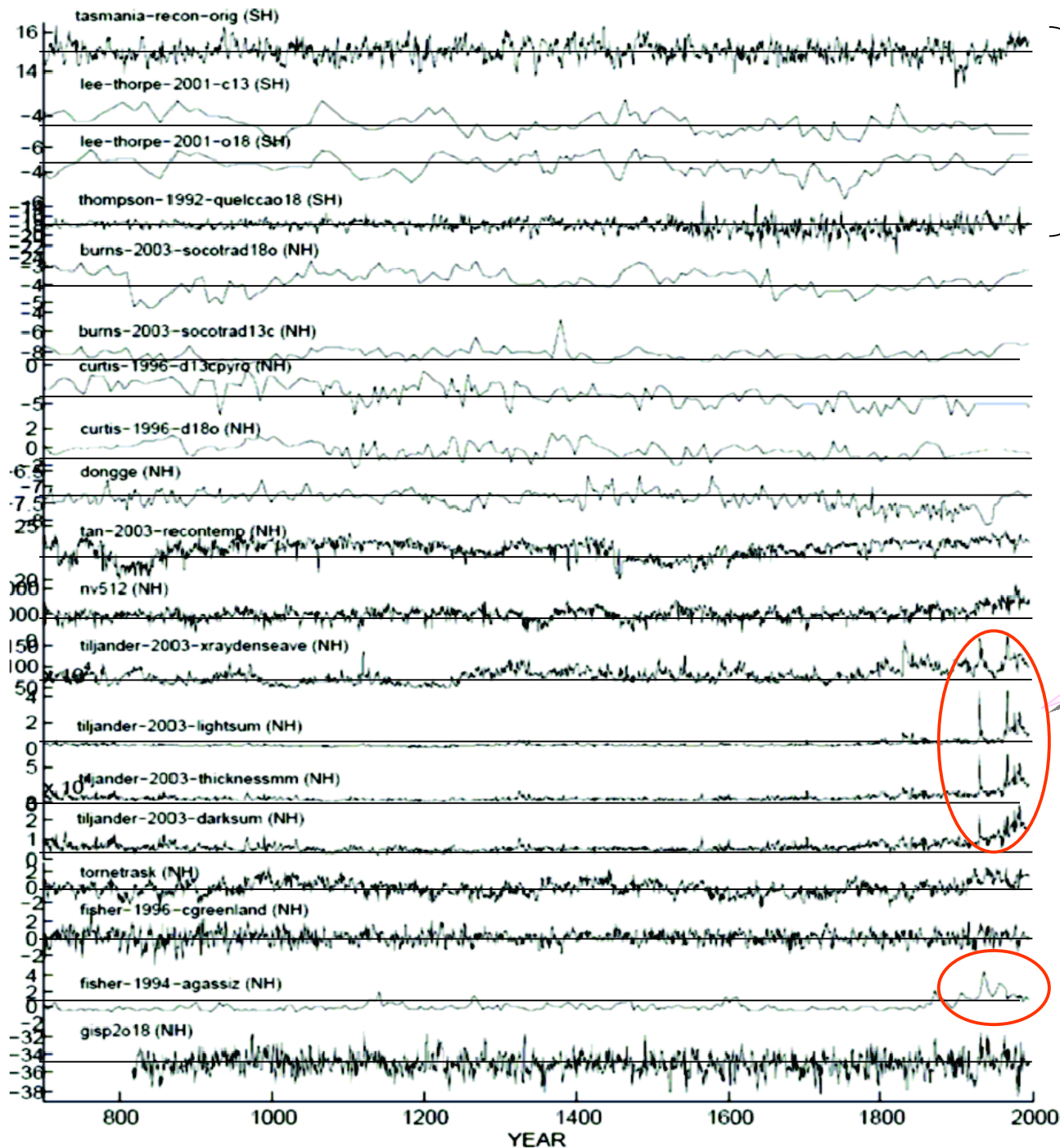


Figure 1. Three Quebec White Cedar Chronologies

http://www.climateaudit.org/wp-content/uploads/2008/09/gaspe_8.gif



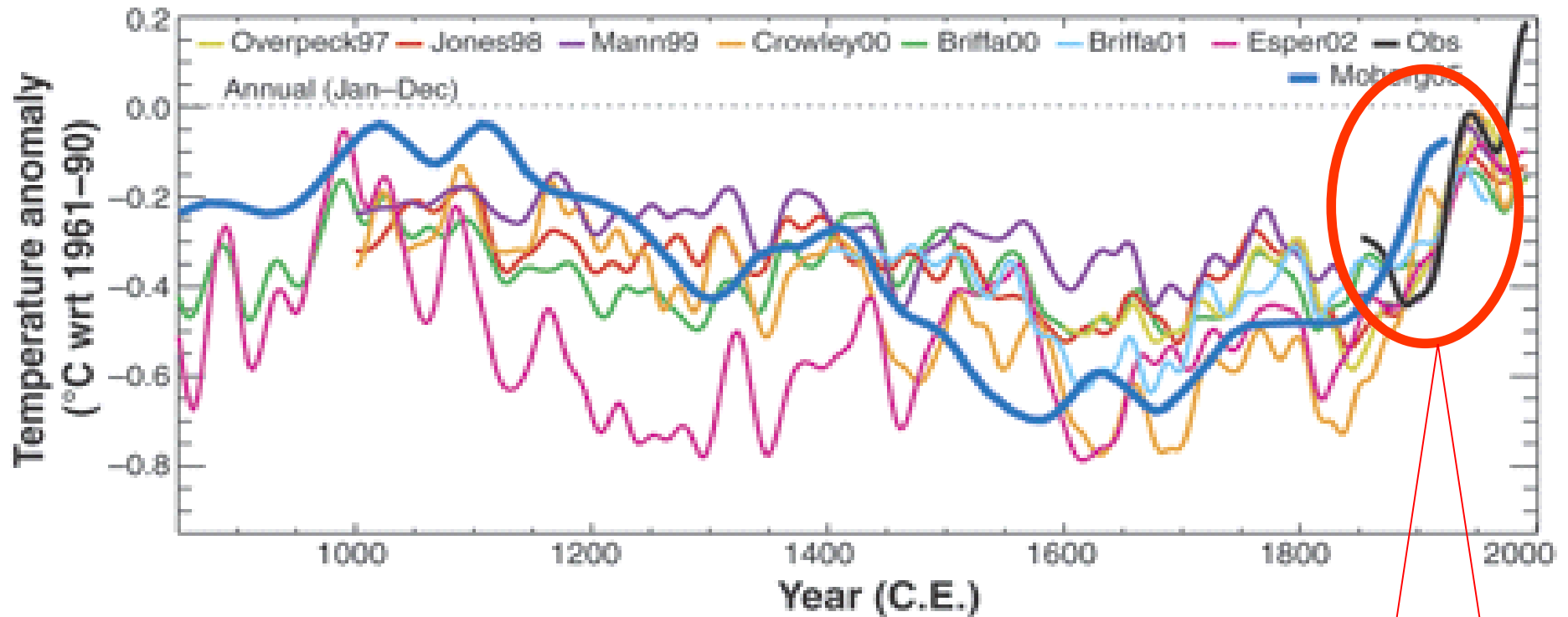
Southern Hemisphere

Original data for reconstructing paleotemperatures

Upside-down !!

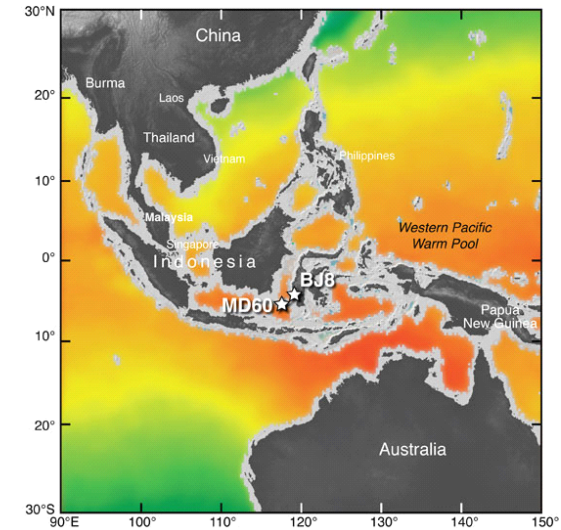
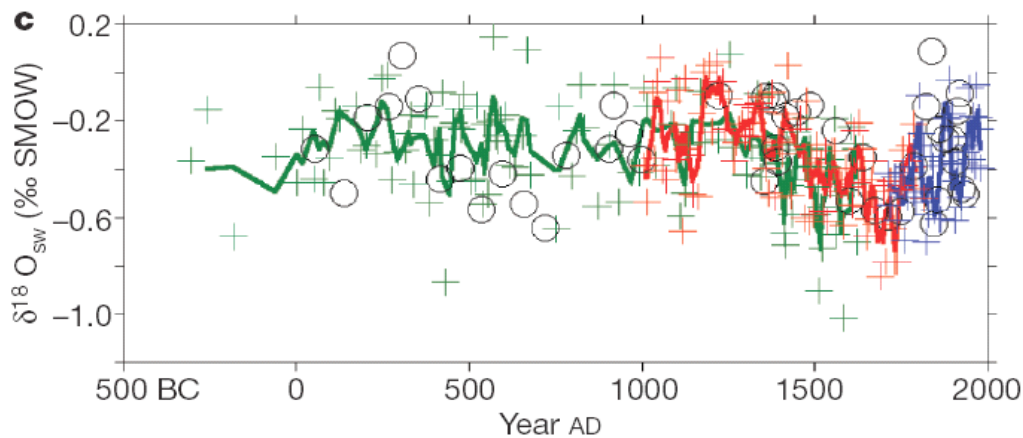
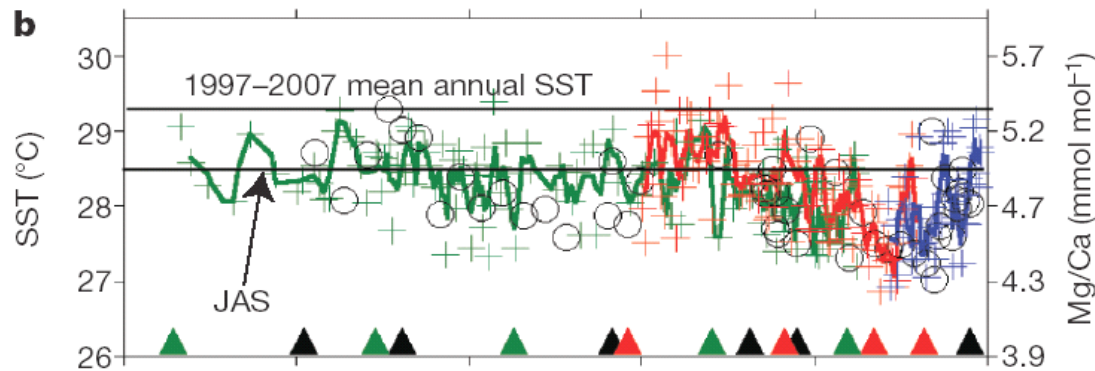
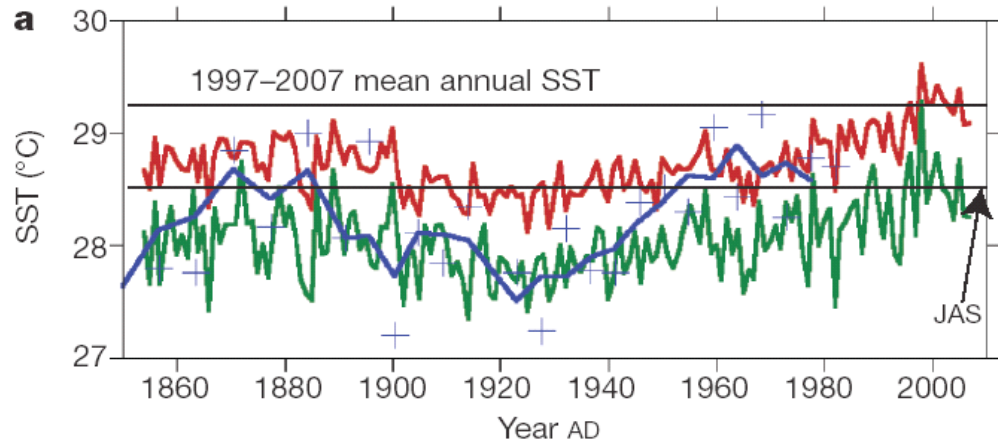
Fig. S9. Plots of the 19 (decadally smoothed) proxy records that pass the screening procedure back to at least A.D. 818, including four records from the Southern Hemisphere (labeled as SH) and 15 records from the Northern Hemisphere (labeled as NH). **Mann et al., PNAS, 2008**

Paleoclimate data from different research groups



Suffering from the same problems

From a recent article



Medieval Warm Period had as warm SST as the present.

Little Ice Age was cooler than the present.

The science of the global warming is not over.

→ **Just started.**

2,000-year-long temperature and hydrology reconstructions from the Indo-Pacific warm pool, D. W. Oppo et al., Nature, Vol 460 (27 August 2009) 1113-1116



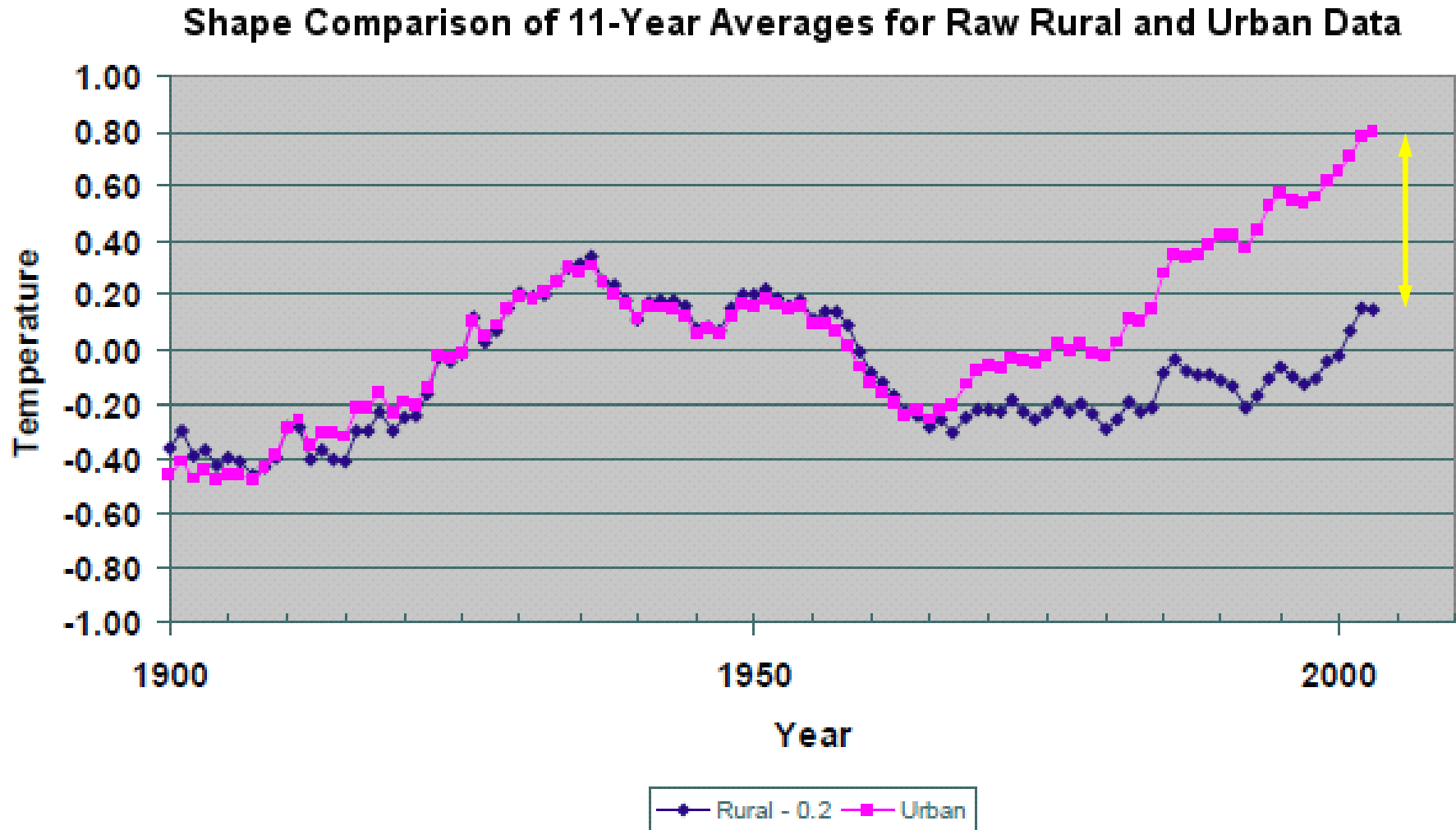
Surface temperature data suffer from the deterioration of monitoring sites. Investigation in progress, in USA (A. Watts) and in Japan (J. Kondo).

A rural site in Colorado, according to Roger Pielke Sr.

An example of a typical bad rural site, according to Anthony Watts



An example evaluating the heat island effect: in USA.



Edward R. Long, "Contiguous U. S. Temperature Trends Using NCDC Raw and Adjusted Data for One-Per-State Rural/Urban," SPPI (Science and Public Policy Institute) Original Paper, Thursday, 25 February 2010

Why did such **a narrow perspective** (flat past temperature and rapid rise in the 20th century) prevailed?

Self-strengthening by limited members with a narrow perspective: e.g. the paleo-climatology circle which refuses the MWP and the LIA.

The loss of diversity in the perspective leads to trapping at a local optimum from which the system cannot escape by itself (IPCC too).

Random selection of the members (e.g., IPCC authors) is important to keep diversity high (L. Hong & S. Page, PNAS 2004).

What is necessary for us?

Accurate information:

In particular, “Climate science is too young to apply to policy making.”

Wide point of view:

Single metrics (like CO₂) leads to “Rational idiot,” (A. Sen, “Choice, Welfare and Measurement,” 1982).

Example of policies:

Vulnerability / resilience approach.

Combination of CO₂ and aerosol (soot, in particular).

Global warming (Climate change)

Various factors

Causes

Anthropogenic factors

Greenhouse gases, Aerosols, Land use

Natural variations

Solar activity, Volcanoes, Atmosphere, Ocean

Climate sensitivity

Different influences

Influences

Global Regional Local

Policies

Global Regional Local

Averaged \leftarrow \rightarrow Individual

Suitable policies

Comprehensive Climate Treaty

Goal