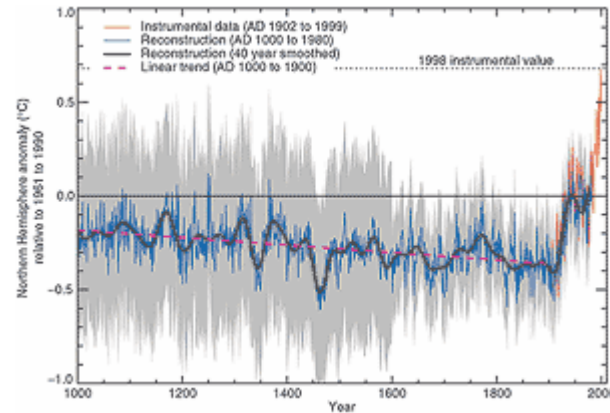


The Mann et al. Hockey Stick: A Tale of Due Diligence.

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Chapter Outline



- McIntyre and McKittrick collaboration since summer 2003
- Replication efforts and analysis up to Fall 2004

Chronology: 2003

- Tracking down data, documenting errors and discrepancies, attempting replication.
- M&M 2003:
 - *“Without endorsing the MBH98 methodology or choice of source data, we were able to apply the MBH98 methodology to a database with improved quality control and found that their own method, carefully applied to their own intended source data, yielded a Northern Hemisphere temperature index in which the late 20th century is unexceptional compared to the preceding centuries, displaying neither unusually high mean values nor variability. More generally, the extent of errors and defects in the MBH98 data means that the indexes computed from it are unreliable and cannot be used for comparisons between the current climate and that of past centuries”*

Chronology: Jan – June 2004

- Materials Complaint to *Nature*, led to Corrigendum (July 1 2004)
- Investigating newly-disclosed Fortran programs
 - Discovered influential difference between stated methods and actual methods
 - Data transformation over-emphasizes hockey stick shapes

Chronology: Jan – June 2004

- 2 implications:
 - Selects for hockey stick shapes
 - Specific targets: Bristlecone Pine proxies
 - Exaggerates their statistical significance
 - 37% instead of 8% explained variance

Chronology: July-Sept 2004

- *Nature* declines to publish our note
- Corrigendum inserted claim: “**None of these errors affect our previously published conclusions.**”
- We objected to this claim.
- *Nature* replied:
 - *Regarding your disagreement with the last sentence of the Corrigendum by Mann et al., I have consulted with my colleagues, who have now given the matter careful consideration. However, the errors Mann et al. refer to in the last sentence of their Corrigendum are **errors in the listing of the proxy data sets** in the original Supplementary Information, **rather than errors in either the data sets used or the computational procedures.** Errors in the listing of data sets obviously do not affect the calculations or results, and we therefore feel that the sentence is appropriate and justified.*

Chronology: Fall 2004 – May 2005

- “Hockey Sticks, Principal Components and Spurious Significance” *Geophysical Research Letters* Feb 15, 2005
- M&M Critique Update, *Energy&Environment* Feb 2005
 - News coverage: *Science*, *Nature*, *Economist*, *WSJ*, *National Post*, *NWT*, *BBC*, *Germany*, *Australia*, etc.
 - Mann maintains refusal to release computer code
- www.climateaudit.org

Chronology: June – Dec 2005

- 4 Comments submitted to GRL
 - 2 Rejected
 - GRL Editor replaced; new guy pulls rejected papers out of trash can
 - 1 rejected 2nd time
 - 1 still being reviewed

Chronology: June – Dec 2005

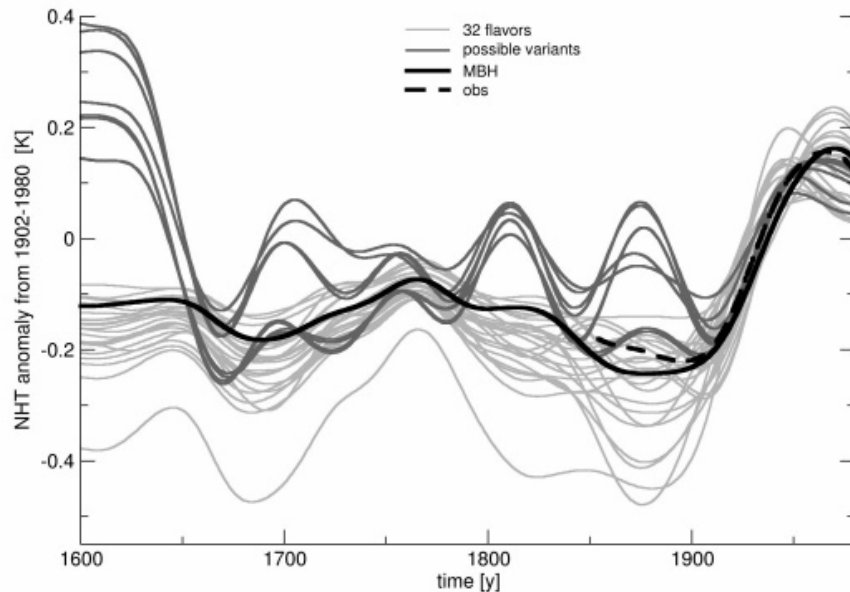
- Von Storch & Zorita
 - Concurs with “artificial hockey stick” effect
 - Presents case where it doesn’t “matter” but doesn’t address MBH directly
- Huybers
 - Concurs with AHS
 - Presents alternate PC method that partially limits effect
 - Concurs with insignificant R^2 result but disputes RE statistic

Chronology: June – Dec 2005

- **Barton Inquiry: June 2005**
 - Demands code from Mann
 - Elicits howls of protest from AGU, NAS, AAAS, etc.
- **Energy&NR Hearings: July 2005**
 - Houghton dismisses M&M based on a press release about Ammann&Wahl's paper
 - (which had been rejected a month earlier)
- **EPW Hearings: Sept 2005**
 - Michael Crichton draws on M&M work in criticizing lax standards on disclosure and replication in climate research

Chronology: Jan – March 2006

- Burger and Cubasch, *GRL*, cite M&M favourably



Chronology: Jan – March 2006

- House Science Committee requests National Academy of Sciences to Investigate Paleoclimate Reconstructions
- M&M to present



Lessons and Implications

- Scientific papers ought always to be reproducible and transparent
- When scientific papers are going to be used for policymaking it is especially important that they be independently audited
- If authors want to keep their data and methods to themselves, they should keep their results to themselves too.