

Unravelling Yet Another Climate Science Scandal

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By Ross McKittrick

Beginning in 2003 I worked with Stephen McIntyre to replicate a famous result in paleoclimatology known as the Hockey Stick graph. Developed by a US climatologist named Michael Mann, it was a statistical compilation of tree ring data supposedly proving that air temperatures had been stable for 900 years, then soared off the charts in the 20th century. Prior to the publication of the Hockey Stick, scientists had held that the medieval era was warmer than the present, making the scale of 20th century global warming seem relatively unimportant. The dramatic revision to this view occasioned by the Hockey Stick's publication made it the poster child of the global warming movement. It was featured prominently in a 2001 report of the UN Intergovernmental Panel on Climate Change (IPCC), as well as government websites and countless review reports.

Steve and I showed that the mathematics behind the Mann Hockey Stick were badly flawed and its shape was based on suspect bristlecone tree ring data. Controversies quickly piled up: two expert panels involving the US National Academy of Sciences were asked to investigate, Congress held a hearing, and media followed the story around the world.

The expert reports upheld all of our criticisms of the Mann Hockey Stick, both of the mathematics and of its reliance on flawed bristlecone pine data. One of the panels, however, argued that while the Mann Hockey Stick itself was flawed, a series of other studies published since 1998 had similar shapes, thus providing support for the view that the late 20th century is unusually warm. The IPCC also made this argument in its 2007 report. But the second expert panel, led by statistician Edward Wegman, pointed out that the other studies are not independent: they are written by the same small circle of authors, only the names are in different orders, and they reuse the same few data climate proxy series over and over.

Most of the proxy data does not show anything unusual about the 20th century. But two data series have reappeared over and over that do have a hockey stick shape. One was the flawed bristlecone data that the NAS panel said should not be used, so the studies using it can be set aside. The second was a tree ring curve from the Yamal Peninsula compiled by UK scientist Keith Briffa.

Briffa had published a paper in 1995 claiming that the Medieval period actually contained the coldest year of the millennium. But this claim depended on just 3 tree ring records (called cores) from the Polar Urals. Later, a colleague of his named FH Schweingruber produced a much larger sample from the Polar Urals, but it told a very different story: the medieval era was actually quite warm and the late 20th century was unexceptional. Briffa and Schweingruber never published those data, instead they dropped the Polar Urals altogether from their climate reconstruction papers.

In its place they used a new series that Briffa had calculated from tree ring data from the nearby Yamal peninsula which had a pronounced Hockey Stick shape: relatively flat for 900 years then sharply rising in the 20th century. This Yamal series was a composite of an undisclosed number of individual tree cores. In order to check the steps involved in producing the composite, it would be necessary to have the individual tree ring measurements themselves. But Briffa didn't release his raw data.

Over the next nine years, at least one paper per year appeared in prominent journals using Briffa's Yamal composite to support a hockey stick-like result. The IPCC relied on these studies to defend the Hockey Stick view, and since they had appointed Briffa himself to be the IPCC Lead Author for this topic there was no chance they would question the Yamal data.

Despite the fact that these papers appeared in top journals like *Nature* and *Science*, none of the journal reviewers or editors ever required Briffa to release his Yamal data. Steve McIntyre's repeated requests for them to uphold their own data disclosure rules were ignored.

Then in 2008 Briffa, Schweingruber and some colleagues published a paper using the Yamal series (again) in a journal called the *Philosophical Transactions of the Royal Society*, which has very strict data sharing rules. Steve sent in his customary request for the data, and this time an editor stepped up to the plate, ordering the authors to release their data. A short while ago the data appeared on the internet. Steve could finally begin to unpack the Yamal composite.

It turns out that many of the samples were taken from dead (subfossil) trees and they have no particular trend. The sharp uptrend in the late 20th century came from cores of 10 living trees alive as of 1990, and 5 after 1995. Based on scientific standards this is too small a sample on which to produce a publication-grade proxy composite. The 18th and 19th century portion of the sample, for instance, contains at least thirty trees per year. But that portion doesn't show a warming spike. The only segment that does is the late 20th century, where the sample size collapses. Once again a dramatic hockey stick shape turns out to depend on the least reliable portion of a dataset.

But an even more disquieting discovery soon came to light. Steve searched a paleoclimate data archive to see if there were other tree ring cores from at or near the Yamal site that could have been used to increase the sample size. He quickly found a large set of 34 up-to-date core samples, taken from living trees in Yamal by none other than Schweingruber himself! Had these been added to Briffa's small group the 20th century would simply be flat. It would appear completely unexceptional compared to the rest of the millennium.

Combining data from different samples would not have been an unusual step. Briffa added data from another Schweingruber site to a different composite, from the Taimyr Peninsula. The additional data were gathered more than 400 km away from the primary site. And in that case the primary site had three or four times as many cores to begin with as the Yamal site. Why did he not fill out the Yamal data with the readily-available data from his own coauthor? Why did Briffa seek out additional data for the already well-represented Taimyr site and not for the inadequate Yamal site?

Thus the key ingredient in most of the studies that have been invoked to support the Hockey Stick, namely the Briffa Yamal series, depends on the influence of a woefully thin subsample of trees and the exclusion of readily-available data for the same area. Whatever is going on here, it is not science.

I have been probing the arguments for global warming for well over a decade. In collaboration with a lot of excellent coauthors I have consistently found that when the layers get peeled back, what lies at the core is either flawed, misleading or simply non-existent. The surface temperature data is a contaminated mess with a significant warm bias, and as I have detailed elsewhere the IPCC fabricated evidence in its 2007 report to cover up the problem. Climate models are in gross disagreement with observations, and the discrepancy is growing with each passing year. The often-hyped claim that the modern climate has departed from natural variability depended on flawed statistical methods and low-quality data. The IPCC review process, of which I was a member last time, is nothing at all like what the public has been told: conflicts of interest are endemic, critical evidence is systematically ignored and there are no effective checks and balances against bias or distortion.

I get exasperated with fellow academics, and others who ought to know better, who pile on to the supposed global warming consensus without bothering to investigate any of the glaring scientific discrepancies and procedural flaws. Over the coming few years, as the costs of global warming policies mount and the evidence of a crisis continues to collapse, perhaps it will become socially permissible for

people to start thinking for themselves again. In the meantime I am grateful for those few independent thinkers, like Steve McIntyre, who continue to ask the right questions and insist on scientific standards of openness and transparency.