Evidence to the Independent Climate Change Email Review
By D R G Andrews

Introduction
I am aware that this is a late submission to the Review. It is late because it is prompted by the House of Commons Science and Technology Committee Report, released on 31 March 2010, and the evidence of the Climatic Research Unit to this Review posted on the Review website on 1 April 2010. In these circumstances I request that the Committee take this evidence into consideration.

Declaration of Interest
I am a UK taxpayer. I was a Member of Council and Honorary Treasurer of The Foundation for Science and Technology (1990-1999), appointed as one of the representatives for business and industry.

Comment
My comments refer only to Issue 4 as defined by the Climatic Research Unit (CRU) in their evidence. This concerns station selection, data testing, unification and coherence with other data sets.

The evidence provided by the CRU states that the agreement between its CRUTEM3 results and the results of other institutions, including the unadjusted GHCN data set, is "excellent". (paragraph 4.6).

It refers to the number of stations in CRUTEM3 (5121) and GHCN (7280) and to the selection of the base period of 1961-90 for calculating temperature anomalies.

The GHCN station count of 7280 refers to the total number of stations in the data set covering all periods. Analysis of GHCN reveals that the actual number of stations used in any year varies. In the baseline period of 1961-1990 there is data from ~6000 stations. After 1990 the number of stations in GHCN reduces to ~1200. This is a very significant reduction. This is not obvious from the CRU evidence. The station count in CRUTEM3 during the baseline period of 1961-1990 and post 1990 is not stated in the evidence. The presumption is that it was 5121. It would be helpful if the CRU clarified the position.

The difference revealed in the GHCN station count between the baseline period of 1961 -1990 and post 1990 is significant because it has the potential to bias the results of anomaly measurements.

My understanding of the scientific process is that it is unwise to alter instrumentation in the course of measuring heat or temperature. Global temperature measurements present obvious problems in this respect. Yet there is no evidence provided that the

effect of this difference in station count on anomaly readings between the baseline period and after 1990 has been assessed or measured.

In business it is normal practice to arrange for parallel runs of data when process changes are introduced in order to validate the changed process. There is no evidence that this has occurred with respect to CRUTEM3 global temperature data. In view of the overwhelming significance given to the temperature data, as a proxy for heat, in the global warming debate this omission is surprising. CRU should have validated the process change by making a parallel run of the 6000 station data set to compare with the results obtained with the 1200 station data set. Such validation would have increased confidence in the validity of post 1990 data. In the absence of such a parallel run the only alternative is to work with the data set that is available, namely GHCN Version 2.

An Alternative Anomaly Method

In its evidence to the House of Commons Committee the Institute of Physics commented "Public reconstructions may represent only part of the raw data available and may be sensitive to the choices made and statistical techniques used." The analysis of the unadjusted data supplied by the National Meteorological Services (NMSs) falls into this category.

The unadjusted GHCN data set is very large, comprising original temperature data supplied by the NMSs. An analysis of the unadjusted GHCN data is being undertaken by E M Smith, a retired computer consultant. He has managed a Cray supercomputer centre and is well qualified to devise software programmes to interrogate very large data sets. He has spent the best part of a year developing his analytical techniques and software programmes and applying them to the unadjusted GHCN data set. His programmes and results are posted on line as he completes them. To date he has analyzed most national data sets with the exception of sub-Sahara African countries. It thus remains work in progress.

A summary of his methods is set out here:
http://chiefio.wordpress.com/2010/03/29/europe-the-overview/
and at Attachment 1. Attachments 2 has charts for the UK and Germany respectively. He has posted numerous other charts and tables.

Important benefits of his analysis technique include identification of monthly as well as annual data, the numbers of thermometers used at each stage and the flagging of thermometer changes in the temperature series. His analyses of the NMS data sets reveal that temperatures have remained remarkably stable in many countries around the world. They also reveal that when instruments are deleted, or added and spliced onto the record, it can affect the recorded temperature trend. In this respect 1990 is revealed as a pivotal year. These results raise serious questions about the impact of these instrument changes and thus merit very close investigation.

Conclusions

1 Changes in CRUTEM3 station count over time are unclear and should be clarified.

2 Changes in the instruments over time will affect the results that are recorded; it does not accord with sound scientific practice.

3 No evidence is provided that the validity of the significant instrument changes made c1990 was tested by a parallel run of data.

4 In the absence of suitable parallel data, the GHCN Version 2 data set should be closely scrutinized and interrogated. The E M Smith tool set provides a documented method for achieving this and should be considered for this purpose.

5 The standard of proof required of climate science falls below that required of other areas of scientific research, eg the validation required for the approval of pharmaceutical compounds, even though the economic implications are far, far greater.

D R G Andrews
6 April 2010

Attachment 1

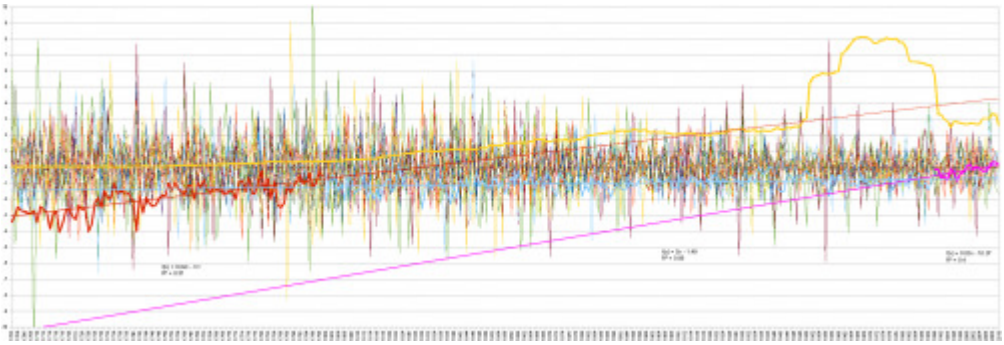
Europe – The Overview

March 29, 2010 by E.M.Smith

What Does Europe Look Like?

This is a gigantic chart. Please click on it to get a larger readable version. In it we see initial temperature rise in the 1700's as we go from one thermometer to 35 (though we start to hit a "modern profile" in about 1753 with 7 thermometers and are 'thoroughly modern' by 1780 with 27 thermometers).

The most striking thing to me (other than the sheer length of the record) is the astounding stability in Europe right up until the "hockey stick" forms with The Pivot in 1990. Nothing at all like a gradual onset of CO2 over the length of the industrial revolution. Exactly like a change of process. There is a very small upward drift to the middle, roughly in line with what one would expect from Urban Heat Island, growth of Airports in the record and all the other heatings of thermometers. About 1/2 C. Then that jump in 1990 with The Great Dying of Thermometers.



Europe All Data Monthly Anomalies and Running Total

This graph is All Data for Region 6 – Europe. The data are "unadorned". There is NO fill-in, homogenizing, interpolating, fabricating, estimating, or any other form of data "creation" (other than what NOAA / NCDC has put into the creation of the GHCN Version 2 data set of the January 2010 "vintage"). Furthermore, nothing is deleted. I use All Data.

This is an "anomaly" based graph. Each thermometer record is compared only with itself. The initial reading will be compared to itself, found equal, and yields a Zero value. From that point forward, each new value for each month will result in a "delta" or "anomaly" compared to the prior month. These "delta" values are stored in a data file. If there is data missing for a given thermometer record for a given year, a zero is entered into the data until a valid data item does show up for that month, then the difference is calculated and entered as the "anomaly" or "delta" in that year. (So 10C in 1900, nothing in 1901 and 1902, then 10.5 C in 1903 would be entered as 0.5 C of "anomaly" or warming in the 1903 record.) This lets me "span gaps" in the data without tossing data out and without fabricating 'fill-in" from nothing. It is the most reasonable choice, in my opinion. If you had 1 C / 100 years of warming, you would expect the 1900 to 2000 delta to be 1 C even if it were only in two records; one in 1900 and the next in 2000. So I see no reason to toss that information away due to missing data in the middle. (Remember, I'm

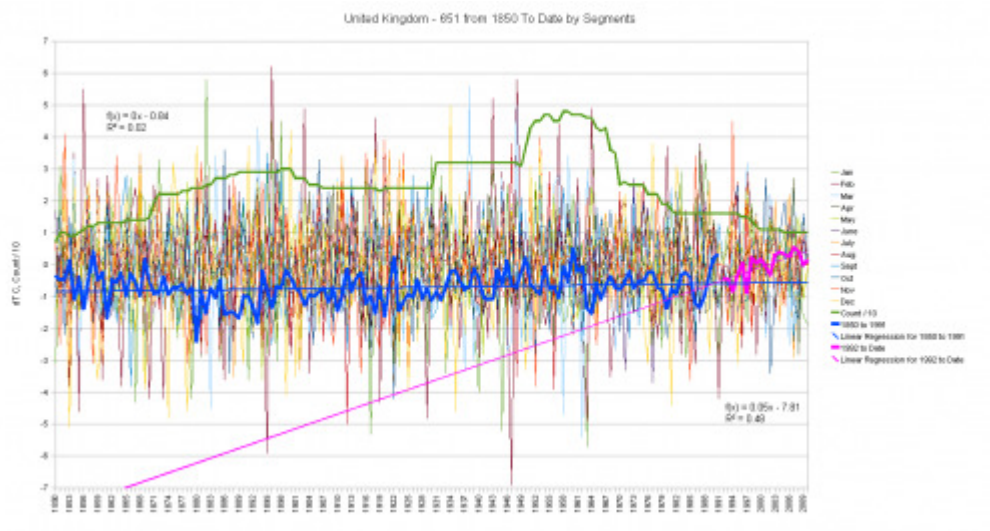
doing this for each individual thermometer record. Those two reading are from the same place and device…)

Those “anomalies” are then averaged for each year. The yearly average change is added up starting from the present and going “backward in time”. This makes the present “near zero” (actually just whatever the last change was from 2009 to January 2010) and accumulating changes backwards in time. We see “how was the past different from now?”.

You can see the average changes for any given month by looking at the monthly lines on the graph. This lets you see things like which months are most prone to large changes year to year. One of the striking features of the graph is just how much the “volatility” of those monthly values is suppressed recently. Either we are living in an age of unprecedented climate and temperature stability, or the data are being overly cleaned… That is, IMHO, one of the grand features of this graph. The ability to see what the monthly data ranges looks like. And to see if they look “clipped” recently (especially to the downside) along with seeing when they go to “near zero” and make that odd “squished” or “bullseye” look. That tends to happen when some major change was made and often indicates some kind of “splice” in the data. (Such as The Pivot in 1990 when most of the thermometer record gets a new “Duplicate Number” as something was changed in the processing.)

United Kingdom

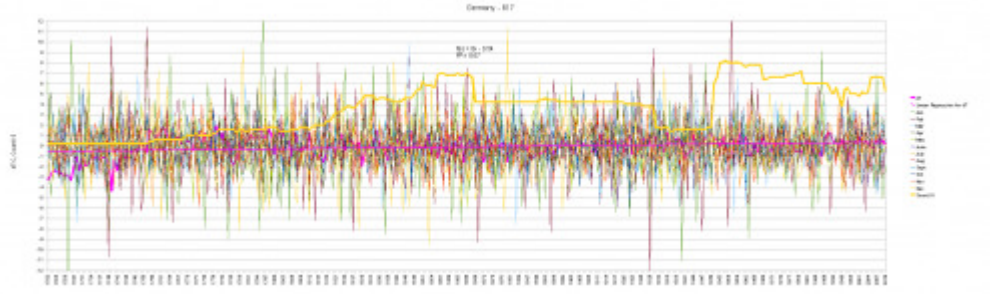
How odd. In the UK the “Dip” runs 10 years later than elsewhere. Right on top of the CRU baseline… 1961 to 1990. But it’s net a zero from time to time in the past… but what a fine Hockey Blade is spliced onto the end!



United Kingdom 1850 Monthly Anomalies and Running Total

Germany

We saw Germany in an earlier posting as the annual average dT/yr while this version has the full monthly data. While there is some wobble to the data, Germany has little net trend. The start has both lower lows and higher highs. Once enough thermometers are in place, the trend is just dead flat.



Germany Monthly Anomalies and Running Total