Comparisons of Temperature change of Poles versus Equator

I have heard from a number of sources about a faster rising of Average temperatures in the Polar regions than at the Equator. I want to confirm this by looking at the data. For example the 1st sentence of this article I came across the other day states "It is well known that the Arctic is warming up much faster than the rest of the globe."(see footnote 1). So I decided I would see if the data in the "CLIMATE TIME SERIES Browser" showed this faster warming in the Arctic.

At first I tried to randomly select 10 stations in the 0-10N Latitude bin
http://climatemodels.uchicago.edu/timeseries/#EhCnBzBSJMkXBXcZeKuQDlBhBpbIDvnCdEa
Then Selected the "Norm 1900-50" button, followed by the "Composite" button to then get the "List Composite" button and read the "Temperature Trend, °C / Decade" which gave me a "Data Composite" of "0.06"
Then 10 random stations from the 70-80N Latitude bin (I didn't use the 80-90N bin as there are only 3 stations).
http://climatemodels.uchicago.edu/timeseries/#CmvDECBZmCZcDCmDCfqBbeKBxmCFDBB
Followed the same procedure as above and got a "Data Composite" of "0.07"
Since the Temperature Trend, °C / Decade panel gave a "Time Range: 1850 - 2013, 1850 to 2010 gives us 17 Decades.
Therefore for 0-10N Latitude we have 0.06 * 17 = 1.02 °C temperature rise. And for 70-80N Latitude we have 0.07 * 17 = 1.19 °C temperature rise.

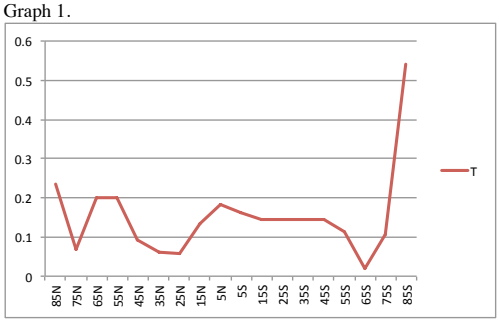
Ta Da!! Case proven. The Arctic is warming up much faster than the rest of the globe.

Only the above has a few problems. 1st, the data selection is no better than me throwing darts at a dart board with temperatures pinned to it. (NB I am a poor dart player at the best of times.) Also the result of 1.02 °C and 1.19 °C are both higher than the accepted 0.8 °C Global rise since 1880s. (see footnote 2). I realised that to improve the data selection I would need to select all the stations in the 2 bins. the 70-80N bin with only 44 stations I could manage, but the 0-10N bin having 289 stations I would be busy clicking to get all the stations. (I thought I would need to pick a new topic for my Term Project).

Then David Tweaked the "CLIMATE TIME SERIES Browser" and added a "Download All Stations" button.
So I stuck with my original idea and pushed forward with the additional idea of modelling the whole globe. It turns out that the "Download all stations" button didn't work as well as I had hoped for the information it provided in the "Temperature Trend, °C / Decade" panel. For example for 0-10N I would click the "Download 289 stations" button but only get 84 stations in the "Temperature Trend, °C / Decade" panel. Whereas when I went through and clicked on each station name I would get the full 289 stations. I proceeded bravely on downloading each of the stations for each Latitude bin and copying the information from the "Temperature Trend, °C / Decade" panel into a Excel spreadsheet. When I got to the 30-40N and the 40-50N bins with 1792 and 1904 stations in there bins, I wondered if I had bitten off more than I could chew, but I had got the bug now I was really interested in finding out if the data supported the idea of the Arctic warming faster.

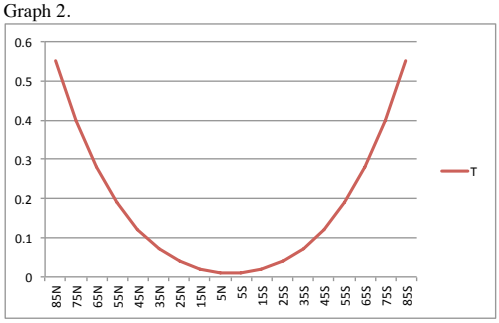
So after clicking on over 7000 climate station names, sorting them into there latitude bands and then getting the averages for each band to get a Temperature Trend, °C / Decade for each Latitude Band I then graphed the results and produced Graph 1.

Graph 1.



Earlier I had created a hypothetical graph of what it would look like if the planet was warming faster at the poles than the equator which looks like Graph 2.

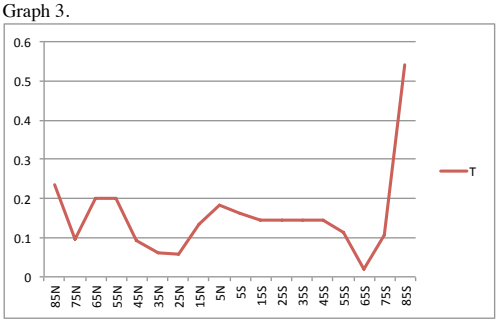
Graph 2.



Looking at Graph 1 and comparing it to Graph 2 I realised that Graph 1 did not support the poles warming faster theory.
I wondered if there were some stations with not many years of records which maybe distorting the data.

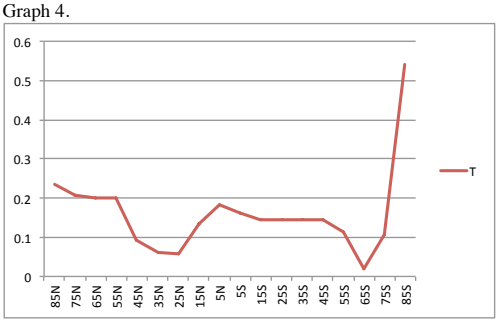
I noticed that the 70-80N Latitude band (represented on the graph as 75N) had a sharp down turn compared to the bands either side of it. So I had a look at the data and saw a station called "Myggbukta" with only 9 years of data but with a Temperature Trend, °C / Decade of -1.25. So I removed the Myggbukta data from the data pool which produced Graph 3.

Graph 3.



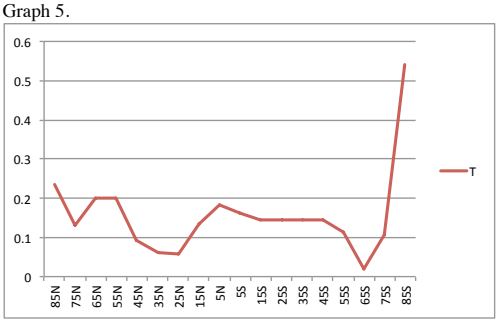
Comparing Graph 3 with Graph 1 I see that by removing just 1 data point the graph has moved towards the Hypothetical Graph 2, so I tried removing all the stations which had less than 20 years of data and had a negative Temperature Trend and produced Graph 4.

Graph 4.



Graph 4 is starting to look like it would support the Arctic warming faster theory, but suffers from a bad case of Cherry Picking the data.
So I then removed all stations with less than 20 years of data regardless of whether they had a positive or negative Temperature Trend and produced Graph 5.

Graph 5.

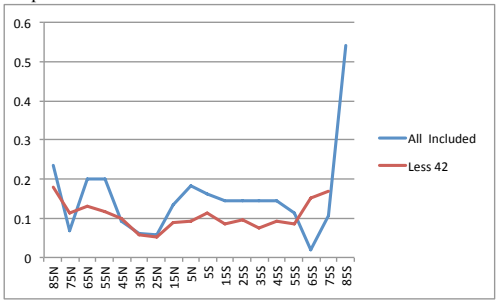


This Graph 5 is an improvement over Graph 1, and I wondered if I applied the same reasoning to all of the data, if it would improve the Graphs.
To be able to do this I needed to download all the data for each station and count how many years worth of data each station had. Again this was a mammoth task, but it was made easier as I had saved the URLs for each of the selections of stations. After I had added the Counts of how many years of data each station had into a spreadsheet that allowed me to remove stations from the data pool which is used to create the graphs, I then stepped through the data removing data 1 year at a time looking at the graphs that this produced. I created a animations of these graphs which can be seen as Graph 6. (Graph 6 is an animated gif which is included as an attachment)

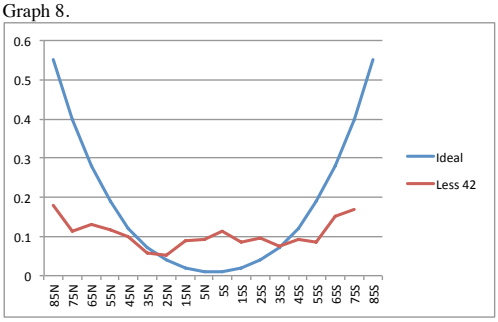
In this animation the blue line is Graph 1 with all the data and the red line is the Graph of the data adjusting as data is removed from the data pool.
I ran this animation from 0 to 54 years. Since the longest run of data is St.Louis/Lamb with 161 years of data Removing more than 1 third of the data is taking data cleaning too far.

Looking through the graphs that make up this animation I picked removing 42 years of data as a sort of close fit to the ideal graph 2. See Graph 7 & 8.

Graph 7.



Graph 8.



In conclusion I realise that removing 42 years of data to get a sort of close fit is way beyond cherry picking data, and is not valid at all. Also it has been many years since I have needed to use statistics to analyse such a graph to see if the difference between the data at the polar regions and the equator is statistically significant and as such it is beyond my abilities now.

So I guess this what science can be like sometimes, many hours gathering and analysing data to produce no result.

1 http://ourchangingclimate.wordpress.com/2013/11/15/cowtan-and-way-global-average-temperature-observations-compared-to-cmip5-models/
2 http://earthobservatory.nasa.gov/Features/WorldOfChange/decadaltemp.php