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 To: n.nicholls@BoM.Gov.Au
 Subject: Re: Climatic warming in Tasmania
 Date: Fri, 09 Aug 1996 20:04:00 +1100
 Cc: Ed Cook <drdendro@ldgo.columbia.edu>, NNU-NB@palais.natmus.min.dk, k.briffa@uea.ac.uk, Mike Barbetti <mikeb@emu.su.oz.au>, zetterberg@joyl.joensuu.fi, rjf@dar.csiro.au

Dear Neville,

You mentioned to me some time ago that in your view, the 11-year solar cycle did not influence temperature. There have been numerous attempts by academics to establish a correlation, but each has been shot down on some ground or other. I remember Barrie Pittock was especially dismissive of attempts to correlate solar cycle with temperature.

Have you tried this approach?

Load "Mathematica" into your PC and run the following set of instructions -

```
data = ReadList[ "c:\sydney.txt", Number]
dataElements = Length[data]
X = ListPlot[ data, PlotJoined-> True];
fourierTrans = Fourier[data];
ListPlot[Abs[fourierTrans], PlotJoined -> True];

fitfun1 = Fit[data,{1,x,x^2,x^3,Sin[11 2 Pi x/dataElements],
                Cos[11 2 Pi x/dataElements]},x];
fittable = Table[N[fitfun1], {x, dataElements}];
Y = ListPlot[fittable, PlotJoined -> True];
Show[X, Y]
```

The reference to "c:\sydney.txt" is a suggested pathname for the following set of data - which is Sydney's annual mean temperature.

```
16.8 16.5 16.8 17 17 16.7 17.1 17.4 17.9 17.4 17.2 17.1 16.9 17 17.2 17.2 17.4
17.6 17.6 17.6 16.7 17.1 16.8 17.4 16.8 17.3 17.8 17.5 17.1 17.2 17.6 17.3 17.1
16.9 16.9 17.3 17.3 17.3 17.6 17.5 17.4 17.2 17.1 17.3 17.2 17.2 16.9 17.5 17.4
17.2 17 17.5 17.4 17.5 17.7 18.3 17.8 17.4 17.2 17.4 18.3 17.3 18 18.1 18 17.5
17.3 18 17 18.2 17.4 17.6 17.5 17.4 17.1 17.4 17.3 17.5 17.7 18 17.8 18 17.4
17.8 16.8 17.5 17.4 17.6 17.6 17.2 17.4 17.9 17.9 17.6 17.7 17.8 17.7 17.6 17.8
18.3 18 17.6 17.8 17.8 17.8 18.1 17.9 17.5 17.8 18.3 18 17.7 17.3 17.5 18.5 17.4
17.8 17.7 17.8 17.7 18 18.5 18.2 17.8 18.1 17.5 17.8 17.8 18 18.6 18.1 18.1
18.6
```

So Far so good.

"Mathematica" first plots out the data itself (see Attachment 1)

The first part of the instruction set lets "mathematica" do a Fourier Transform on the data, ie. searching out the periodicities, if there are any. The result is shown on Attachment 2.

The transform result shows a sharp spike at the 11 year point (I wonder what is significant about 11 years?). The second part of the instructions now acts upon this observed spike (the Cos 11 bit), to extract it's waveform from the rest of the noise. The result is shown as a waveform in attachment 3, the waves having an 11-year period, with the long-term Sydney warming easily evident.

Attachment 4 shows the original Sydney data overlaid against the 11-year periodicity.

It would appear that the solar cycle does indeed affect temperature.

(I tried the same run on the CRU global temperature set. Even though CRU must be highly smoothed by the time all the averages are worked out, the 11-year pulse is still there, albeit about half the size of Sydneys).

Stay cool.

John Daly <http://www.vision.net.au/~daly>

Attachment Converted: c:\eudora\attach\Sydney.gif

Attachment Converted: c:\eudora\attach\Fourier.gif

Attachment Converted: c:\eudora\attach\Solar1.gif

Attachment Converted: c:\eudora\attach\Solar2.gif