Ignoring a Natural Event to Blame Humans

By ignoring a natural event scientists blame climate changes on human activity

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October 2007

Introduction

In the last week of September 2007 we had yet another example of a well-recognized natural climate event being ignored in order to sell the notion that mankind is responsible for global warming. Maybe it was deliberate or maybe just ignorance, but you'd think that capable scientists would look closely at prior research and the data and not just be activists for their latest cause.

This time it was Power and Smith, from Australia's CSIRO and Bureau of Meteorology respectively, who were reporting a weakened Walker Circulation over the last 30 years and a concurrent period of unprecedented El Niño dominance **[note 1]**, both of which they blamed on human activity.

Last year in May it was Vecchi *et al* **[2]** who told us that the same Walker Circulation had weakened by 3.5% since the mid-1800s and there that there was a just 1% probability that this was due to natural events. Vecchi and Soden **[3]** recently continued their line of argument from 2006 by claiming that an ensemble of 23 climate models confirms that weakening of the Walker Circulation is to be expected under anthropogenic warming.

These three papers seem to be the product of researchers lost in their computer simulations and putting the virtual reality of computer models ahead of observational reality.

What they attribute to human activity are natural events that have been well described by other researchers.

The Walker Circulation

The Walker Circulation, to which all three papers refer, is a large zonal circulation cell over the equatorial Pacific. Air in the extreme western Pacific rises from near sea level to around 15,000 feet, then travels eastward under the Earth's rotation to the eastern Pacific where it sinks back to sea level and westerly winds force it back across the ocean to the complete the loop.

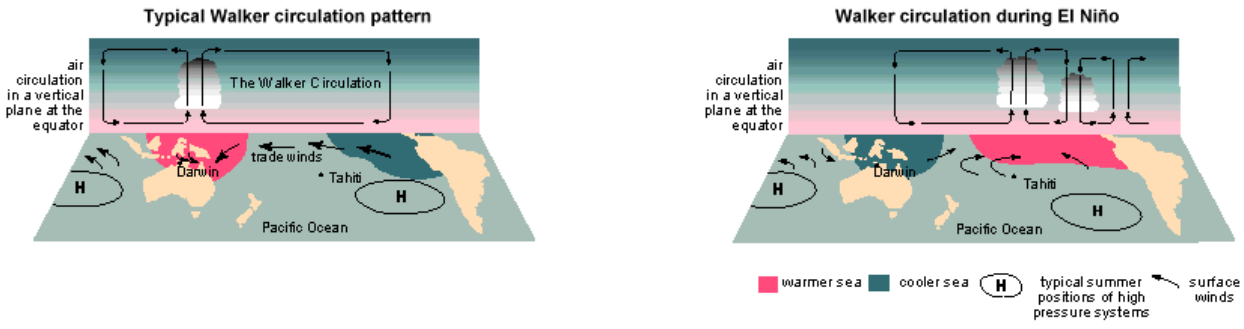

Figure 1 - Walker Circulation during normal conditions compared to that during El Nino conditions
(from http://www.bom.gov.au/lam/climate/levelthree/analclim/elnino.htm)

Figue 1 shows the Walker circulation under normal conditions, which intensify during La Nina conditions. Under El Nino conditions the Walker circulation weakens and fragments because most of the air rises in the central Pacific and much of it moves towards the mid latitudes (about 45N and 45S) via the Hadley Cell Circulation, which is similar to the Walker Circulation but at right angles to it.

These two distinct points of air rising are easily verified by examining the cloud cover data because wherever the air rises it is warm and moist so it easily creates clouds. According to data from the International Satellite Cloud Climatology Project (ISCCP), under La Nina conditions mid and high-level cloud increases in the western Pacific but under El Nino the amount of cloud decreases. In the central and eastern Pacific the opposite occurs, with mid and high level cloud decreasing under La Nina but increasing under El Niño.

It is clear from the above that the strength of the Walker Circulation depends very much on the Pacific Ocean conditions described by the Southern Oscillation. If the Southern Oscillation exceeds certain threshold values the conditions are described as La Nina or El Niño.

The three papers agree with this description of the Walker Circulation but they claim that it has weakened due to anthropogenic warming.

They claim that anthropogenic global warming drives the Southern Oscillation, but it is widely accepted that a very strong El Niño caused the 1998 temperature spike. Taken together these comments imply a double-feedback mechanism with warming causing El Nino events and El Niño events causing warming. If this was correct then surely at some point in the Earth's last 4 billion years such runaway conditions would have already occurred and rendered this planet uninhabitable.

The Great Pacific Climate Shift of 1976

All three papers blatantly ignore the Great Pacific Climate shift that occurred at or near the start of 1976. This is a widely recognized phenomenon among climatologists but apparently not these authors.

The reasons for the shift are not clear but the initial change appears to be abrupt, as will be shown shortly, but while this provides some clues about cause it says little about the ongoing effects.

Guilderson and Schrag **[3]** examined ocean water near the Galapagos Islands and discovered a sharp change in the amount of carbon-14 in the water. They concluded that a massive reduction in deep water upwelling had occurred. McPhaden and Zhang **[4]** supported this conclusion and estimated that the upwelling in the tropical Pacific decreased by about 25%, from 47 sverdrups in the1970s to 35 sverdrups in the 1990s (1 sverdrup = 264 million US gallons per second).

These changes in upwelling have been observed over time but the El Niño-Southern Oscillation (ENSO) is so poorly understood that we cannot be sure whether they are a cause or an effect, or perhaps were the initial cause and since then are a response to changes in other factors.

One thing is however certain. The upwelling cold water played a very significant part in cooling the waters of the eastern Pacific and without this cooling the temperature of the eastern Pacific Ocean has risen and moved the entire Pacific Ocean towards an El Niño state.

The ocean is slow to disperse the change in water temperature but not so the atmosphere and because the Southern Oscillation is part of the atmospheric conditions we see the climate shift reflected in its monitoring. Figure 2 shows the aggregated values of the Southern Oscillation Index

(SOI) as reported by NCAR. This shows a relatively neutral SOI until the early 1970s then a short period of mainly positive values prior to the sharp change to negative values in 1976.

The three-year aggregation across that period of change is shown in Figure 3. The flat period of this graph from December 1975 corresponds to a period of SOI values close to zero but after March 1976 the SOI moved into a predominantly negative state. A similar graph of the "Nino Index", based on the sea surface temperature in a defined region of the Pacific, shows a similar pattern but with a time-lag of two months, probably indicative of the slower rate of dispersal of heat in the ocean.

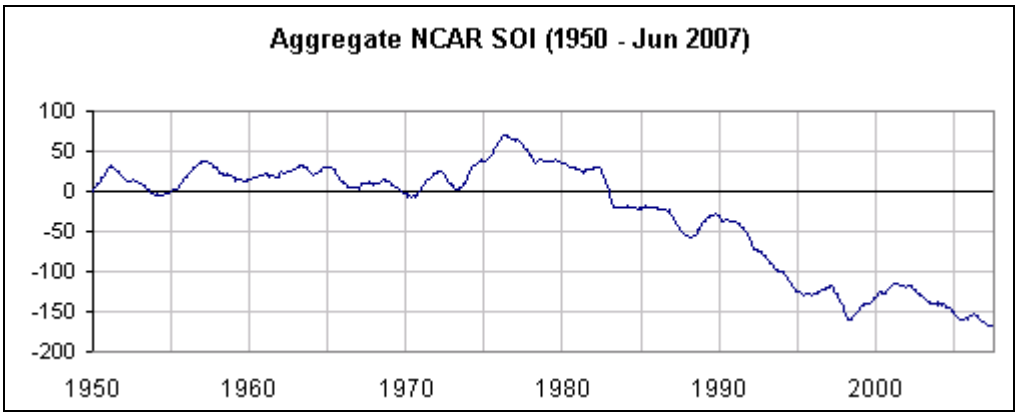

Figure 2 - Aggregate SOI values showing the abrupt change in 1976

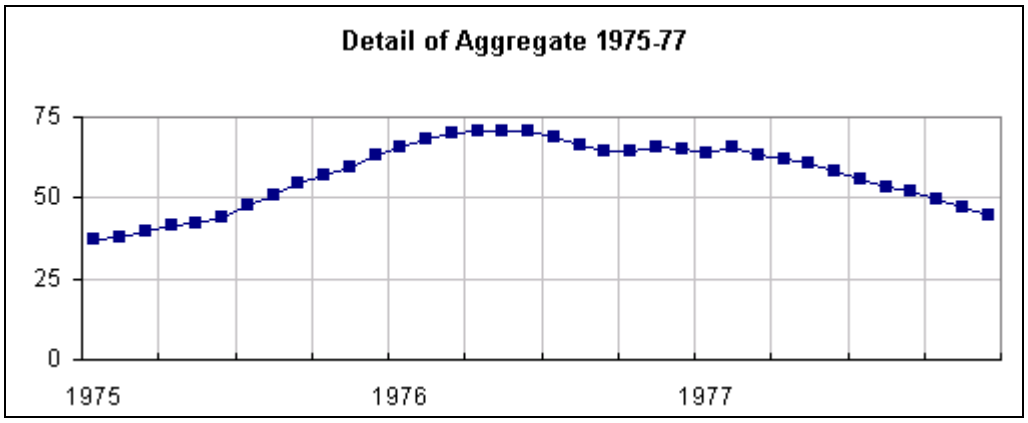

Figure 3 - Little difference exists from March to May 1976 but the aggregate peaks in May

The abruptness of this change in upwelling appears likely to be related to some cataclysmic event in the region. Scientists would surely have noticed any shift in winds that was strong enough to cause a semi-permanent 25% reduction in the upwelling of eastern Pacific cold water so the answer is probably hidden in the ocean itself. The only cataclysmic event in the general region at that time was the Guatemala earthquake of February 1976 in which 250,000 people were killed, but any link is purely speculative at the moment.

Figures 2 and 3 use the aggregated values of the SOI and that aggregation is used primarily because the index varies either side of a zero value. The aggregation can show us important turning points and we can calculate average values over a period of time from the total change in the graphed values between two dates. The actual values of the monthly or annual average SOI values look rather different but the shift in 1976 is very obvious.

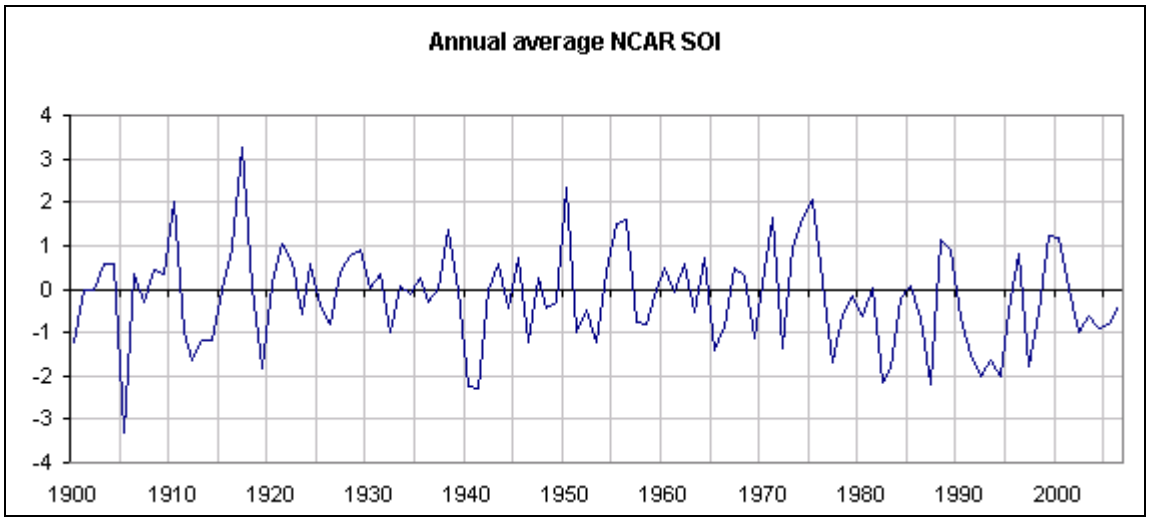

Figure 4 - Annual average SOI showing a clear shift in 1976.

According to the NCAR data the average SOI value for the 25 years from 1951 to 1975 was +0.116 but for the 25 years following 1976 (i.e. 1977 to 2001) the average was -0.612. This is a shift towards El Niño conditions, which is no surprise given the reduction in cooling water from the deep ocean.

Since 1976 the Pacific Ocean has been biased towards more El Niño like condition, and few La Nina events have been recorded. In the 367 months from January 1977 to July 2007 inclusive the NCAR SOI was negative in 233 months, positive in 129 and zero in the remaining five. Eight periods of 12 or more consecutive months of negative SOI values have been recorded, but only two similar periods with positive SOI values. More recently, for the period from January 2001 to July 2007 a negative monthly average SOI was recorded for 58 of the 79 months.

The trend in SOI values from 1867 to December 2006 is a decrease of 0.039/decade, but if the period is terminated at December 1975 the trend is a very small decrease of 0.012/decade.

The Southern Oscillation Index is calculated from sea-level air pressures at Tahiti and Darwin, Australia. Vecchi et al (2006) graphed the sea-level pressure across the Pacific but ignored the abrupt change in 1976 despite this clearly being the major cause of the claimed 3.5 % reduction in the Walker Circulation since 1860 (see Figure 5).

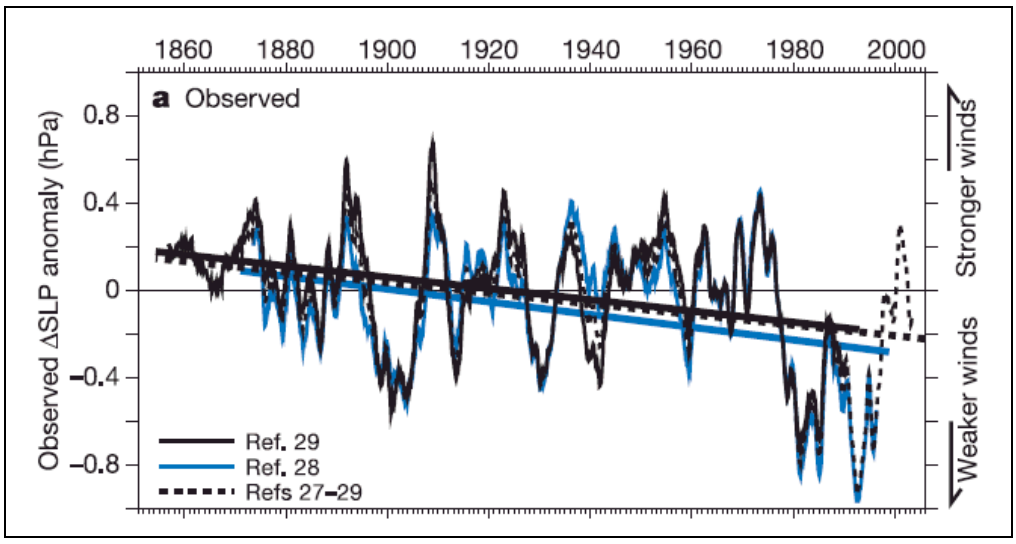

Figure 5 - Vecchi's figure 3a showing the 1976 climate shift that was ignored in the text

Similarly the Great Pacific Climate Shift can completely account for the finding of Powell and Smith (2007) of a predominance of El Niño conditions over the last 30 years.

In neither case it is necessary to invoke some human contribution to warming in order to explain the observations.

Somehow Vecchi and Soden (2007) have not only ignored the Climate Shift but they have added an anthropogenic component to 23 climate models in order that they produce output that agrees with the observations. That an extra input was necessary to account for natural events says volumes about the accuracy of these models.

At the same time the use of 23 models says volumes about the methods of researchers. Presumably all were different so at most just one model could ever be correct. If there was one accurate model among those 23 then the output of that model is lost among the 22 incorrect answers. It is more likely that no models were accurate in their processing and in their answers but Vecchi and Soden wish to imply that a consensus - or perhaps average - of incorrect models is somehow accurate and credible.

Numerous other authors (eg. **[6], [7], [8]** and **[9]**) appear conversant with the 1976 climate shift and its impact on various regions, so why not the authors of the papers in question?

Conclusion

It is shown here that there is good evidence the Great Pacific Climate Shift in 1976 changed the upwelling of cold water and moved the Pacific Ocean into a warmer state, which means towards El Niño conditions.

If we draw a trend line through the Southern Oscillation Index over a long term we find a trend towards El Niño conditions. It is a trend that's largely due to the 1976 shift because since then the Southern Oscillation has continued to fluctuate as it has always done, but now it does so about a lower mid-point. It is to be expected that in these circumstances the Walker Circulation will weaken and it would be a huge surprise if it was otherwise.

Natural events, and well-described events at that, can explain why the Walker Circulation has changed. The claim by Vecchi *et al* of a 99% probability that the change was due to humans can be soundly rejected. Power and Smith's (2007) claim that global warming has modified the Walker Circulation over the last 30 years is likewise refuted, although their claim of a shift towards El Niño is correct but it is wrongly attributed.

All three papers suggest that either the authors have an appalling lack of knowledge about one of the most important climate shifts in the twentieth century or that this event was deliberately ignored in order to falsely support the claim of man-made warming. There are no other options. I'd like to think it was the former, but there's plenty of reasons to consider it may have been the latter.

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