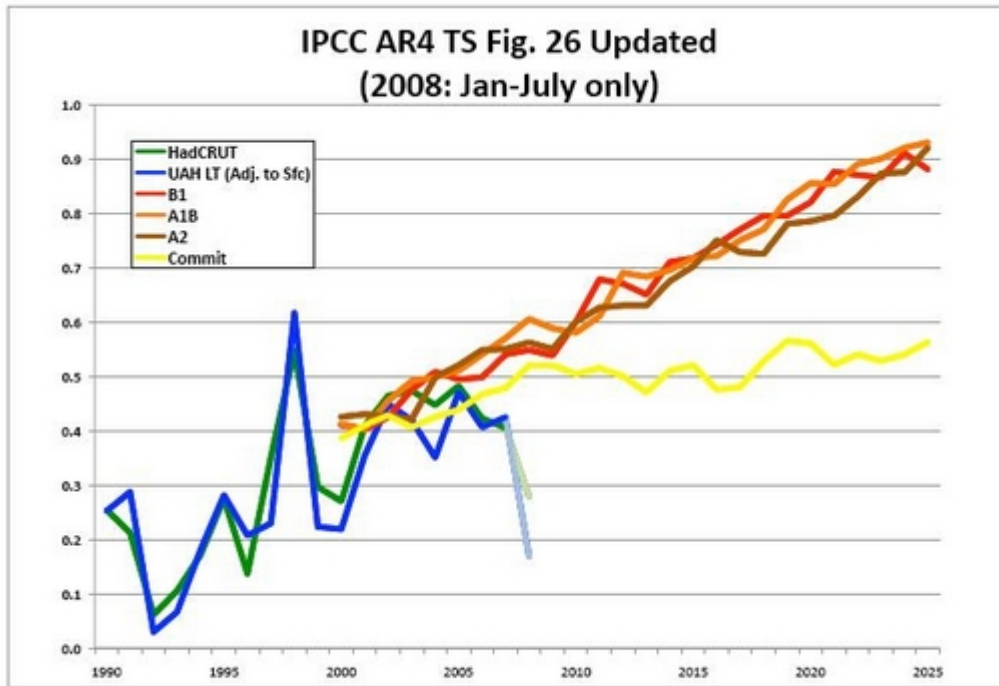


The Unifying Theory of Earth's Climate

By Stephen Wilde

Introduction:

The claims of those who worry about human damage to the climate become ever more strident despite, or perhaps because of, the real world data rapidly diverging from that which they anticipated.



(Figure 1) The failure of alarmist predictions

It is now ten years since the 1998 culmination of a period of thirty years of unusual ocean warmth that resulted in the atmospheric temperature peak of that year. Additionally during that period the sun was more active than ever previously recorded. (Figures 2 and 4)

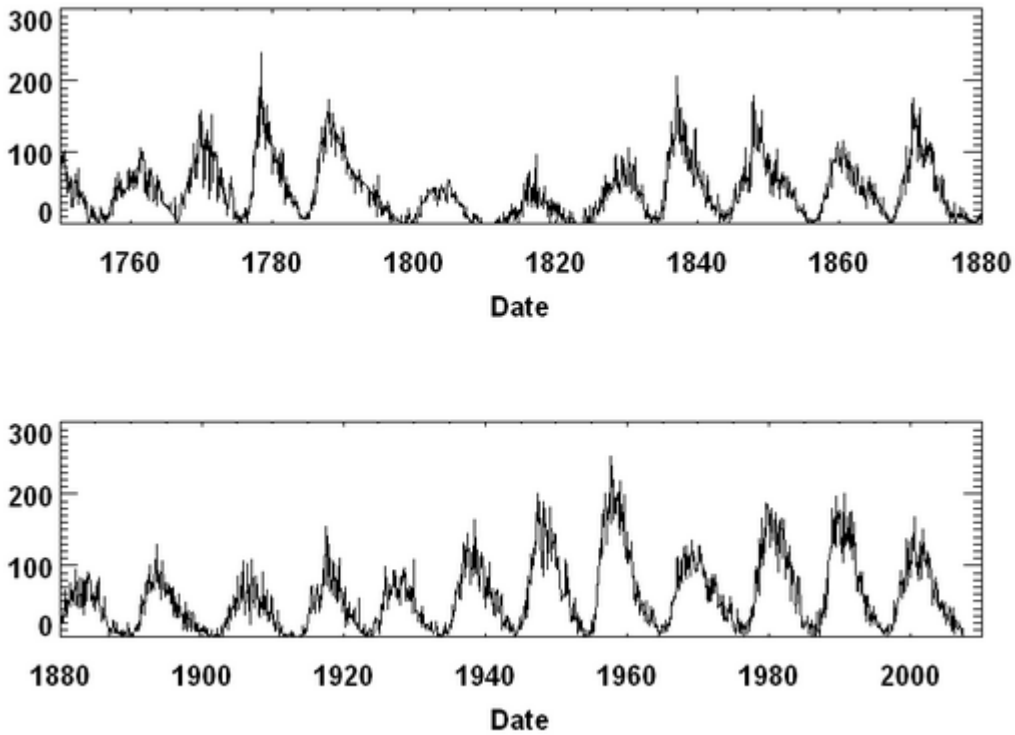


Figure 2 The high solar activity from 1940 to 2000

AGW proponents accept that the relative coolness of the past 10 years (Figure 3) is a result of cooler oceans but refuse to accept the corollary that the primary cause of the warmer period was warmer oceans. Warmer oceans also expand. (Figure 5) and release natural CO₂. The apparent levelling off in the sea level rise is coincident with recent cooler ocean surfaces.

Hadley CRUT3v and UAH MSU vs CO₂

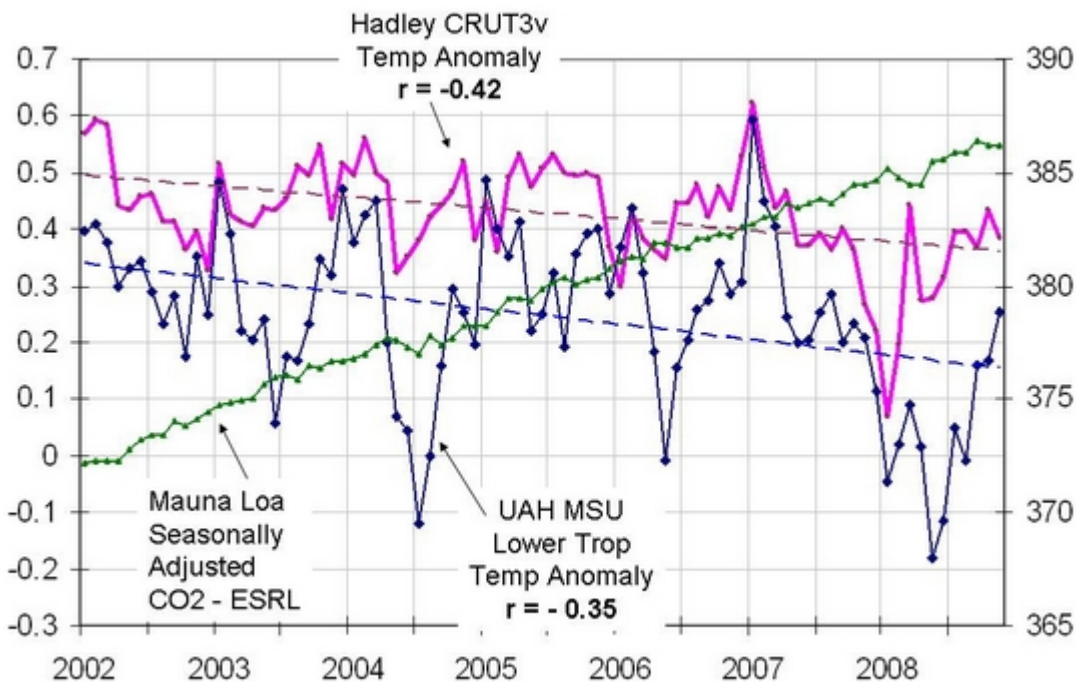


Figure 3- Falling Temperatures

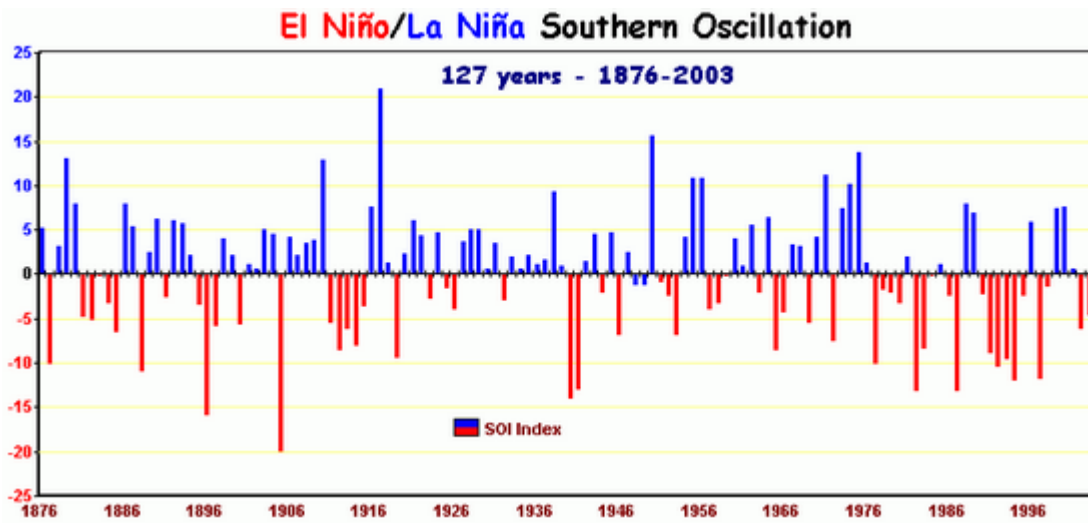


Figure 4- SOI index-warm El Nino is in red La Nina in blue

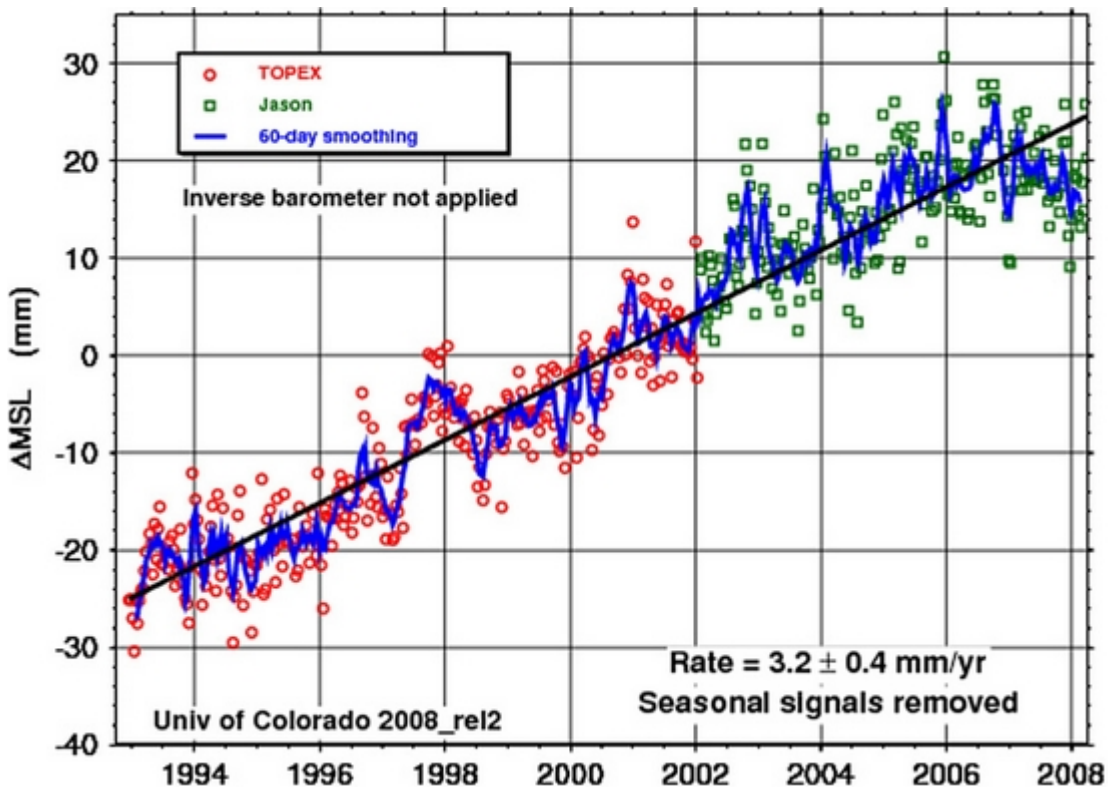


Figure 5- Sea Level Rise, has it peaked ?

It is a recent discovery that the oceans can act for decades at a time as net absorbers OR net emitters of previously accumulated solar energy on a vast and highly variable scale yet AGW proponents still ignore the overwhelming evidence because to acknowledge it would destroy years of fond memories of a publicly funded gold rush encouraged by their fanciful claims to understand climate and be in a position to influence it.

They ask us to believe many impossible things:

- a) That despite a historically very active sun there was no solar warming in the latter half of the 20th Century.
- b) That despite 30 years of anomalous ocean warmth the oceans were not the cause (but it is accepted that recent ocean cooling is the cause of recent atmospheric cooling).

- c) That the Arctic has only warmed because of AGW and not as a side effect of warmer oceans flowing into the Arctic Circle.
- d) That although warmer oceans release CO2 the observed increase in CO2 is all or mostly our fault.
- e) That a warmer surface increases the surface/space temperature differential yet does not give rise to a significant increase in loss of energy to space.
- f) That models which are abject failures in predicting changes in global temperature trend should be used to inform policy decisions up to 100 years hence.
- g) That the current cooling is weather but the earlier warming was climate.

I could go on but readers will get the picture.

After ten years the assertions that everything since 1998 is 'just weather', 'internal variability' or 'masking the underlying trend', become ever more tiresome and unreasonable to expect us to believe.

The latest diversion is to announce that recent cooler years are still in the top ten or top twenty warmest. Of course they will be until any new trend becomes longer established because all the warmest years will cluster around a peak both on the way up and on the way down. The same phenomenon would be observed at the bottom of a cooling trough.

How much longer do we have to wait to be given an honest admission that all is not well with the understanding of climate and an acknowledgement that by now there is legitimacy in calls for caution in the light of the potentially disastrous consequences of the 'solutions' that they have been proposing?

Solutions can be worse than problems but some seem oblivious to that. A fine and well informed judgement is required rather than emotional commitment to the cause.

For confirmation that current events are validating ideas which I presented earlier this year see here: <http://co2sceptics.com/news.php?id=1302>

and for confirmation that the scientific establishment is now coming into line see the excellent recent paper from Don Easterbrook here:

<http://wattsupwiththat.com/2008/12/29/don-easterbrooks-agu-paper-on-potential-global-cooling/#more-4714>

The AGW proponents must now pause, take stock and immediately advise the policy makers that the levels of confidence expressed in the IPCC reports are grossly overstated and now under serious question.

The attempts to dismiss all the accumulating real world evidence are perverse. Any suggestion that recent and current events represent merely a temporary cessation of CO2 induced warming must now stop. From the speed of recent climate responses to the quiet sun and negative oceans it must be apparent that the link is direct, rapid and potentially dangerous for global food production. On any view the human CO2 contribution must be powerless to drive anything on a time scale less than a thousand years. If there is a long term problem we have plenty of time to deal with it and will probably destroy ourselves by some other means well beforehand.

AGW proponents have for long enough been demonising so called 'deniers' over climate issues yet we are now on the cusp of a complete reversal whereby AGW proponents should now be proclaimed as the deniers of reality.

Cold is so much more dangerous than warmth that they are now likely to become responsible for far more damage to humanity than would have been possible through the actions of AGW sceptics.

By all means do our best to minimise real pollution, reduce the speed of depletion of natural resources and whatever else can be done reasonably and economically to protect the environment but do not waste time, money and a vast number of lives in the poorer nations by starting an energy rationing and redistribution programme on the basis of a potentially false premise concerning CO2

Energy rationing is an express route to resource wars, poverty and deprivation and thus even greater damage to the planet than might otherwise occur. It is a way of bringing forward that which we fear and denies us the opportunity to take time to get the solutions to the real problems right.

The Critical Omission:

If global warming alarmists wish to persuade us and lead us they first have to convince us and furthermore earn their status by openness, clarity and honesty.

Behind their contentions they should have a clear unified idea as to how the overall global climate actually operates in the real world from start to finish. It is transparent that they have no such idea.

The Earth is just a short term waystation receiving solar energy, processing it in various ways and then releasing it to space. There is currently no overarching conceptual picture of the entire process into which can be fitted all the myriad details which the 'experts' are arguing about.

Consequently there are no real climate experts. All we have is a wide variety of specialists in other fields that have a bearing on one aspect or another of climate related issues. The number of individuals who could be genuinely regarded as climate specialists is very limited and they are hampered by not being specialists in all the linked areas of science. Indeed the matter of climate is so all encompassing that it would be impossible anyway.

There are many sophisticated models that purport to mimic real world climate but to my mind they seem to be built upwards from innumerable details rather than downwards from a verifiable overarching concept.

No one knows how to attach due weight to each component so 'progress' is attempted by altering components very by guesswork and then seeing whether the models will produce results something like the real world. That is referred to as 'hindcasting' and it can be made to work but it is not possible to verify whether or not the hindcast represents truth unless the revised model can exhibit predictive skill.

In some limited respects models can be used to anticipate the future behaviour of individual components of the system for short periods. However the only thing that really matters as regards climate change is the ability to accurately predict changes in global temperature trend and to anticipate their speed and depth. It is not good enough to disingenuously assert, after a failure to predict a change in trend, that nevertheless they are right and it is just a temporary diversion to be expected from 'natural variability'.

Models have no policy making value unless they correctly anticipate the scale and timing of the effect from 'natural' climate drivers as against 'human' influences. Currently the models are incapable of being objectively verified as to the balance which they allocate between the two. When it was found that the models were failing to reflect reality all the difference was attributed to CO2 and the appropriate weighting inserted to remove the problem.

The immediate and continuing divergence from reality is proof that the weighting for CO2 was wrong.

Every prediction or projection made so far has immediately begun to diverge from reality and the expectations of ten years ago now lie in tatters.

Truly the blind are leading the blind.

The way Forward:

The most important issue is to resolve the 'chicken and egg' aspect so that the rest of the evidence can fall into a coherent scenario

The Thermohaline circulation in the oceans (quite distinct from ocean currents) is clearly set up by a combination of incoming solar energy plus temperature and density differentials in the entire body of the oceans which is then acted upon by the Earth's rotation.

According to the Hot Water Bottle Effect described by me at :

<http://co2sceptics.com/news.php?id=1487>

The oceans dictate short (or on a human scale medium to long) term changes in atmospheric temperature both up and down over periods involving a complete negative and positive cycle of 60 years or more and of course those cycles are themselves highly variable in intensity, location and timing. One 60 year cycle can take many years to work through all the oceans so we could be looking at near century scale effects for a single positive and negative cycle all overlaid on changes from solar dynamics.

Although attempts are being made to incorporate such cycles into the climate models the fact is that we do not have empirical data about the amount of heat energy being released or retained at any particular time nor any idea of the cause of the cycles, their timing, variability or scale or the way the cycles in different oceans interact.

In the background would be longer term solar effects such as the gradual increase in solar activity since 1600. Maybe small, slow and variable but accumulating a significant effect over 400 years since the depths of the Little Ice Age and now on a worrying downward trend.

Also in the background could be any long term change caused by human CO2 but for reasons expressed elsewhere I believe that to be too small to measure.

So, the oceans are the starting point and the main driver of changes in the short to medium term of the global atmospheric heat budget. There will always be oceanic multi decadal periods of net absorption or net emission of solar energy.

As soon as the ocean sea surface temperatures change enough to affect the global atmospheric energy budget then changes in the atmospheric pressure systems occur simultaneously as a direct result of the change in the energy budget. The atmospheric pressure systems are the energy budget in operation. The jet streams are moved polewards or equatorwards to restore equilibrium between energy entering the atmosphere from oceans and sun (or any other source) and energy leaving the atmosphere to space.

I only need to address the atmospheric energy budget in this article because the behaviour of the atmosphere constitutes climate in normal parlance. The energy budget of the oceans goes it's own way but the atmosphere follows depending on whether the oceans are in net absorption or net emission mode.

I believe that to be a plausible and coherent unified theory as to how the global thermostat operates in practice and as far as I can see it fits all known observations.

Summary:

My (novel) suggestion is that the first step in the process of atmospheric temperature change is the state of the global atmospheric energy budget arising primarily from combined solar and oceanic influences. Everything follows from that. The atmosphere is always either warming or cooling, never stable or at least not for long.

The conventional view has to date been that changes in the atmosphere can result in weather and climate changes which then drive the entire planetary energy budget (including the oceans according to AGW theory). That cannot be right but it is one of the reasons for concern about AGW because it implies that if we affect the atmosphere in any significant way then the climate will be affected.

The essential point that seems to have been missed by the entire climatological establishment is that in our planetary environment the net energy flow is one way only, from sun, to oceans, to atmosphere to space. The heating of land and air by the sun or downward reradiation from atmospheric GHGs is insignificant in relation to the sun/sea interaction.

Consequently there is no mechanism capable of reversing that one way flow except on a local and very short term basis. Yet AGW theory tries to tell us that a slightly warmer atmosphere can warm the oceans and disrupt the natural flow of energy despite the hugely greater density and energy storage capability of the oceans and the latent heat of evaporation that keeps a water surface cool when it encounters warmer air.

In so far as extra greenhouse gases are capable of warming the atmosphere slightly there are plenty of negative feedbacks capable of neutralising the warming effect and which I have described in some detail here:

<http://co2sceptics.com/news.php?id=1645>

For those who do not have the time to read that material I summarise the implications later in this article and have highlighted it in bold print and a larger font.

The Earth is well able to adjust it's built in thermostat to neutralise all but the largest categories of disruption (usually geological or astronomic) and humanity does not come anywhere near what would be required.

All the theories and schematics that I have seen describing the planetary energy budget assign a constant averaged value to energy movements between ocean and atmosphere but that is clearly now an outdated idea with the recent revelation that the oceans can be net absorbers or net emitters of energy for long periods of time. Those theories and schematics are no longer valid for global atmospheric temperature shifts that occur over periods of up to 100 years at a time. The temperature shift which we are all so concerned about (1975 to 2000) was spread over a period of only 25 years and so is well within the timescale of those natural climate drivers and in my opinion well within the variability predicated by the power of those natural drivers.

The fact is that we are not capable of changing the atmosphere sufficiently to override the overwhelming long term influence of the sun and shorter term oceanic shifts between warming and cooling modes.

The net energy budget of the atmosphere at a particular moment dictates the positions of the jet streams by setting the relative sizes and intensities of the high pressure systems on each side of the jet streams in each hemisphere.

As the atmospheric energy budget shifts for whatever reason (mainly sun and oceans in my opinion) the relative sizes and intensities of those high pressure systems change in tune with the energy budget changes and the jet streams move poleward or equatorward in response.

Inevitable weather changes follow and over time climate shifts occur and are observed. Movements of climate bands towards and away from poles or equator are well known phenomena and it was speculated during the recent warming that England would soon experience a more Mediterranean style climate. That prognosis is now in doubt.

Even if anthropogenic CO2 were a factor it would only be a tiny

factor such as to influence the average position of the jet streams a few miles either way and the temperature budget effect of that human influenced jet stream shift would itself neutralise the anthropogenic CO2 effect via the weather processes that I have described elsewhere.

The Earth has an oceanic and weather thermostat that can easily respond to any trivial changes that we could introduce. Only huge volcanic or astronomic influences have ever disrupted it and throughout geological time even those massive disruptions have failed to prevent restoration of conditions favourable to life.

The jet streams moved poleward in the 1970's at the beginning of warming. They have been moving equatorward since 2000 which caused a cessation of warming, followed now by cooling. Until they move back poleward there will be no more warming. At least my ideas explain observed changes in the global temperature trend. The CO2 records do not.

The Next Step:

In order to verify what I say it is necessary to be able to independently measure the state of the global atmospheric energy budget at any particular time.

At present that is beyond our capability but recent satellite sensors are a good start.

We can, however, do it by proxy.

If my contentions are correct then a calculation of the average position of both jet streams at a specific time should be linked to the state of the global atmospheric energy budget at that time.

If the jet streams are tracked for a while and then their average positions compared with observed global atmospheric temperature changes it should be possible to calculate the approximate jet stream position at which the globe shifts from atmospheric warming to cooling or back again.

Once that has been established then the distance the jet streams move poleward or equatorward from that point should reveal the speed of the ongoing warming or cooling process.

And of course a movement of the jet streams back towards the point of changeover will give early warning of a new change in trend.

It should be done and done now. There is too much at stake for proper scientific enquiry to continue to be suppressed.

Practical Implications:

In this section whenever I refer to the jet streams I mean the combined effect of the jet streams and the high pressure belts on either side of them.

- 1) Although I judge the solar/oceanic driver to be the primary cause of imbalances in the atmospheric energy budget that is not essential to the theory of what happens once the budget becomes unbalanced. Other factors including changing albedo, energising of the evaporation or convective processes, human CO2 and the natural swings in the power of the greenhouse effect caused by changing humidity will no doubt have an input. Others will no doubt work to resolve the relative scale of the various inputs.

- 2) When, occasionally and temporarily, the atmospheric energy budget is in balance the jet streams have little work to do other than try to maintain that balance. Once the energy balance in the atmosphere starts to change for whatever reason then the jet streams have to start working more vigorously. The important point to realise is that when the budget is in balance the efficiency of the jet streams is at a minimum.
- 3) The further away from the point of balance that the jet streams move either poleward or equatorward the more efficient their work becomes. In fact the efficiency increases disproportionately as they move poleward or equatorward because the more warm air is shifted poleward then the faster the atmosphere can get rid of any excess by radiation to space and the more air that is shifted equatorward then the faster any deficit can be replaced by sun and oceans. As the jet streams reach ever greater distances from the usual point of balance additional heat transfer efficiency also arises from increased mobility and a speeding up of all the weather processes due to increasing resistance from the less dominant high pressure cell which can never be eliminated completely.
- 4) As the excess or deficit is removed the jet streams move back towards their earlier position until there is another excess or deficit to deal with.
- 5) Consequently the system has long term stability but shorter term variability because the jet streams ramp up their efficiency to stabilise any unbalancing of the atmospheric energy budget and thereby neutralise the variations in input.
- 6) Any single input will only affect the position of the jet streams by a specific distance proportionate to the scale of it's influence before equilibrium is restored and the effect of that input is neutralised hence my above conclusion concerning anthropogenic CO₂.
- 7) The concept of an infinitely variable jet stream thermostat also serves to explain and to give a degree of predictability to the weather and climate changes that are observed as the atmosphere warms or cools. Each region's weather and climate will be affected by the shift in the favoured track of the jet streams.
- 8) Note that what matters to any particular region is not the actual change in global temperature because for all practical purposes it will be imperceptible. What really matters is the position of that region relative to the position of the jet stream and that will make a large difference to the weather and climate experienced even though the global change is tiny.

For example, residents of a region will experience a change in the direction of the prevailing winds so that if the winds switch from a prevailing equatorial direction to a prevailing polar direction or vice versa the observed temperature changes regionally will be substantial.

Such perceived changes in weather and climate are greatest over the northern hemisphere that has the majority of the land masses. In the southern hemisphere the oceans smooth out more of the regional changes.

There are serious implications for the major food producing areas on the northern continents.

- 9) That also helps to resolve the issue as to whether The Little Ice Age (LIA) or the Mediaeval Warm Period (MWP) were regional or global events. In my judgement they were global but the effects were more pronounced over the northern land masses. In each case they would have involved a shift in the jet streams in both hemispheres, Polewards for the MWP and equatorwards for the LIA.