

WHAT IS CONTROLLING GLOBAL, SOUTHERN HEMISPHERE, AUSTRALIAN & AUSTRALIAN SOUTHERN OCEAN TEMPERATURES?: WHAT TEMPERATURE CHANGES HAVE OCURRED FROM 1900 TO 2009?...AND, WHAT ARE THE GLOBAL & AUSTRALIAN TEMPERATURE FORECASTS FOR THE FUTURE PERIOD 2010 TO 2030?

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BRIEF INTRODUCTION: A few weeks previous to starting this research study (*IE. Friday 5th March 2010*), I had a detailed look at past & future forecast rainfall trends in the Murray Darling Basin area of Australia.....And, as it has been several years since my last web article on Global & Australian Temperature Trends, I have decided to do an up-to-date research paper & model forecast of Global & Australian Temperature Forecast Trends...As a companion article to the Rainfall Forecast article also found on our website articles page.

METHODOLOGY: I have compiled an updated Temperature Forecasting Model, Holton Temperature Forecasting Model (HTFM), by using the 4 most likely Temperature Influencing Climatic Variables:

I.E. SET A: FOUR TEMPERATURE INFLUENCING CLIMATE VARIABLES

- Carbon Dioxide PPM Variations
- Solar-Magnetic Variations (Using AA Magnetic changes)
- El Nino- La Nina Ocean Variations (Using the Southern Oscillation Index-SOI)
- Great Ocean Conveyor Belt Variations (Using the Atlantic Multi-Decadal Index-AMO)

These Climatic Variables were graphed alongside four, "4 Yearly Mean Temperature Series" from 1900 to 2007:

I.E. SET B: FOUR MEAN TEMPERATURE SERIES

- *Global Land & Ocean Temperatures Combined,
- *Southern Hemisphere Land & Ocean Temperatures Combined,
- *Australian Land Temperatures, &
- *Australian Area Adjacent Southern Ocean Sea Temperatures. (*All Temperature values sourced from <http://www.bom.gov.au/climate/change/>)

All 4 Temperature Influencing Climatic Variables (SET A) were then tested for correlation accuracy, against 4 "Four Yearly Mean Temperature Series" (SET B) for the time period from 1900 to 2007. The SET A: Four Temperature Influencing Climatic Variables were then placed in an equation which gave the closest line graph correlation to the SET B: "Four Yearly Mean Temperature Series".

The best correlating amounts of each of the SET A: Temperature Influencing Climatic Variables: IE. (1) Carbon Dioxide PPM Variations, (2) Solar-Magnetic Variations (Using AA Magnetic changes), (3) El Nino- La Nina Ocean Variations (Using the Southern Oscillation

Index-SOI), & (4) Great Ocean Conveyor Belt Variations (Using the Atlantic Multi-Decadal Index-AMO), that were used to calculate the final Holton Temperature Forecasting Model (HTFM), were:

(1) 4.5 times the **AA Solar-Magnetic Index, using a lagged Zero to 10 Year (11 Years Total) Running Yearly Mean. (View [Source](#))

Here, Solar-Magnetic Warming & Cooling effects have been found by myself and other researchers over the years, to show an up to 16year lag as the Solar-Magnetic effects to filter through the complex Ocean-Atmosphere-Land Climate System. An 11 year period was selected in this study as the lag period for this Holton Model, as this is the average Solar-Magnetic Cycle Length, as found & recognised generally by all from past history of the Sun's output.

(2) 4 times the Negative SOI Index using a 0-4 Year (5 Years total) Running Yearly Mean. (View [Source](#))

Here, the SOI Index is used in a negative capacity. As the well known El Nino (Negative SOI) causes warmer sea surface temperatures in the Pacific Ocean, and the equally well known La Nina (Positive SOI) causes cooler sea surface temperatures in the Pacific Ocean. Also, the El Nino-La Nina has been shown to affect sea surface temperatures for several years after it ceases in the tropical Pacific Ocean Area...This is because the El Nino-La Nina effects are then spread to adjacent Sub-Tropical Areas with time (View [Source](#)). A 5 year period was selected as the lag period to be used for the SOI in this Holton Model, as it fitted the approximate up to 5 year lag period expected by Tisdale & others.

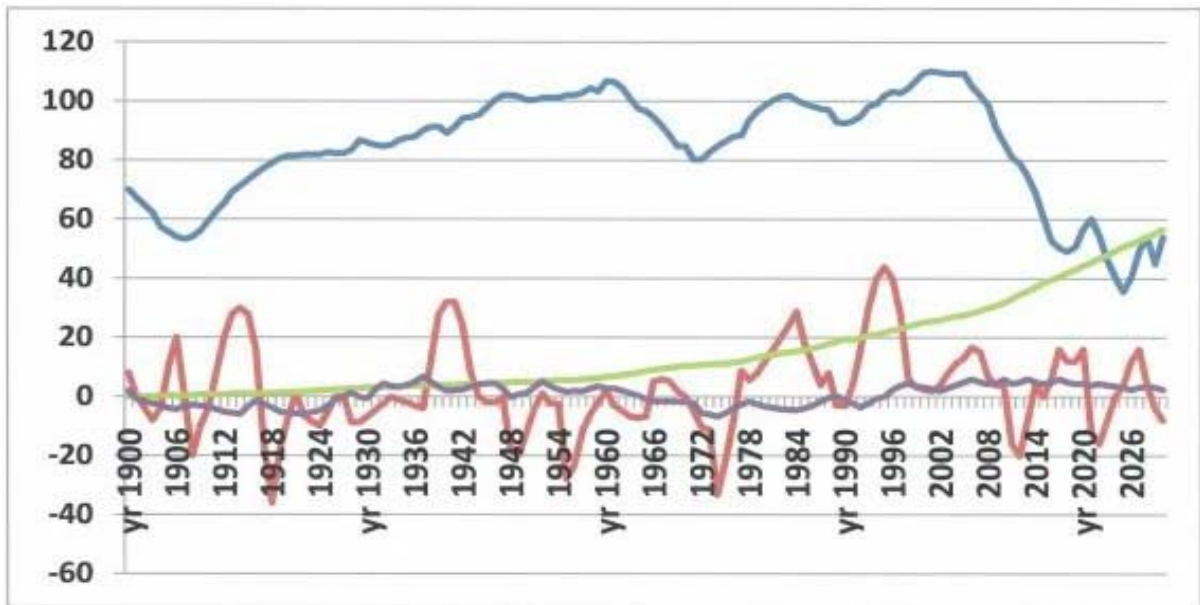
(3) 0.35 times the CO2 PPM Variation from the 1900 level using the Yearly Mean. (View [Source](#))

Here, the CO2 yearly increase over the past 100 years or so has been used by many scientists and many politicians & others to explain the small, but significant, Global, Australian and Regional Temperature rise over the past 100 years. The scientific expected effects from the CO2 increase are quite small, but are scientifically proven effects. However, the main "bone of contention" and "current raging world debate", is over whether this CO2 temperature increase is magnified by many positive feedbacks, which overwhelm any negative feedbacks. The scientific debate still rages on this last question! A Yearly Mean was selected here, as the CO2 increase is quite linear, and therefore it makes little sense to use any CO2 lag effect in this Holton Model.

(4) 0.2 times the AMO North Atlantic Ocean Index using the Yearly Mean. (View [Source](#))

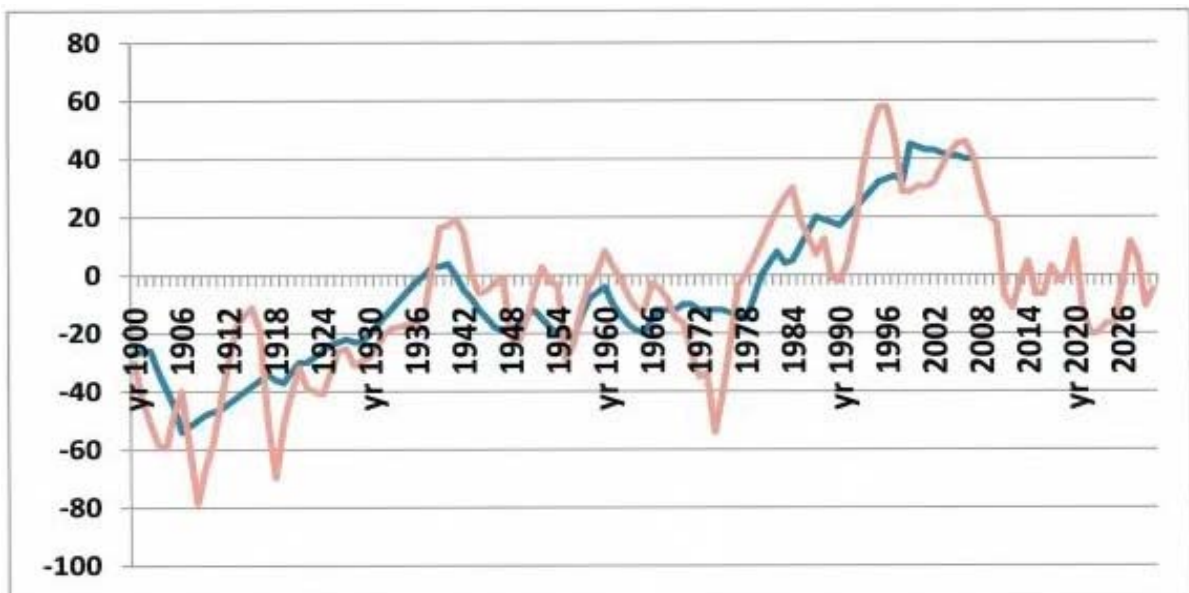
Here, the AMO Index measurement is at the commencement of the well known Great Ocean Conveyor Belt system, and it's Multi-Decadal Cycles have large effects on the North American, European, Northern hemisphere & on even some world weather systems. A 3 Year Mean Lagged Value was selected for this climatic variable, as there is also an expected lag effect in Temperature as it translates from Ocean to Atmosphere to Land.

The numerical quotas of the four Climatic Variables used in the Holton Temperature Forecasting Model (HTFM) are shown below in easily viewed graphical form on Graph 1 below. [The top Blue Line is the AA Index value, the Pink-Red Line is the SOI Index value, the Green Line is the CO2 Variation value, and the flatter Purple Line is the AMO Index value]:



MODEL RESULTS GRAPH 2: GLOBAL 4 YEARLY MEAN TEMPERATURE TRENDS

Graph 2: Holton Temperature Forecasting Model (HTFM) 1900 to 2030(Pink Trace) compared to 4 Year Running Mean Global Temperature Changes 1900 to 2007(Blue Trace):



MODEL RESULTS COMMENTARY & FORECASTS GRAPH 2: GLOBAL YEARLY MEAN TEMPERATURE TRENDS

1. The HTFM Model very closely & convincingly follows the main trends of the Global Mean Temperature Profile, IE. (a) A small temperature fall 1900 to 1906, (b) An extended temperature rise 1906 to 1940, (c) A steady or very slowly descending temperature period from 1940 to 1978, (d) Another extended fairly rapid rise in temperatures from 1978 to

1998, & (e) A final short steady or slightly descending temperature period from 1998 to 2007.

2. When we break down the different component parts of the HTFM Model into their various effects for each main global temperature trend periods we get the following very interesting results (Table 1: below)

INDEX-PERIOD	1900 - 1906 % Influence	1907 - 1940 % Influence	1941 - 1978 % Influence	1979 - 1998 % Influence	1999 - 2007 % Influence	Mean % Influence of the 5 Trend Periods: 1900 - 2007	TOTAL 1907 - 2007 % Influence
AA SOLAR-MAGNETIC INDEX	-69%	+50%	-33%	+33%	-37%	44.44%	+49% = 0.47C RISE
SOI NINO INDEX	-14%	+43%	-100%	+44%	-61%	52.4%	+18% = 0.17C RISE
CO2 PPM VARIATION	0%	+4%	+47% <i>Incorrect Tendency</i>	+13%	+9% <i>Incorrect Tendency</i>	-8% <i>Incorrect Tendency</i>	+27% = 0.26C RISE
AMO INDEX	-16%	+3%	-13%	+9%	-3%	8.8%	+6% = 0.06C RISE
TOTAL TEMPERATURE CHANGE	0.25C FALL	0.6C RISE	0.2C FALL	0.6C RISE	0.05C FALL	N/APP	0.95C TOTAL RISE

The interesting break-down of the Table 1 results into the 5 Main Temperature Trend Periods, shows that; (a) The AA Solar magnetic has a consistently strong correlation in the right direction for each of the 5 main temperature trends, (b) The SOI, apart from the first 1900 to 1906 period also has a consistently strong correlation in the right direction for all trends, (c) The AMO has a consistently weak correlation in the right direction for each of the 5 main trends, HOWEVER, (d) The CO2 PPM variation has an INCORRECT correlation for 2 of the main temperature trend periods IE. An *opposite correlation to that expected*, and a weak to very weak correlation for the other 3 main temperature trend periods.

These results clearly show that AA Solar-Magnetic and the related Ocean *El Nino-La Nina SOI changes, and to a lesser extent the related *AMO Ocean changes (*As Solar-magnetic changes heat the atmosphere & ocean as well, and this ocean heating then translates with lag time to further atmospheric heating)are running ALL short to medium range Global Mean Temperature Changes, *and that CO2 changes have no effect, or little effect at all...Apart from slightly suppressing temperature falls, and slightly adding to temperature rises.*

If we then look at the longer term extended oscillating global temperature rise from 1907 to 2007, the break-down effects of the effects of the 4 climatic variables changes somewhat, *as CO2 does show better correlation over this longer term temperature change period.....* HOWEVER, AA Solar-Magnetic increase changes are again THE MOST

IMPORTANT over this 101 year period, explaining 49% of the Mean Global Temperature increase, the SOI Nino explains 18% of the increase, and the AMO Index 6% of the increase. This makes a Total Solar-Ocean Contribution for the heating of 73%...While CO2 variations explain the other 27% of the global temperature increase from 1907 to 2007.

Now, most of the CO2 increase in PPM has occurred after approximately 1957. And in this 50 year period the CO2 variation was responsible for approximately 0.25C of the temperature rise during this period from 1957 to 2007.

If we keep the CO2 increasing at the 1957 to 2007 rate from now (2010) onwards the effect on global temperatures by the year 2100 would be around another 0.5C only. Noting that the current 1907 to 2007(101 year) TOTAL rise is 0.95C, of which only 0.26C appears, from this investigation, as being attributable to the "CO2 warming effect" .

Therefore, if in a theoretical case, we rely on the "AA Solar-Magnetic, El Nino SOI & AMO heating total effects", oscillating up and down with short and medium term, but somehow cancelling each other out, so they combined have a zero heating effect in the year 2107...Then the actual forecast "CO2 global warming effect" will be only around 0.75C TOTAL global temperature warming for the 150 year period from 1957 to 2107.

This figure matches fairly well with other theoretical CO2 PPM variation forecasts of the "CO2 global warming effect" causing global temperature increases of <1C for the doubling of CO2 PPM, EG, As quoted below:

"The greenhouse effect is real, as is the enhancement due to increasing carbon dioxide concentration.

However, the likely extent of global temperature rise from a doubling of carbon dioxide is less than 1C.

William Kininmonth, a former head of the National Climate Centre and a consultant to the World Meteorological Organisation, is author of Climate Change: A Natural Hazard (Multi-Science Publishing Co, 2004)."

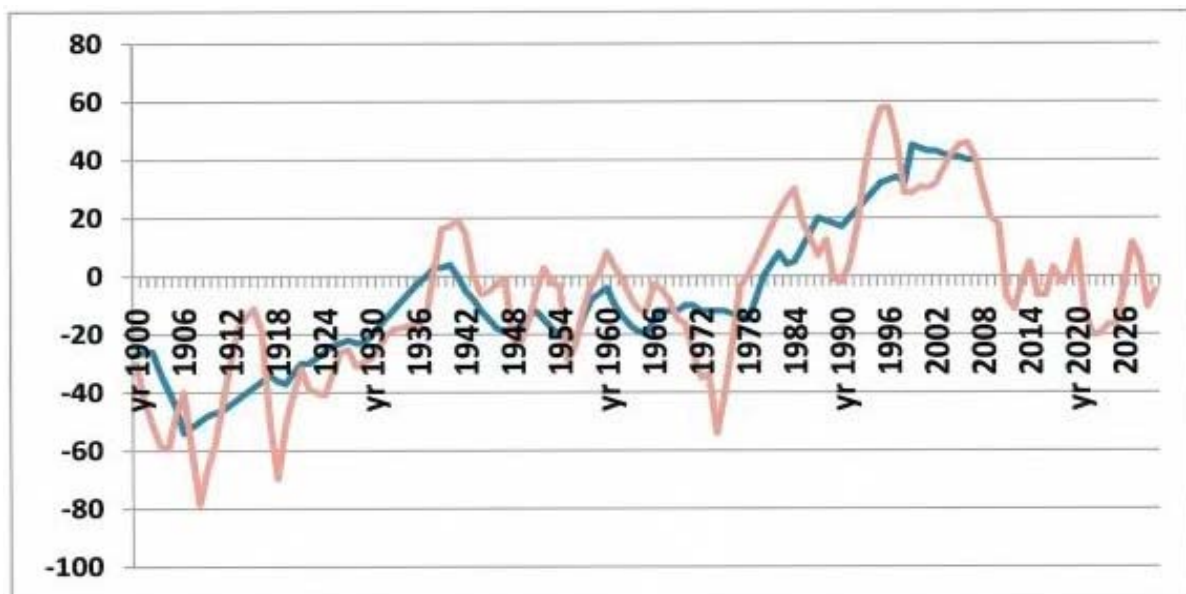
<http://www.theaustralian.com.au/news/opinion/cold-facts-dispel-theories-on-warming/story-e6frg6zo-1225704690711> the first

Remember also, that this above result from the "CO2 warming effect", does not take into account any other expected cooling or warming associated with the other 3 significant Climatic variables, of AA Solar-Magnetic, Pacific Ocean El Nino-La Nina SOI & Atlantic Ocean AMO changes. These may & likely will increase or decrease markedly, changing any resultant temperature effects from the "CO2 warming results" quite significantly in any year or time period in the future.

FORECASTING FUTURE GLOBAL TEMPERATURES FROM THE HOLTON HFTM MODEL FROM 2010 TO 2030:

We can make a forecast of likely reasonable accuracy using the Holton HFTM Model as a basis. Because, (1) The AA Solar-Magnetic Index has in the past few years changed from a high output AA-Sunspot Cycle, to a low output AA-Sunspot Cycle, and is expected to remain at this low output for at least the next few solar cycles up to 2030, (2) The CO2 PPM levels are unlikely to change from their current upward linear trend, and, (3) The AMO Index is in a warm cycle and is likely to stay in that approximate cycle up to near 2030.

The Nino SOI Index is a little harder to predict, however I have input it into the HFTM Model on the basis of the normal approximate 3 to 7 year cyclic patterns of El Nino-La Nina, IE. El Niño-Southern Oscillation (ENSO) describes the cycle of El Niño, neutral and La Niña patterns in the Pacific Ocean, which occur on time scales of typically 3-7 years (View [Source](#))



Looking at Graph 2 again (*Repeated above for convenience*), the resultant Global Temperature Forecast from the HFTM Model can be seen by the Pink Line.

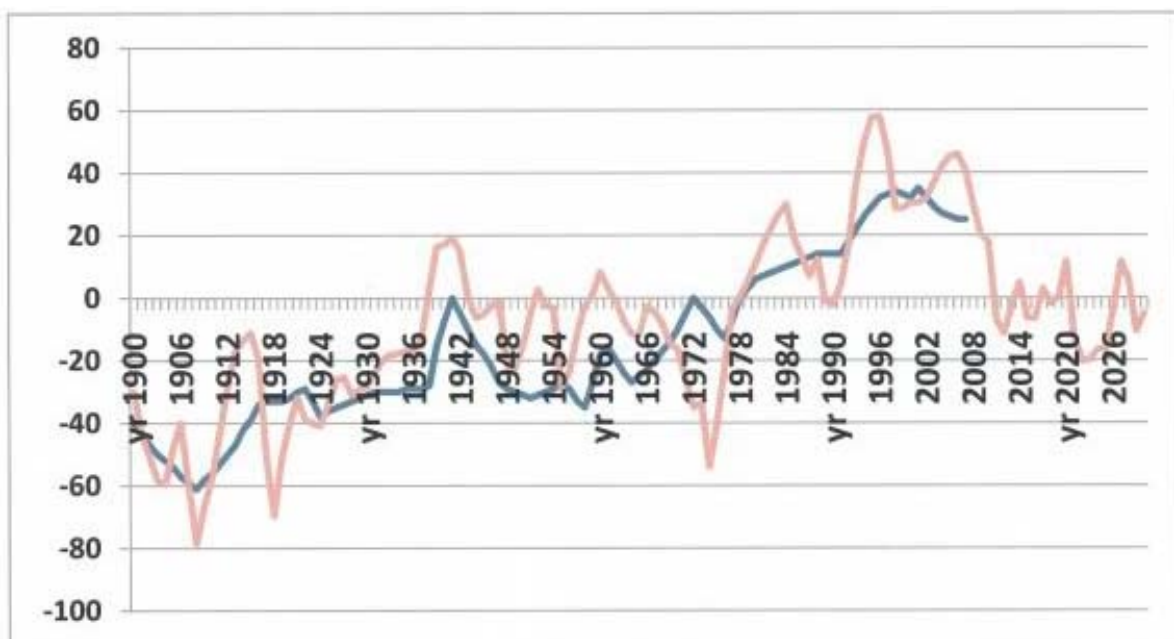
The HFTM FORECAST is expecting the AA Solar-Magnetic 15 Year Lag effect to start to kick in during the next few years.

Please note, that the actual pink HFTM trace results should not be taken too literally, *but more as a general temperature trend line*. For generally, the actual "4 Year Mean Actual Global Temperature" follows the *general mean of the HFTM Forecast*, NOT all of the smaller peaks and troughs. However, having said that, later in 2010 we should see the start of the forecast downturn in global temperatures, especially as the current strong El Nino is expected to change to a following strong La Nina by most global computer model forecasts before the end of this year 2010.

Mean Global Temperatures from then on, say from 2010-2011 onwards, until at least 2030, are from the HFTM Forecast expected to stay at levels similar to those experienced in the 1945 to 1978 period, IE. about 0.4 to 0.5C less than the current global temperature levels of around **0.6C above the 1900 to 2000 Mean Values. This drops the Mean Global Temperatures down close to the 1900 to 2000 Mean value from around late 2010-2011 onwards to 2030 at least. (**See [Source](#))

MODEL RESULTS GRAPH 3: SOUTHERN HEMISPHERE 4 YEARLY MEAN TEMPERATURE TRENDS

Graph 3: Holton Temperature Forecasting Model (HTFM) 1900 to 2030(Pink Trace) compared to 4 Year Running Mean Southern Hemisphere Temperature Changes 1900 to 2007(Blue Trace):

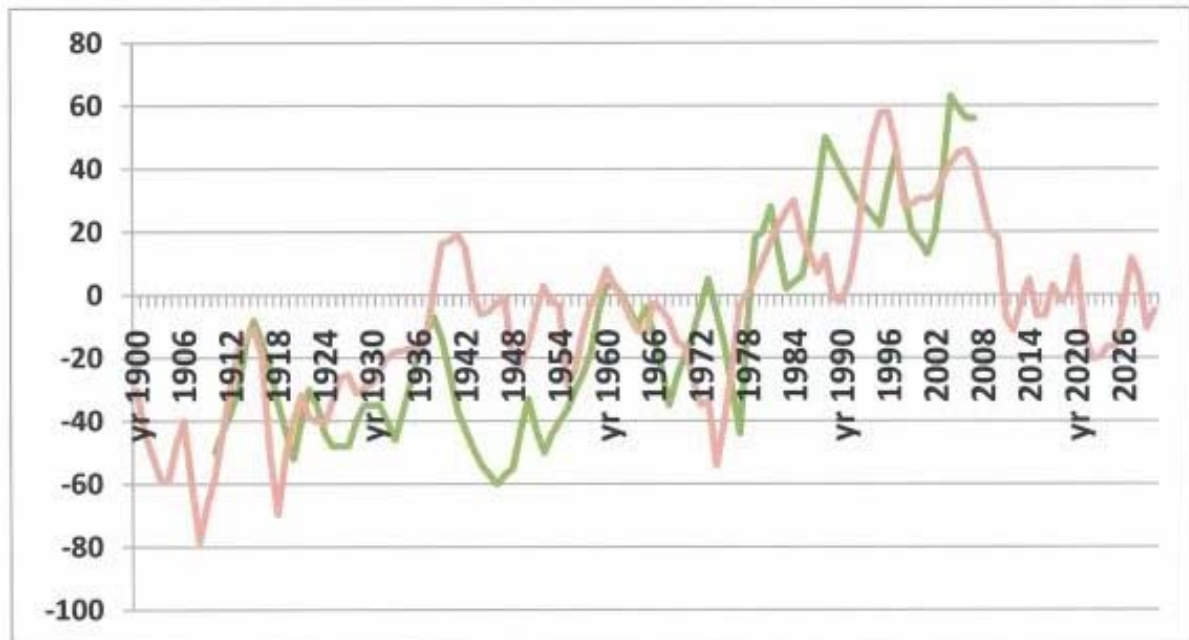


MODEL RESULTS COMMENTARY & FORECASTS GRAPH 3: SOUTHERN HEMISPHERE 4 YEARLY MEAN TEMPERATURE TRENDS

These results are very similar to those found from Graph 2, IE. The Global Mean Temperature Trend Series Results.

MODEL RESULTS GRAPH 4: AUSTRALIAN 4 YEARLY MEAN TEMPERATURE TRENDS

Graph 4: Holton Temperature Forecasting Model (HTFM) 1900 to 2030(Pink Trace) compared to 4 Year Running Yearly Mean Australian Temperature Changes 1900 to 2007(Green Trace):



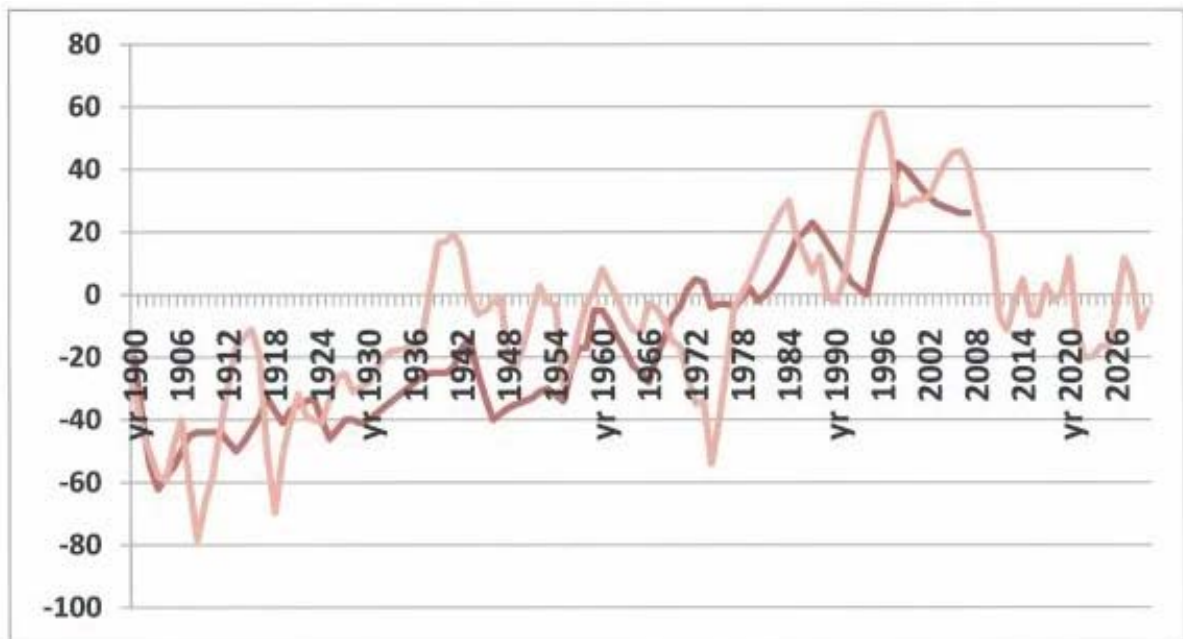
MODEL RESULTS COMMENTARY & FORECASTS GRAPH 4: AUSTRALIAN 4 YEARLY MEAN TEMPERATURE TRENDS

These results are very similar to those found from Graphs 2 & 3, IE. The Global & Southern Hemisphere Mean Temperature Trend Series Results.

The later timing of the current temperature downturn in the Australian 4 Yearly Mean Temperature Data Set, (Compared to the 3 other Temperature Series...The Global, Southern Hemisphere & the following Near Australian Southern Ocean Series), may well be due to the current extended dry-drought period (Which appears set to end, according to Holton Weather General Long Range Rainfall Trend Forecasts. This current extended dry-drought period, would be expected to influence Australia Mean Temperatures in an upwards direction via lack of grass-groundcover, less evaporative cooling, less lower and middle level cloud cover, & less albedo connections.

MODEL RESULTS GRAPH 5:

Graph 5: Holton Temperature Forecasting Model (HTFM) 1900 to 2030(Pink Trace) compared to 4 Year Running Mean Southern Ocean near Australian Sea Surface Temperature Changes 1900 to 2007(Red Trace):



MODEL RESULTS COMMENTARY & FORECASTS GRAPH 5: SOUTHERN OCEAN NEAR AUSTRALIAN 4 YEARLY MEAN SEA SURFACE TEMPERATURE TRENDS

These results are very similar to those found from Graphs 2 & 3 & 4, IE. Global & Southern Hemisphere & Australian Mean Temperature Trend Series Results.

FINAL SUMMARY, FORECASTS & CONCLUSIONS

This research paper study was undertaken to update an understanding into what climatic factors are controlling Global, Southern Hemisphere & Australian Temperatures, and also Near Australian Southern Ocean Surface Temperatures.

This whole area of research is filled with controversy, argument & counter argument, and many unproven science theories. There are "convincing-type" science theories put forward by many, including the obvious CO₂ effects, Solar-Magnetic effects, Solar-Related Cosmic Ray effects, Ocean effects, Orbital effects, Planetary effects, Albedo effects, Positive feedback effects, Negative feedback effects, Computer Model effects, etc, etc.

The popular and most publicised "CO₂ rapid catastrophic warming effect notion" has to rely on unproven positive feedbacks overwhelming negative feedbacks in the Atmosphere & Oceans to achieve the "desired" result of rapid catastrophic warming. CO₂ by itself, will only produce a modest warming on doubling its' current PPM quantity. This study, in fact, shows clearly that quite modest warming is the only result CO₂ warming has delivered since in the past 100 years, IE. A modest Global Warming of 0.26C from 1907 to 2007...And the

expectation from this year 2010 until 2107 is only another 0.69C. This figure is close to CO2 theoretical warming expectations (Without the addition of any unproven positive feedbacks).

It has also been shown clearly in this study that CO2 PPM is in itself a quite poor predictor of short to medium time frame Global-Southern Hemisphere-Australian & near Australian Southern Ocean Temperature Changes. In fact, the Table 1 results show that Solar-Magnetic effects, Nino Ocean effects and AMO Ocean effects are controlling all short and medium term Temperature Trends across all four land & ocean areas areas of the globe studied in this research.

As regards Solar-Magnetic effects, this research also shows that the lagged AA Index is clearly the most important factor in short-medium and long term temperature changes from 1900 to 2007, having shown good to very good correlations in all short-medium and long range temperature trend periods tested.

These Solar-Magnetic links to Temperature and Climate have been shown to occur previously, but their exact effects and understanding of these effects on climate and temperature are still being constantly researched.... IE. Quote." *Scientists are looking at three main mechanisms that may explain this Sun-Earth link for our weather and climate. Firstly, the Sun's varying ultraviolet emissions affect the production of ozone in the Earth's atmosphere, changing our ozone layer, and affecting the large-scale circulation of air. Secondly, the solar wind's gusts affect the electrical properties of the Earth's upper atmosphere which somehow affects the lower layers of the atmosphere. Thirdly, during the solar minimum, the solar wind is weaker which enables galactic cosmic rays (GCRs) to enter the Earth's atmosphere more easily. GCRs are particles that are heavier and more energetic than those carried by the solar wind and are accelerated much farther away in space. Scientists believe that the movement of GCRs, which is influenced by the solar wind, generates conditions that promote the formation of low-altitude clouds. The significance of each of these mechanisms is as yet unknown, and scientists also do not know if the mechanisms are interrelated. Every avenue is being explored.* "(View [Source](#) ...European Space Agency ESA)

Also, in this research study, the Ocean "temperature influencing effects" of the Pacific Nino & Atlantic AMO Areas were shown to have much significance. This was especially true for the Short & Medium Term Temperature Trends, but these Ocean climatic factors were also important in longer term temperature changes.. These Ocean factors are likely to be related to Solar-Magnetic via Solar-Magnetic-Ocean-Atmosphere teleconnections.....*It should be noted that the combined effect of the Solar-Magnetic-SOI-AMO climatic inputs is shown by this study over the Long Term 101 year period from 1907 to 2007 to have produced 73% of the 0.95C rise, compared to only 27% of the 0.95C rise by the CO2 PPM Variation.*

While it is a proven science fact that CO2 increase will cause some small warming of temperatures, it appears that most of the time the "CO2 warming effects" are overwhelmed by Solar-magnetic and Ocean effects. These results suggest strongly that at the current rate of CO2 rise the increase in Global-Southern Hemisphere-Australian-Near Australian Southern Ocean Areas will be much less than that forecast by the IPCC and many other

researchers. The factor of cutting CO2 emissions in the future obviously should still be considered in some measure. And in the author's opinion, a steady moving ahead towards a goal of cleaner & more efficient power generation, better land management & better environmental practices is always a sound and good policy for all industry, bodies & governments ...However, urgent greatly exaggerated catastrophic, impending doom talk, and hasty poor planning, based on much unproven theory, will do little to solve this small CO2 warming problem....And is likely to in fact waste money that could have been used on more effective research into agriculture, food production and other more important science matters.

The Global-Southern Hemisphere-Australian & Near Australia Southern Ocean temperature Forecasts produced by the Holton HFTM Model, show that cooler conditions are forecast to develop by Late 2010-2011, or 2012 at the latest.

Temperatures from then on are forecast by the Holton HFTM Model to return to 1945 to 1978 type values, *of around 0.4 to 0.5C below current Feb-March 2010 General Mean Temperature levels.*

This Holton Weather HFTM Model Forecast of a return to cooler mean temperatures, when combined together with other Holton Weather Forecasts of a General 7 year Wetter Growing Season Rainfall Period for the Murray Darling Basin SE Australian Areas from 2010 to 2016 (*See the Holton weather article that follows on from this one on this Web Page), should give encouragement to Australian farmers, and in fact, to all Australians in general.

Postscript: Let us all hope and pray that better climatic conditions do come to pass soon for the help of all Australians.

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