

Executive Summary

CSIRO's Climate group and One Nation team met 3 times during 2016 and 2017. Some CSIRO letters to the Minister were included. CSIRO were represented at the highest executive and scientific levels.

At all times we specified, and CSIRO acknowledged, that we sought the empirical evidence and logical reasoning proving that carbon dioxide from human activity is causing an unprecedented effect on climate.

CSIRO was asked to identify any unprecedented climate changes in the last 10,000 years. The only climate component that CSIRO addressed was temperature. CSIRO conceded that temperature itself was not unprecedented and instead claimed that only the recent *rate* of change of *temperature* was unprecedented.

Despite 40 years in climate research, CSIRO initially cited only one paper Marcott 2013 [App 8.2] in support of their claim of an unprecedented rate of warming. Yet Dr Marcott himself had publicly admitted that the paper's 20th century temperatures were not robust.

Further, the Marcott 2013 paper itself declared that the processes used could not detect variability occurring in periods shorter than 300 years. CSIRO had not read or understood the paper in its entirety.

The identical processes and data were used by Marcott for his PhD thesis, which did not show any recent warming. Marcott synthesised his results from 73 separate papers. However, after the addition of 2 UN IPCC authors and the alteration of some critical data from the referenced papers, the recent temperature uptick was created.

At the following meeting, CSIRO claimed an unprecedented rate of recent warming based on only two wildly and obviously erroneous data points in one short ice-core reported in Lecavalier 2017 [App 8.3] whose authors would not release their raw and intermediate data.

Even if there had been unprecedented recent warming, it appears to have stopped 20 years ago [App 8.1]

CSIRO's claim of an unprecedented level of atmospheric carbon dioxide was not supported by the cited paper.

CSIRO have not specified the amount of temperature change attributed to the carbon dioxide from human activity. This is due to the lack of quantified conclusions in the cited papers.

The sole paper (Harries 2001) initially cited on the effect of carbon dioxide was flawed. In response at the next meeting CSIRO cited Feldman 2015 which further refuted Harries 2001.

CSIRO refused to state that this unprecedented and unspecified human-caused temperature change could be dangerous.

CSIRO proposed a six point causal chain but failed to prove that carbon dioxide from human activity causes significant global warming.

- The first three points cited unquantified papers that could not implicate human activity in specific amounts of temperature change.
- The next two points were not based on empirical evidence and are just mere opinions.
- The final critical point was of the form "consistent with ... climate models" and is an admission of the lack of empirical evidence proving causation.

CSIRO's Climate group cited only peer reviewed papers. This peer-reviewed status was used to imply unchallengeable certainty. Yet key papers wilted on closer examination, confirming that CSIRO had not done the due diligence which would have dismissed these papers.

If CSIRO now relies on papers published in 2013 and 2017 as the supposed best that it could table in response to a senator's request after forty years supposed climate research it raises serious questions:

- In the 1980's what was the basis for PM Bob Hawke raising the political concept of human-caused climate change?
- In 1990 what was the basis for PM Bob Hawke's announcement that his government intended to cut carbon dioxide emissions 20 per cent by 2005?
- In 1996 what was the basis for PM John Howard declaring that while Australia would not sign the UN's Kyoto Protocol our country would comply with it and take farmers' property rights so that we could comply?
- In 2007 what was the basis for taking more of farmers' property rights, introducing the Renewable Energy Target and proposing an Emissions Trading Scheme (carbon tax)?

The start of public cross-examination has revealed the total lack of due diligence, competence and integrity by the publicly funded CSIRO Climate group. The descent into politicised advocacy is destroying the reputation of the once respected CSIRO.

We have asked Ministers for the basis of Australian government climate policies and they have stated that policies are based on advice from CSIRO. Cross-examination of CSIRO shows that climate policies have never been based on empirical evidence and logical scientific reasoning proving human causation.

All baseless climate policies must end immediately.

The onus of justifying policies is now on the government.

Australia needs a Royal Commission into climate science to restore scientific integrity into all government-funded climate-related science.

Introduction – how CSIRO came to be cross-examined on their evidence on climate change

I would like to thank former Minister Sinodinos and his officer Geoff Mason for arranging a series of three formal meetings between my team and a high level team from CSIRO that included the most senior climate executives, including in the first meeting, CSIRO's Chief Executive. Letters from CSIRO to the Minister continued the discussion. We thank the Minister and Geoff Mason for allowing me and my senate office staff to meet with The Chief Scientist, Dr. Alan Finkel.

I would like to thank the Father of the Senate, Liberal Senator Ian Macdonald for admitting in the final Senate sitting week of 2016 that parliament has never had a debate on climate science. Yet parliament commits three billion dollars per year based upon climate "science". Beyond this is the much greater cost to families, industry and communities of policies based on climate claims. Because of this I needed to fulfill my responsibilities as a representative of the people and did my due diligence. Fortunately, One Nation held a balance of power in the senate and I was able to hold CSIRO and The Chief Scientist accountable for their climate claim that led to these discussions.

This report summarises the results of these discussions and its [Appendix](#) contains the justification for statements made in this report and contains links to the detailed discussions themselves.

CSIRO's presentation at the [initial meeting](#) covered Australian data only from 1910 or later which was too short to indicate anything unprecedented. CSIRO apparently concurred as they then omitted this short term Australian data which was therefore not cross-examined.

The meeting was recorded on CSIRO's condition that it be only for my office's internal use. My technical response is [here](#), and my written report is [here](#).

During this first meeting, CSIRO was asked *What in the last 2,000 years of climate record indicates impending danger?* **CSIRO stated that the determination of danger was not their responsibility.** It was for the public or the Minister to determine danger.

For the next meeting I posed the following questions:

1. *What is unprecedented in the climate record of the last 10,000 years?*
2. *What proves it is caused by carbon dioxide from human activity?*
3. *What justification is there for cutting carbon dioxide emissions?*

CSIRO then responded to these questions as requested.

The document you are currently reading can be read online where the links are active and the level of detail can be varied by clicking on the small grey triangles preceding the paragraph numbers. [2017-08-09 Cross-examination of CSIRO's climate case.](#)

Timeline of interactions between Senator Malcolm Roberts and CSIRO over 14 months.

Immediately upon being sworn in as a Senator on 30 August 2016, Senator Malcolm Roberts requested from CSIRO a presentation of its empirical evidence proving that carbon dioxide from human activity affects climate and needs to be cut. CSIRO was not immediately forthcoming and while waiting the senator asserted in his maiden speech that CSIRO had no empirical evidence that human emissions of CO₂ caused any significant global warming.

On 26 September 2016 CSIRO made its presentation in Sydney and the link is [here](#). The presentation and discussion were recorded and a transcript produced but there has not been an agreement to release them.

- **CSIRO team**

- Dr Larry Marshall – Chief Executive, CSIRO (part of meeting)

- Dr Alex Wonhas – Executive Director, Environment, Energy & Mineral Resources (reports to the CEO)

- Dr Steve Rintoul - Interim Director, CSIRO Climate Science Centre (reports indirectly to Dr Wonhas)

- Ms Kimberley Shrives – Manager of Ministerial and Parliamentary Liaison

- Office of Minister Hunt**

- Alex Cooke – Secondment, Department of Industry, Innovation and Science

- One Nation team**

- Senator Malcolm Roberts

- Peter Bobroff, AM

- Darren Nelson – Economics Advisor

- Leon Ashby

- Paul Evans

- Sean Black

Thus began a loose interchange of facts and opinions. Initially we and CSIRO wasted time and effort by introducing a number of issues that became distractions. We learned from this process, eventually realising that we should confine our response to points that directly contested CSIRO's main points and that the onus of proof is on CSIRO, since Ministers and MPs, from Labor-Greens and Liberal-Nationals governments, have stated that their climate policies are based on advice from CSIRO.

Usually we learnt of CSIRO's responses indirectly when their response letters to other parties were forwarded to us.

The dialog, such as it was, occurred only because of the good grace of Minister Sinodinos' office.

2016-11-01 One Nation technical response to the CSIRO Sydney presentation. [\[interactive\]](#)

2016-11-07 A wide ranging reply by Senator Roberts to the CSIRO Sydney presentation is [\[here as a pdf\]](#).

Concurrent with the process of engaging with CSIRO, Senator Roberts requested a presentation from The Chief Scientist on the empirical evidence proving that carbon dioxide from human activity caused climate change and justifying the reduction of carbon dioxide production. On Monday 27 March 2017 The Chief Scientist and Minister Sinodinos held a discussion with Senator Roberts and his staff. After around 20 minutes the Chief Scientist appeared to realise that the Senator and his staff understood climate realities and The Chief Scientist admitted that he was not a climate scientist and did not understand climate science. The Chief Scientist and Minister agreed to hold a future discussion of four hours duration with the senator. The Chief Minister requested whether the senator would agree to him bringing climate scientists with him and the senator immediately responded stating that he was pleased for The Chief Scientist to bring anyone to the meeting that The Chief Scientist wanted.

2017-04-13 CSIRO Response is [\[here\]](#). This document was undated with the stated date being assumed from within the meta data of the pdf file. The document meta data states it was modified 12 October 2017 and states that the author was Alex Thompson, O&A St. Lucia. The document was tabled at (from memory) a senate committee meeting. It is worth noting that Senator Roberts initially asked CSIRO's Chief Executive, Dr. Larry Marshall whether CSIRO would be responding to the senator's response. The Chief Executive said CSIRO would not be responding. Senator Sinodinos as Minister for Science then directed the CSIRO to respond.

A meeting with The Chief Scientist was then being arranged for May and after this was scheduled, the Minister's staff advised that CSIRO climate group and executives would replace The Chief Scientist at the meeting.

2017-05-10 CSIRO Parliament House Presentation [here](#). The Minister for Science did not permit this meeting to be recorded. Minutes were taken but did not capture the discussion of scientific points. The senator and his staff challenged many of CSIRO's core points.

- **CSIRO team**

- Dr Peter Mayfield, Executive Director Environment, Energy and Resources, CSIRO (reports to the CEO)

- Dr Jack Steele, Director of Science Impacts Policy, CSIRO (reports to the DCEO)

- Dr Helen Cleugh, Director of the CSIRO Climate Science Centre (reports indirectly to Dr Mayfield)

- Dr Steve Rintoul, CSIRO Fellow and Research Team Leader (assumed to report directly or indirectly to Dr Cleugh)

- [CSIRO Org Chart](#)

- Office of Minister Sinodinos**

- Geoff Mason, Senior Advisor (chair of the meeting)

Dr Kate Chapple, Advisor
One Nation team
Senator Malcolm Roberts
Peter Bobroff, AM
Leon Ashby
Sean Black

2017-07-26 One Nation Response [here](#) CSIRO repeated their presentation of 2017-05-10 as it had not been recorded. One Nation's response then followed, then discussions. This meeting was recorded and a transcript produced but there has been no CSIRO approval to release them.

▪ **Attendees**

Dr Peter Mayfield, Executive Director Environment, Energy and Resources, CSIRO (reports to CEO)
Dr Jack Steele, Director of Science Impacts Policy, CSIRO (reports to DCEO)
Dr Helen Cleugh, Director of the CSIRO Climate Science Centre (reports indirectly to Dr Mayfield)
Dr Steve Rintoul, CSIRO Fellow and Research Team Leader
2017 07 26 or 29?
Peter Bobroff
Malcolm Roberts
Leon Ashby
Sean Black

<https://www.csiro.au/~media/About/Files/CSIRO-Leadership-Team-Chart.pdf>

Kate Chapple, Advisor to Minister Sinodinos
Geoff Mason, Senior Advisor to Minister Sinodinos

2017-08-09 CSIRO CEO [letter](#) responding to 2017-07-26 from One Nation.

2017-10-26 CSIRO CEO [statement](#) to Senate Estimates hearings.

This document is One Nation's response to this last CSIRO Letter

CSIRO agreed that current temperatures are not unprecedented and both papers provided in support of its claim of unprecedented rates of temperature rise failed under scrutiny.

In concentrating on *rate of temperature rise* rather than *temperature* itself, **CSIRO conceded that the current temperatures are not unprecedented.**

CSIRO initially cited only the paper: [Marcott 2013](#) [App 8.2] *A Reconstruction of Regional and Global Temperature for the Past 11,300 Years*

The paper's [Gain Function plot](#) [App 8.2.6] shows that the process used could not detect any event that spanned less than 300 years.

Comparisons with other datasets for a period of 1000 years shows the Marcott process is relatively unable to detect any variation.

The entire 150 year thermometer record is undetectable by the Marcott process. This means that the Marcott process could not have detected a past occurrence similar to the current climate cycles. Thus the current cycles cannot be known to be unprecedented.

CSIRO showed a misleading graph from *Marcott 2013* that ended with a violent uptick in temperatures even though Marcott himself admitted: *"the 20th century portion of our paleo-temperature stack is*

not statistically robust, cannot be considered representative of global temperature changes". The fabrication of the final uptick is covered in detail [here](#).

When my objections dismissed *Marcott 2013*, CSIRO then cited *Lecavalier 2017* [App 8.3] *High Arctic Holocene temperature record from the Agassiz ice cap and Greenland ice sheet evolution*. Comparison of Lecavalier's 1960 and 1985 temperatures with the four main global temperature series, shows that these two temperatures are wildly wrong.

Any rate of change derived from these two points is even more wildly and obviously wrong. [App 8.3.1]

What is claimed to be unprecedented in this paper is **one data point** in a short additional ice-core appended to two 10,000 year ice-cores analysed 30 years earlier with apparently different instruments from the recent short core instrument. Unlike *Marcott 2013*, **no Gain Function plot** is given. **The lead author withheld the raw data** that might have helped determine whether changes similar to the current changes could have been detected in the long cores.

When my objections dismissed *Lecavalier 2017*, CSIRO failed to provide any evidence to support their claim of unprecedented rate of temperature rise.

CSIRO asserted that the current CO2 concentrations are unprecedented yet there are gaps of up to 6,000 years in the data.

Whether or not CO2 is unprecedented is irrelevant. Unlike temperature, rainfall, snowfall, wind speed and storm frequency, CO2 is not a "climate" component. If it was not for the alleged affect on temperature, higher CO2 would be welcomed for its beneficial effect on plant growth.

CSIRO cited only *Luthi 2008* [App 8.4] *High-resolution carbon dioxide concentration record 650,000 – 800,000 years before present*, which included data from the Vostok ice core that has very sparse samples between 120,000 BCE and 20,000 BCE. There is one period of 6,000 years without a sample and almost no sample intervals shorter than 1,000 years for 100,000 years. [App 8.4.2] The modern change of 90 ppm in only 60 years was **undetectable** in this data and the **CSIRO claim of unprecedented is not supported by the cited data**.

From this paper it is not possible to conclude that the current level of CO2 is unprecedented in the last 10,000 years.

CSIRO asserted that humans have caused climate change

None of CSIRO's six points specified the amount of change allegedly caused by humans.

CSIRO asserted that carbon dioxide is a greenhouse gas whose concentrations in the atmosphere have increased.

I generally agree with the assertion that carbon dioxide absorbs and emits long wave radiation and that the level of CO2 in the atmosphere is increasing but I consider the term *greenhouse gas* to be misleading.

CSIRO asserted that the extra carbon dioxide in the atmosphere comes from human activities.

I accept that some molecules of carbon dioxide that originated from human activities during a year may remain in the atmosphere at the end of the year but conclude that (on the evidence provided) all of the extra carbon dioxide is unlikely to come from human activities.

CSIRO omitted to mention the huge natural seasonal flows in and out of the atmosphere that dwarf any human flows. These flows are likely to be influenced by many changing natural environmental factors.

While there may be plausibility in the isotopic CO₂ composition point, it is contested by some geologists and volcanologists.

Similarly I would accept the oxygen concentration point if the data covered 2,000 years otherwise it could be just a short term random correlation. CSIRO provided data on oxygen only from 1991.

CO₂ may be somewhat correlated with human emissions but **correlation without causation is a weak argument.**

CSIRO misled by showing a graph of the "Land Sink of CO₂" as if it were empirical data when it is just the residue which is unaccounted for by other empirical data or simulations. **Not contested by CSIRO.**

CSIRO asserted that the additional carbon dioxide added to the atmosphere by human activities has enhanced the greenhouse effect: less energy is leaving the top of the atmosphere in the wavelengths absorbed by carbon dioxide and other greenhouse gases.

CSIRO have not claimed that this effect has caused even **one hundredth of a degree** of temperature rise.

CSIRO cited *Harries et al 2001* [Ref 1] *Increases in greenhouse forcing inferred from the outgoing longwave radiation spectra of the Earth in 1970 and 1997*

The paper **compares satellites carrying dissimilar instruments** 27 years apart.

The paper **excluded the main absorption band of CO₂** because it was **"too noisy"**.

Conclusions were drawn from **2 arbitrary points** in a noisy time series (high variation). This is statistically unsound and raises serious concerns about CSIRO's intent and competence.

CSIRO mis-labelled Harries' Fig 1c which does not show the empirical data measured by the satellites. Instead, it shows the component of the *simulated* spectrum (not defined) that includes only the effect of trace-gas changes between 1970 and 1997 (omitting temperature and humidity changes) to aid interpretation.

At our subsequent meeting CSIRO cited *Feldman et al 2015* which states that *Harries 2001* was **complicated by uncertainties in instrument performance, short measurement records from each instrument, and cloud contamination.**

When our objections dismissed *Harries et al 2001*, CSIRO then cited *Griggs and Harries 2007* [Ref 2] *Comparison of spectrally resolved outgoing longwave radiation between 1970 and 2003*

This paper added measurements from another more recent satellite but left the **disputed points still unaddressed.**

CSIRO then cited *Chapman, D.; Nguyen, P.; Halem, M., 2013* [Ref 3] *A decade of measured greenhouse forcings from AIRS*

This paper overcomes some objections to the Harries papers but its findings are also expressed as changes in radiance. It is easier for people to relate to changes in temperature (deg K) or at least flux (watts/sq metre). This requires further computation. Our approaches seeking data through Dr Halem have not resulted in the required data being made available. Therefore this paper lacks any **quantified significance on temperature**.

CSIRO then shifted ground from CO2 to ozone. **This is not relevant to a point on CO2.**

In citing Feldman et al 2015 and Philipona et al 2004 CSIRO then **changed the subject** from the top of the atmosphere to the planet surface where it is plausible that under some conditions downwelling longwave radiation can sometimes be found to increase as CO2 concentration increases if sufficient other variables are "controlled for" by models or theory. These papers only spanned 10 years or less - a period that would not justify inclusion in a major temperature time series. Neither paper specified the amount (if any) of human causation.

CSIRO asserted that the earth has warmed as a result of the enhanced greenhouse effect.

I find this claim to be **wildly misleading** as the provided evidence on this point shows only some warming periods since 1900 (not unprecedented) and not linked by any evidence to any claimed enhanced greenhouse effect.

There is no data or logical reasoning cited here in support of this opinion.

CSIRO asserted that observed changes in the climate system are consistent with an enhanced greenhouse effect.

What observed changes? In **what quantity**? From **when** to when? By **how much**?

What specific quantified changes are being claimed for the *enhanced greenhouse effect* and on what quantified empirical evidence do these claims rest?

This claim is **imprecise and weak**.

There is no data or logical reasoning cited here in support of this opinion.

CSIRO asserted that other forcings (e.g. volcanoes, the sun, internal variability) cannot explain the magnitude, timing and distribution of observed trends.

I agree that climate science's understanding of these other forcings cannot explain very much. CSIRO did not specify exactly which observed trends could not be explained or the extent of their examination of possible alternative forcings.

There is no data or logical reasoning cited here in support of this opinion

After our third meeting with CSIRO, the CSIRO climate group tabled four large documents whose conclusions are not traceable to empirical evidence.

We reject these as secondary sources (hearsay). We invite CSIRO to provide independently reviewed traceability within these documents. That is, if CSIRO wish to cite individual statements within these documents we will be pleased to scrutinise these claims provided the statements are referenced to scientific documents providing specific data and logical reasoning showing proof of causation. The late documents from CSIRO follow:

The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change

PAGES 2k Consortium (2013). Continental - scale temperature variability during the past two millennia.

PAGES2k Consortium (2017). A global multiproxy database for temperature reconstructions of the Common Era.

North Report - Surface temperature reconstructions for the last 2,000 years

Conclusions and Recommendations

- CSIRO's evidence for unprecedented change was easily refuted and a major breakdown of the peer-review system was revealed (*Marcott 2013*).
- CSIRO provided no quantified evidence that humans are responsible for any particular amount of change.
- CSIRO would not attribute Danger and have not provided evidence to allow anyone else to attribute Danger.
- CSIRO stated that the determination of danger was a matter for the public or the Minister
- **Australian climate policies have never been based on empirical evidence and logical scientific reasoning.**

Research Quality. After reviewing some of the peer-reviewed papers cited by CSIRO, it is inconceivable that government policy should be based upon the assumption that a peer-reviewed paper states the truth, the whole truth and nothing but the truth.

Characteristics of current Peer Reviewed research

All raw and intermediate data is not publicly archived, even if the journal policy requires it.
Researchers may work for organisations whose funding depends on the conclusions of the research.
Papers may cite data that has never been independently replicated.
All calculations are seldom if ever checked by the reviewers.
Statistical analysis need not be reviewed by independent statisticians.
The peer-review process is usually secret and therefore lacks accountability. Peer review can be done by mates and has been used to block opposing views.

Requirements for Policy Quality research

All raw and intermediate data must be publicly archived.
Data collection should be independently replicated whenever possible.
All calculations must be independently and openly checked and duplicated.
All statistical analysis and claims must be reviewed by independent statisticians.
Researchers may not work for organisations whose funding depends on the conclusions of the research.
All involved authors, reviewers, editors must declare their relationships and show all communications concerning the paper.

As the premier government funded climate science agency CSIRO's gross deficiencies need to be investigated to establish the reasons for deterioration. Government-funded science then needs to be brought up to a standard sufficient to justify taxpayer funding of science and to justify the basing of policy on public agency claims.

Australia needs a Royal Commission into climate science to restore scientific integrity into all government-funded climate-related science.

The fact that CSIRO abrogated claims of Danger to government ministers reveals that it has been afraid to speak out about obvious politically-driven deviations from science.

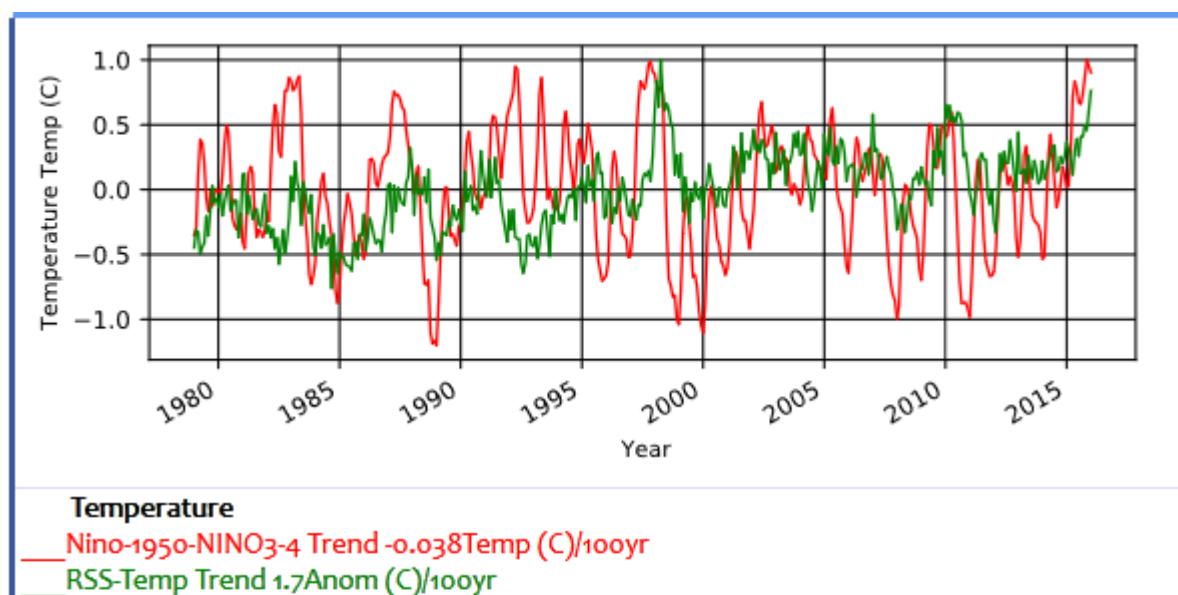
Accountability needs to be restored both for research and presenting scientific conclusions as well as for scrutinising political claims supposedly based on science.

The CSIRO Climate group's case is not adequate for, and does not justify spending, tens of billions of dollars. Not does it justify the destruction of trillions of dollars of wealth as a result of climate policies that hurt families, export jobs and erode national security.

The onus is now on the federal parliament to scrap climate policies unless CSIRO can provide the empirical scientific evidence combined with logical scientific reasoning that prove human causation of climate variability.

APPENDIX

When the El Ninos of 1997 and 2016 are considered, it seems the temperature has not risen since 1996.



Nino-1950-NINO3-4: Nino-1950-NINO3-4NOAA Nino 3.4 (5North-5South)(170East-120West

Data source: <http://www.cpc.ncep.noaa.gov/data/indices/ersst4.nino.mth.81-10.ascii>

Notes on data: <http://www.cpc.ncep.noaa.gov/data/indices/>

Processing:

RSS-Temp: RSS TemperatureRSS Raw data was lower troposphere monthly means.

Data source: ftp://ftp.remss.com/msu/monthly_time_series

/RSS_Monthly_MSU_AMSU_Channel_TLS_Anomalies_Land_and_Ocean_v03_3.txt

Notes on data: <http://www.remss.com/measurements/upper-air-temperature>

Processing:

Could *Marcott 2013* [Ref 4] show an unprecedented rate of global warming?

The 73 datasets used were well spread in latitude and could make some claim to global significance but the undocumented adjustment of some of the cited input data casts a deep shadow over a paper with some good qualities.

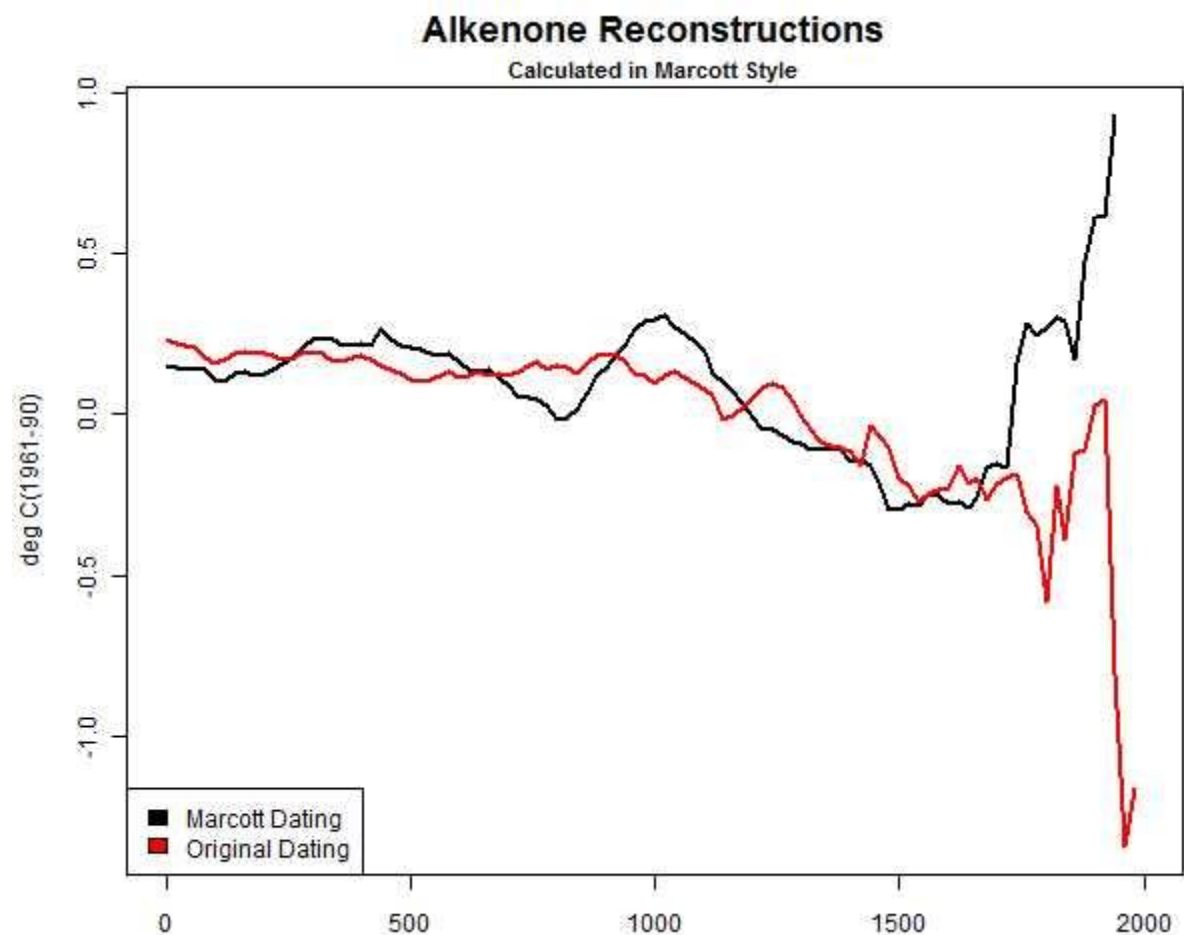
The peer-reviewed literature would have given CSIRO no cause for concern however the lead author Marcott himself admitted: *the 20th century portion of our paleotemperature stack is not statistically robust, cannot be considered representative of global temperature changes* The statement in RealClimate [Ref 14]

Alkenones [Ref 18] are long-chain unsaturated methyl and ethyl n-ketones produced by a few phytoplankton species which are used in organic geochemistry as a proxy for past sea surface temperature.

Effects of redating core tops on alkenone reconstructions.

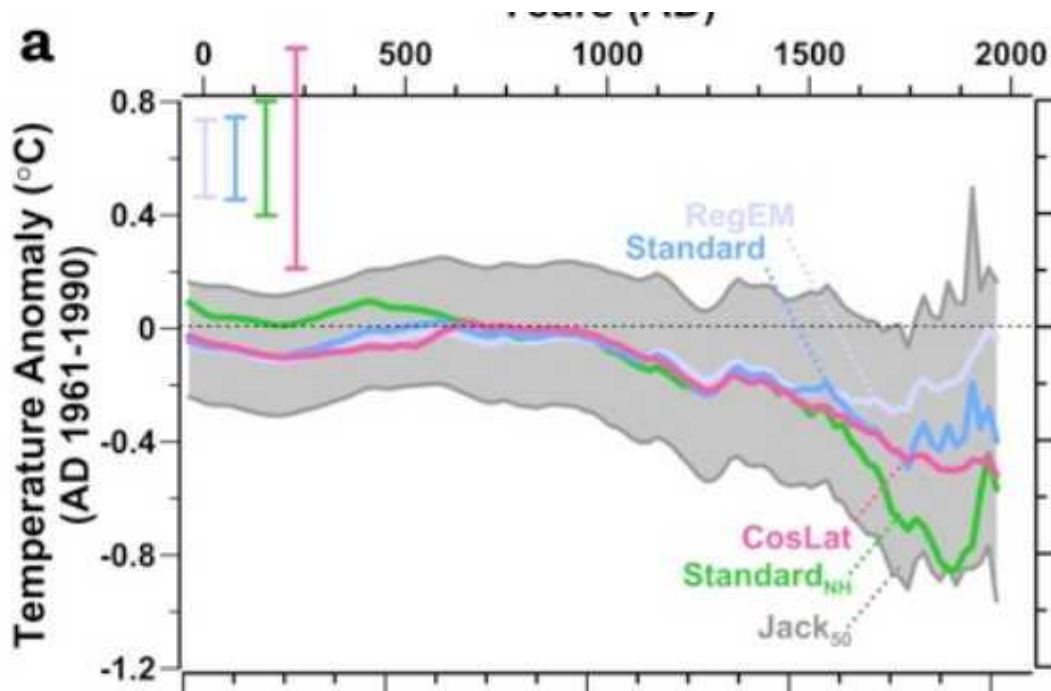
Marcott 2013 stated *Core tops are assumed to be 1950 AD unless otherwise indicated in original publication.*

However, something more than this is going on. In some cases, Marcott et al have re-dated core tops indicated as 0 BP in the original publication. (Perhaps with justification, but this is not reported.) In other cases, core tops have been assigned to 0 BP even though different dates have been reported in the original publication. In another important case (of YAD061 significance as I will later discuss), Marcott et al ignored a major dating caveat of the original publication.



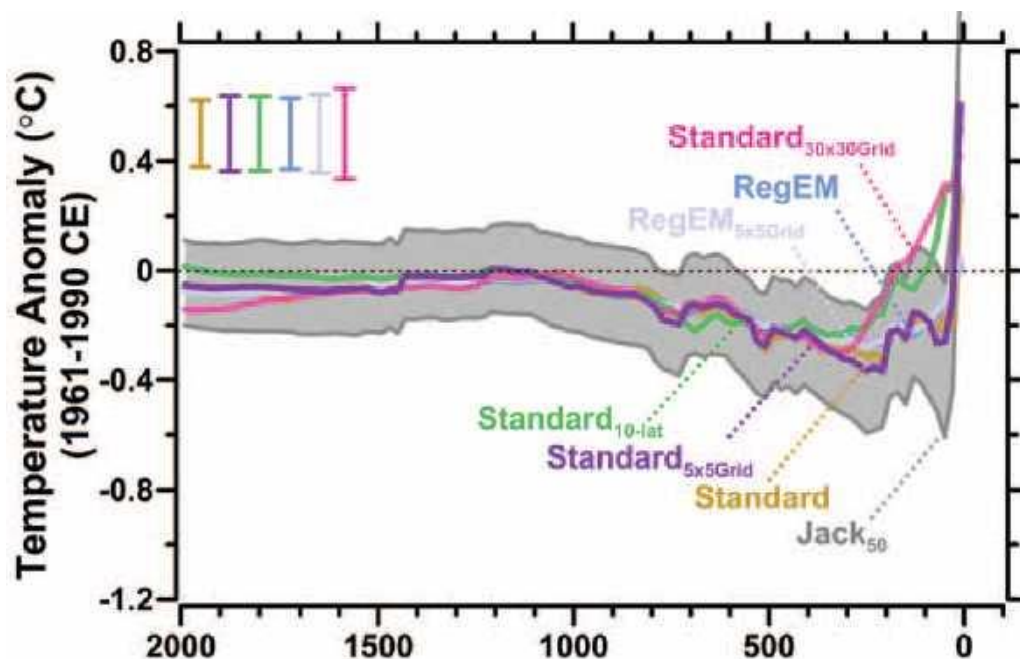
Marcott's PhD thesis used the same 73 proxies and has no uptick. The PhD thesis [Ref 15]

- PhD thesis graph.
It is not necessary to fully understand this graph but enough to notice that there is no violent uptick on the right hand side.
The x axis is years CE



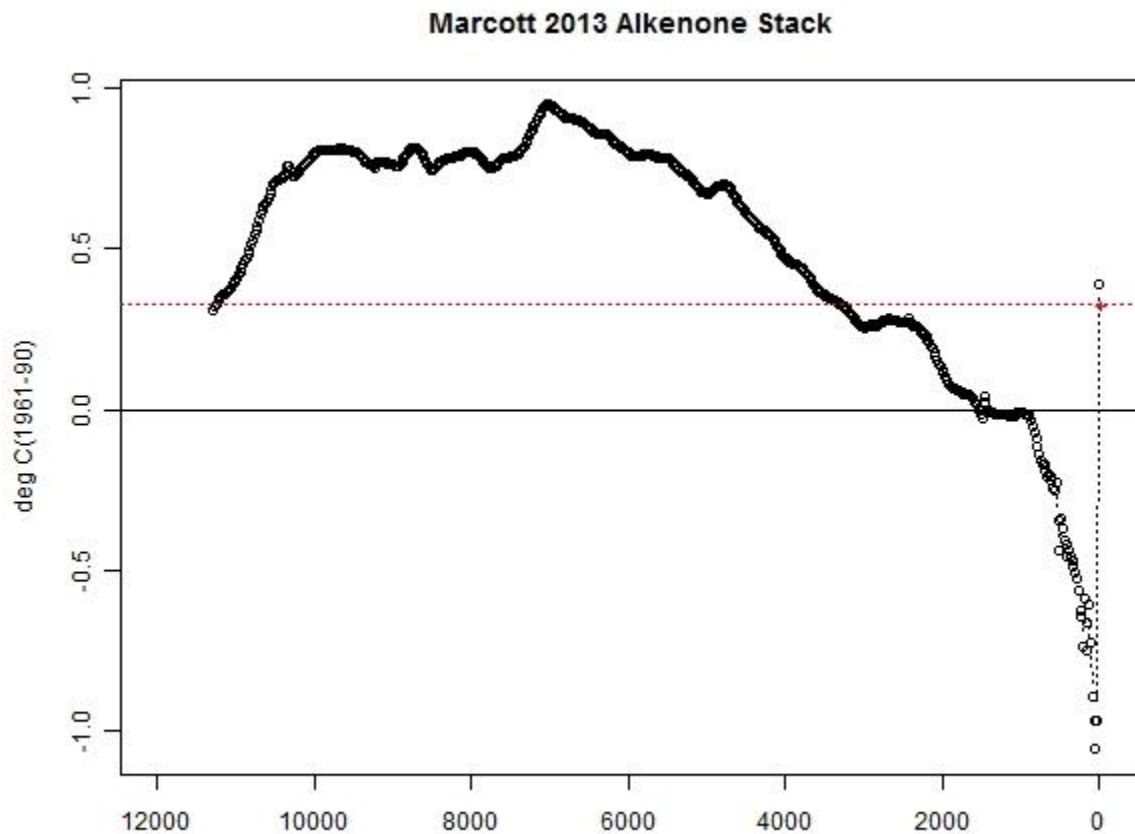
The paper: Marcott 2013 used the same data as the PhD thesis. The uptick was created by inadequately documented changes to the dates of a few alkenone core tops that shifted a few samples into the 20th century. This was apparently done without the knowledge or concurrence of the researchers (of the 73 proxies) who originally collected and dated the cores.

- Graph in final paper.
It is not necessary to fully understand this graph but to notice that there is now a violent uptick on the right hand side.
The x axis is years before present.

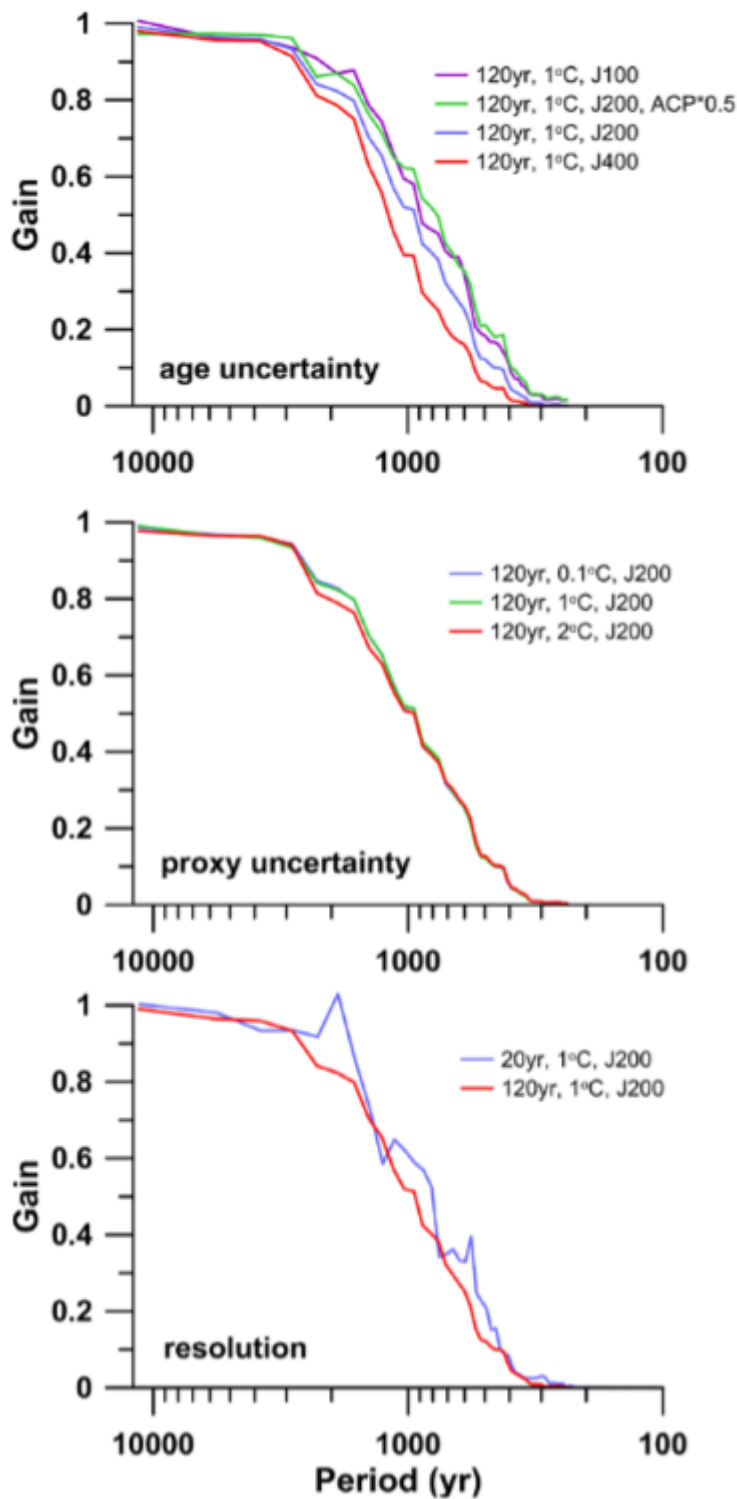


[Steve McIntyre](#) [Ref 16] suspected that the new uptick would probably be caused by changes to the Alkenone processing. Plotting the Alkenone points, he found that the uptick resulted from only one point. This 1920-1940 up tick is an extreme outlier.

The Alkenone stack refers to the 35 time series that have been combined to form the graph. The x axis is years before present.



The [Supplementary Information](#) [Ref 17] for *Marcott 2013* contained **Gain Function Plots**. These are extremely important but are rarely provided. The Gain Functions showed that the Marcott process was unable to detect any changes faster than a sine wave with a 300 year period. The process detected perfectly only changes slower than periods of 3,000 years. It is ludicrous to suggest that the Marcott process could detect changes similar to the recent 50 years in any of the previous 10,000 years.

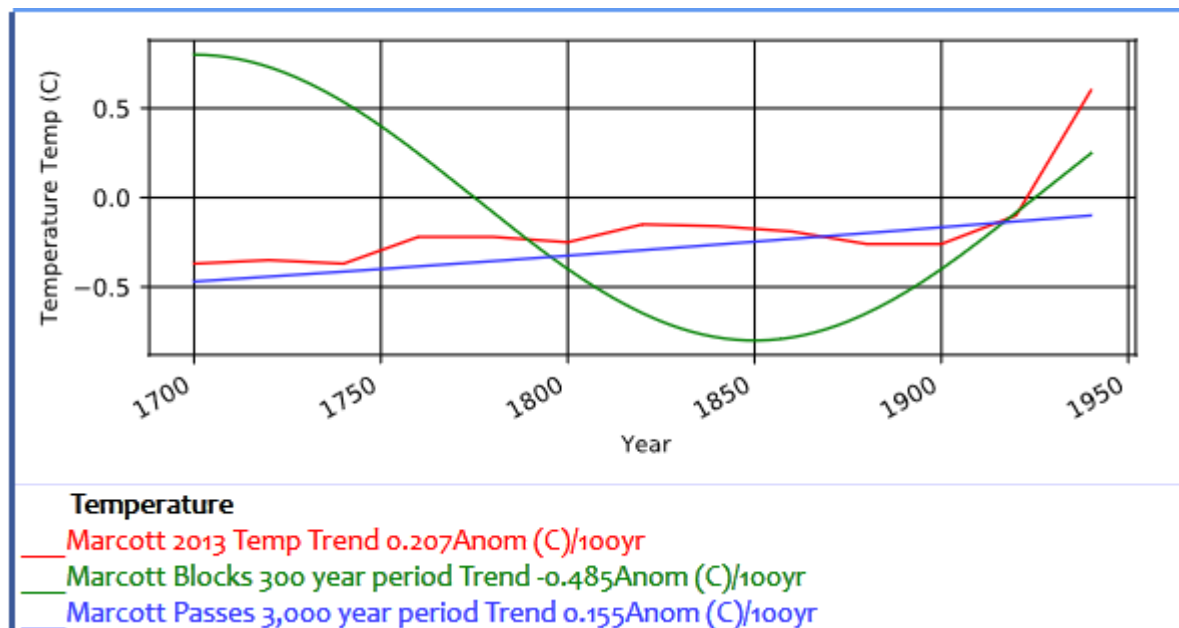


Comparison of Marcott Temperature plot (red) with plots of 300 yr and 3,000 yr periods.

The Marcott process will pass all signals slower than the blue 3,000 year plot but will totally suppress all signals faster than the green 300 year plot.

The final uptick on the red plot is too fast to be registered by the Marcott process. It seems to have been grafted on. There is no possibility that similar occurrences could have been detected in the previous 10,000 years.

Marcott 2013 cannot prove that the last rate of change is unprecedented.

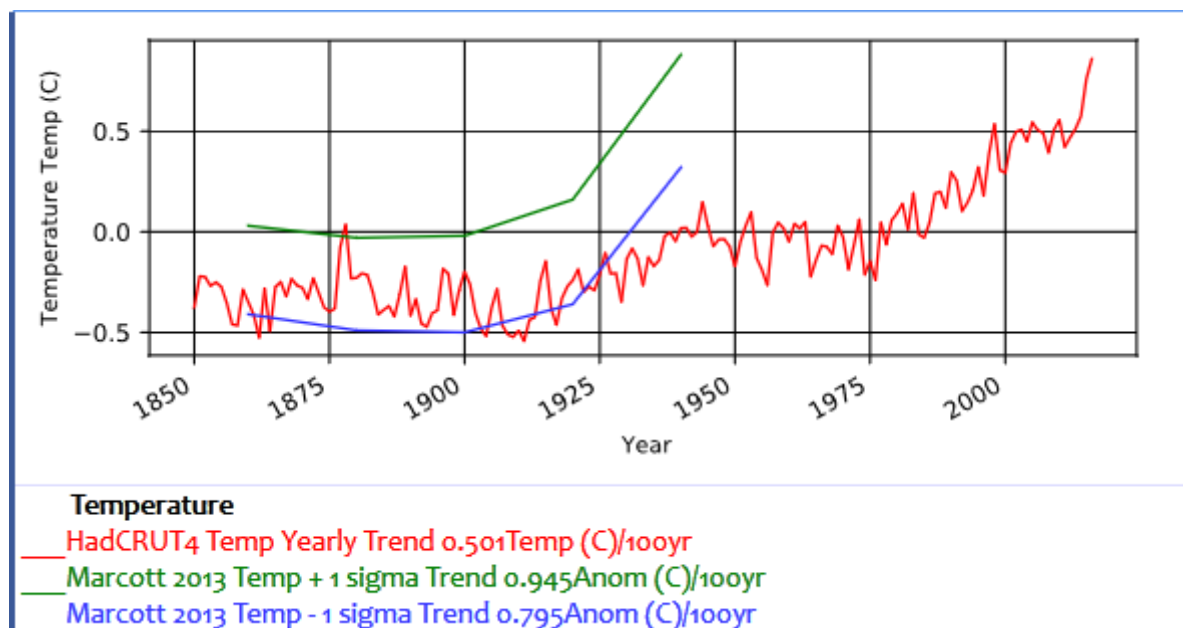


Comparison of Marcott with HadCRUT4 thermometer temperatures

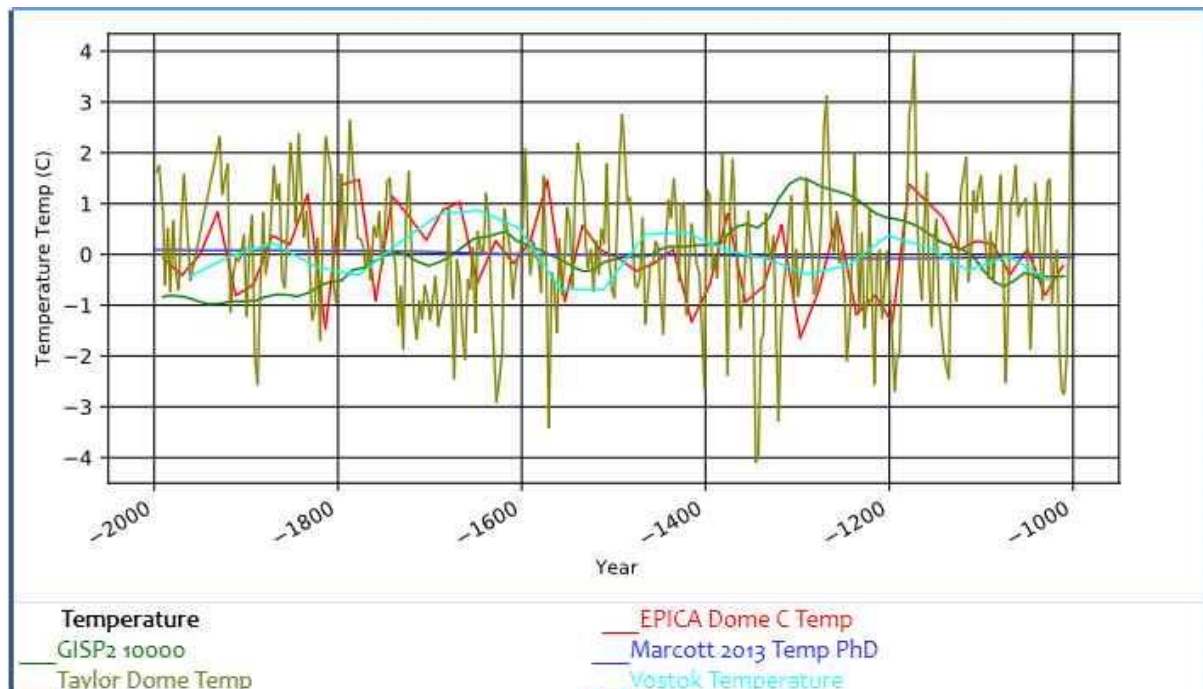
The blue and green plots are the Marcott reconstruction showing uncertainty of 1 standard deviation.

The red plot is the HadCRUT4 thermometer record.

It is obvious that the last plot point on Marcott is an outlier. The previous points are in good agreement with HadCRUT4 but **the last point is invalid**.



Comparing Marcott 2013 with other time series covering -2,000 to -1,000 BCE shows that the Marcott process is almost **unable to detect any of the variation in temperature** at all. No wonder the recent changes appear unprecedented.

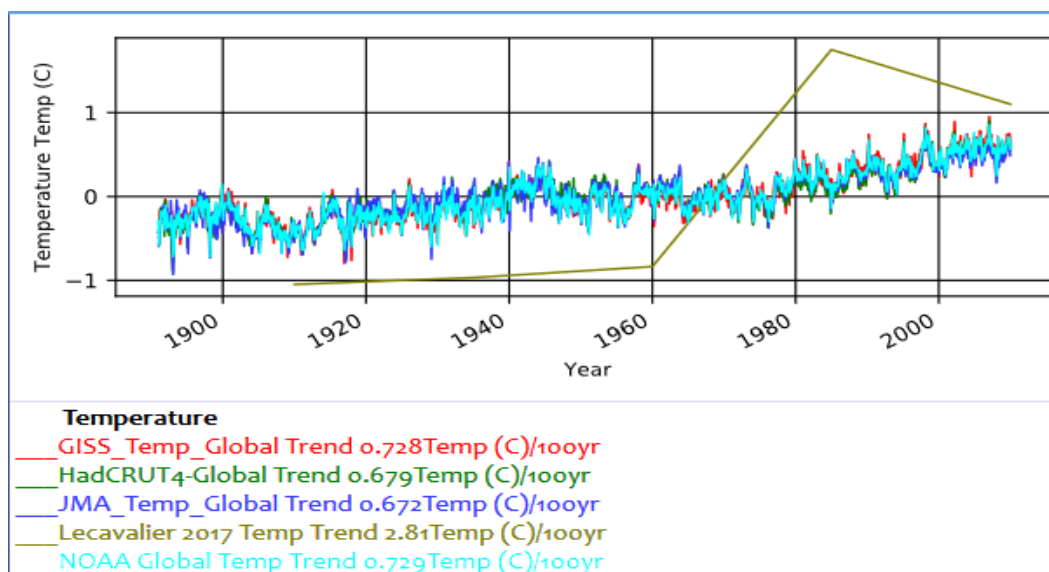


Lecavalier 2017 [Ref 5] does not show an unprecedented rate of global warming.

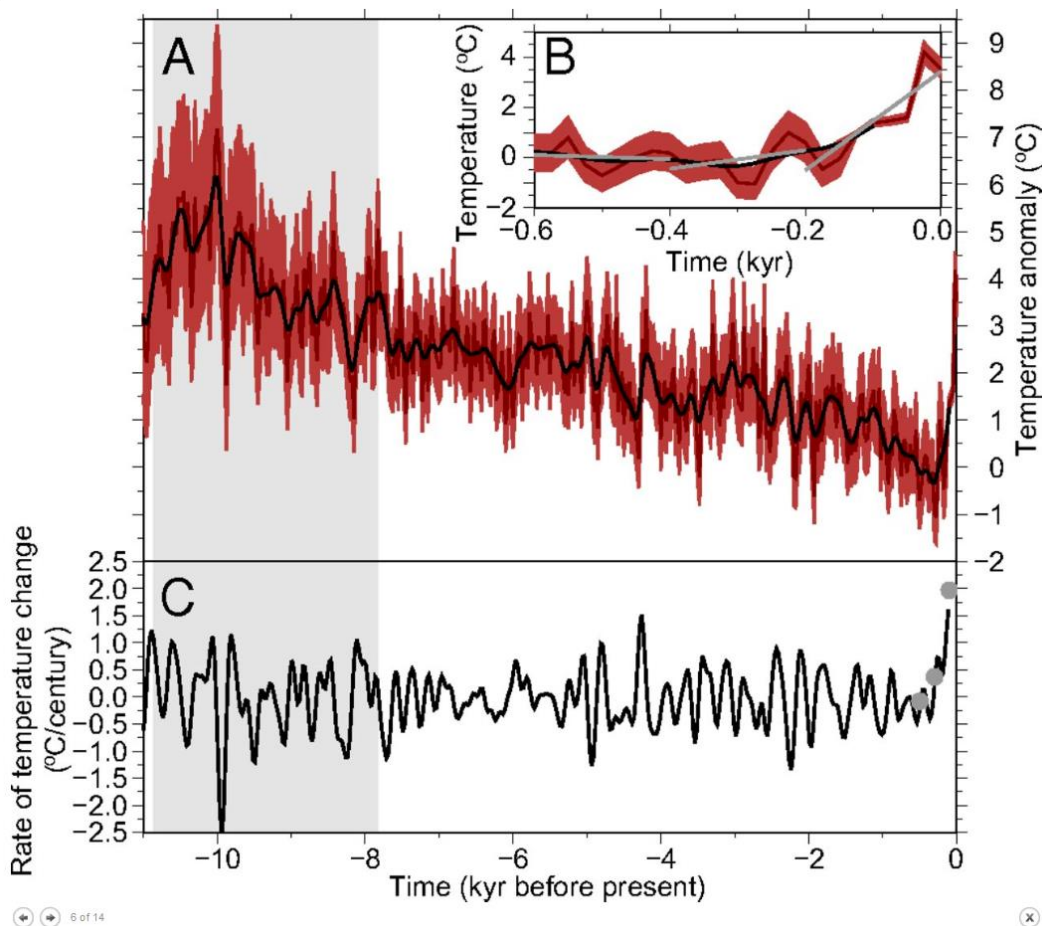
Only one location on the Agassiz ice cap at 80 deg north was sampled which can hardly claim global significance.

The short core, that was spliced on to the end of the long cores, was able to detect changes that were undetectable in the long cores. This is not good for **unprecedented** claims.

Comparison of Lecavalier 1960 and 1985 temperatures with the four major global thermometer series shows that the two points are wildly and obviously wrong. Any rate of change derived from these two points will be even more obviously wrong.



The major plot shows a final one point uptick on a steadily declining temperature.



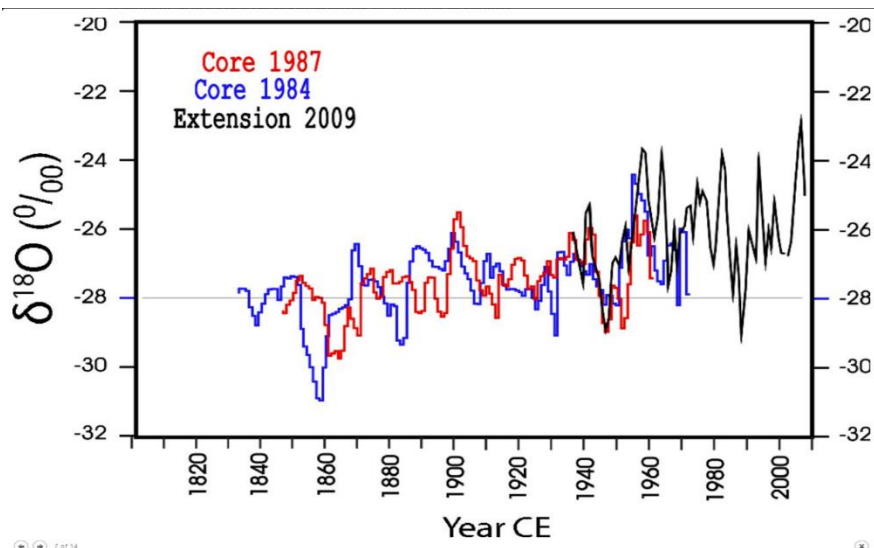
The 2 long cores and the short additional core are shown at one year resolution.

As claimed there is enough agreement in the 35 years of overlap to align the time scales.

However the disagreement between the 2 long cores sometimes exceeds the unprecedented amount of the final uptick.

The difference in variance between the long cores and the short core is obvious. They are not measuring the same quantity to the same quality.

The full one year datasets for all cores was requested from the authors but not provided.

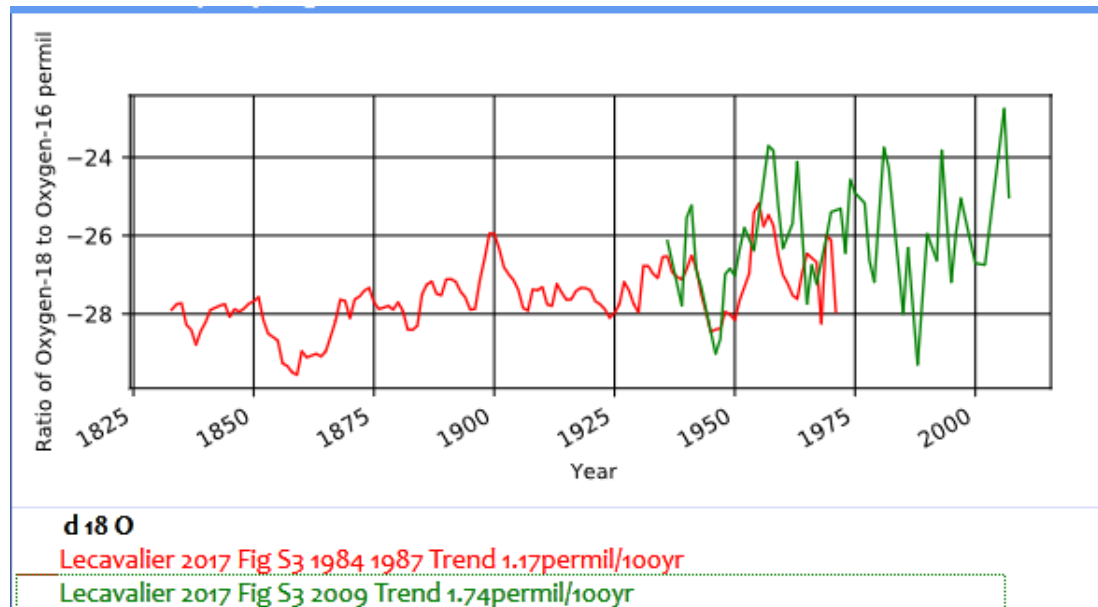


Here the 2 long cores have been combined to their mean.

The difference in variance is now very obvious.

We are getting a glimpse of the missing Gain Function plot.

The long cores are incapable of measuring the rapid changes detected in the short core, so the paper cannot claim unprecedented rates of change.



Lecavalier 2017 Fig S3 1984 1987: Lecavalier 2017 Fig S3 1984 1987 Combined from Lecavalier 2017 Fig S3 1984 series and 1987 series

Processing:

Lecavalier 2017 Fig S3 2009: Lecavalier 2017 Fig S3 2009 Journal Digitised from a graph

Notes on data: <https://doi.org/10.1016/j.quascirev.2012.11.030>

The short core does not correlate very well with 3 modern temperature series from high arctic This means the short core is not representative of what is actually happening in the Arctic, let alone the whole planet..

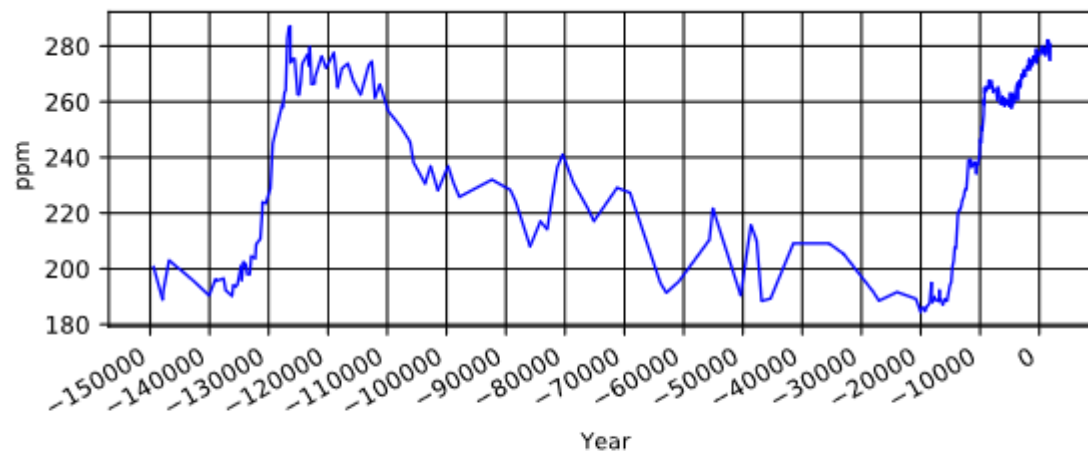
How can CSIRO rely upon the use of two differing sets of instruments and still make a claim of one result being unprecedented? It's bad enough combining data from two different instruments yet this becomes even worse when differentiating the data to assess rate of change. To assess rate of change both instruments must have the same variance.

The researchers should have measured the same section of ice cores with the old instruments and the new instruments. Without this, comparing rate of change is highly suspect.

Luthi 2008 [Ref 6] does not show current CO2 concentrations in the atmosphere are unprecedented over at least the last 800,000 years.

Rather, it showed that none of its sample points [Ref 7] recorded a value greater than the current CO2 level. Unfortunately there was a period of 6,000 years without a sample point and for about 100,000 years the sampling was never more frequent than once every 1,000 years.

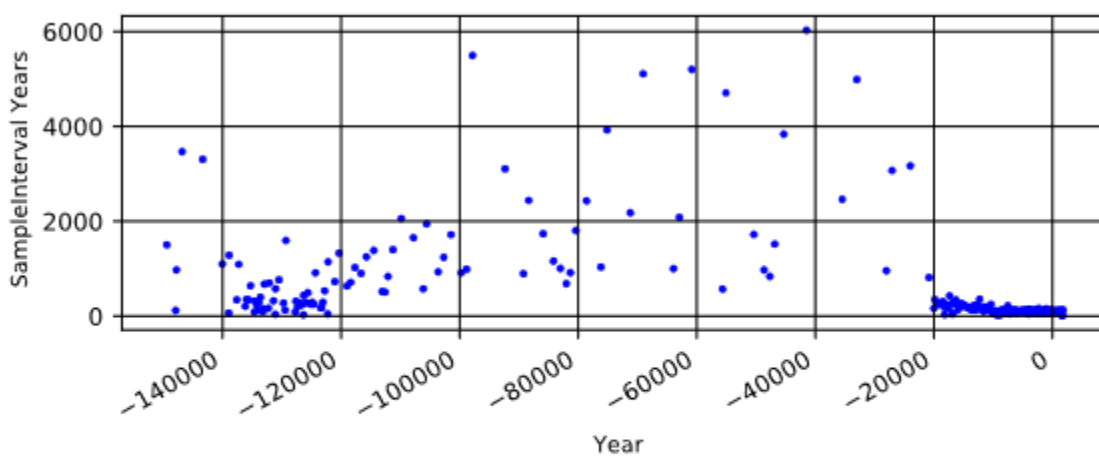
The Vostok CO2 data from 150,000 BCE



[EPICA Dome C CO2 Composite](#)

EPICA-Dome-C-CO2-Composite NOAA Data source: ftp://ftp.ncdc.noaa.gov/pub/data/paleo/icecore/antarctica/epica_domec/edc-co2.txt

The Vostok sample intervals from 150,000 BCE.



[EPICA Dome C CO2 Composite](#)

EPICA-Dome-C-CO2-Composite NOAA Data source: ftp://ftp.ncdc.noaa.gov/pub/data/paleo/icecore/antarctica/epica_domec/edc-co2.txt
Processing:, Sample Interval

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These are provided for readers of a printed copy.

Readers will have to manually remove any line feed characters within these links.

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Ref 6: https://www.researchgate.net/publication/5370384_High-resolution_carbon_dioxide_concentration_record_650000-800000_years_before_present

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