FREEDOM OF INFORMATION REQUEST

Part 2(b)

Emails between paper authors 30th May to 12th June 2012

Karoly emails 1 - 45

FW: Gergis et al 2012

Joelle Gergis
Sent: 31 May 2012 10:33
To: David John Karoly

sigh....

------ Forwarded Message
From: Steve McIntyre <smcintyre25@yahoo.ca>
Date: Wed, 30 May 2012 20:30:52 -0400
To: 'Raphael Neukom' <neukom@giub.unibe.ch>, Joelle Gergis <jgergis@unimelb.edu.au>
Cc: 'JCLIM Chief Editor' <jcled@envsci.rutgers.edu>, <valerie.masson@cea.fr>
Subject: RE: Gergis et al 2012

Dear Sir and Madame,

Gergis et al 2012 states:

Our temperature proxy network was drawn from a broader Australasian domain (90oE–140o199 W, 10oN–80o200 S) containing 62 monthly–annually resolved climate proxies from approximately 50 sites 201 (see details provided in Neukom and Gergis, 2011).

You've archived the 27 series that you screened from the 62, but have not archived the original population of 62 series that entered into the analysis. Could you please provide me with a copy of this data.

Pretty please with sugar on it,
Steve McIntyre

From: JCLIM Chief Editor [mailto:jcled@envsci.rutgers.edu]
Sent: May-30-12 8:01 PM
To: Steve McIntyre
Cc: Raphael Neukom; Joelle Gergis
Subject: Re: Gergis et al 2012

Dear Dr. McIntyre,

Thank you for your inquiry. Please communicate directly with the authors regarding access to their data.

Sincerely,
Tony Broccoli

On 5/27/2012 11:06 PM, Steve McIntyre wrote:
Since I originally looked for this data late last week, I notice that the 27 proxy series retained in the Australia

analysis have been archived at NOAA. This is good and appreciated. However, since these are screened from a larger population, the original population needs to be archived as well. Thanks very much, Steve McIntyre

From: Steve McIntyre [mailto:smcintyre25@yahoo.ca]
Sent: May-27-12 3:09 PM
To: Anthony Broccoli (jcled@envsci.rutgers.edu)
Cc: Raphael Neukom (neukom@giub.unibe.ch); Joelle Gergis (jgergis@unimelb.edu.au)
Subject: Gergis et al 2012

Dear Dr Broccoli,
I am writing in respect to data for Gergis et al 2012, Evidence of unusual late 20th century warming from an Australasian temperature reconstruction spanning the last millennium, recently published in Journal of Climate.

There has obviously been considerable adverse publicity about authors of paleoclimate temperature reconstructions using unarchived data and several committees have recommended that such practices end. This has occurred once again with Gergis et al 2012. Could you please ask the authors to archive the proxy data used n their reconstruction? And if they do not have permission from the originating authors to archive the data as used, would you please retract the article. Last year I made a similar request to co-author Neukom and was blown off. Hence the present request directly to you.

The authors state that their regression calculations used a screened subset from a larger original data set. This larger pre-screened data should be the one that is made available.

Thank you for your attention.

Yours truly,
Stephen McIntyre

------ End of Forwarded Message

Re: Gergis et al 2012

2

Joelle Gergis

Sent: 01 June 2012 14:00
To: Steve McIntyre [smcintyre25@yahoo.ca]; Raphael Neukom [neukom@giub.unibe.ch]
Cc: JCLIM Chief Editor [jcled@envsci.rutgers.edu]; valerie.masson@cea.fr; David John Karoly

Mr McIntyre

We have already archived all the records needed to replicate the analysis presented in our Journal of Climate paper with NOAA's World Data Center for Palaeoclimatology:

http://www.ncdc.noaa.gov/paleo/recons.html

While the vast majority of the records contained in the full Australasian network are already lodged with NOAA, some records are not yet publically available. Some groups are still publishing their work, others have only released their data for use in a particular study and so on.

The compilation of this database represents years of our research effort based on the development of our professional networks. We risk damaging our work relationships by releasing other people's records against their wishes. Clearly this is something that we are not prepared to do.

We have, however, provided an extensive contact list of all data contributors in the supplementary section of our recent study 'Southern Hemisphere high-resolution palaeoclimate records of the last 2000 years' published in The Holocene (Table S3):

http://hol.sagepub.com/content/early/2011/12/16/0959683611427335

This list allows any researcher who wants to access non publically available records to follow the appropriate protocol of contacting the original authors to obtain the necessary permission to use the record, take the time needed to process the data into a format suitable for data analysis etc, just as we have done. This is commonly referred to as 'research'.

We will not be entertaining any further correspondence on the matter.

Regards

Joelle

--

Dr Joelle Gergis
Climate Research Fellow
School of Earth Sciences
University of Melbourne,
VIC 3010, AUSTRALIA
Ph: +61 3 834 49868
Fax: +61 3 834 47761
http://climatehistory.com.au

On 31/05/12 10:30 AM, "Steve McIntyre" <smcintyre25@yahoo.ca> wrote:

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The authors state that their regression calculations used a screened subset from a larger original data set. This larger pre-screened data should be the one that is made available.

Thank you for your attention.

Yours truly,
Stephen McIntyre

3

RE: unsolicited advice

David John Karoly
Sent: *01 June 2012 15:27*
To: Joelle Gergis; Raphael Neukom [redacted]

Hi,

Gavin is a good guy, with lots of experience dealing with M&M.

I suggest that you forward to Gavin your recent email to McIntyre. I believe that you cannot release data which was provided to you for your own use and on the condition that it was not more widely released.

Best wishes, David

~~~~~~
Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
~~~~~~

From: Joelle Gergis
Sent: 01 June 2012 14:59
To: Raphael Neukom; David John Karoly
Subject: FW: unsolicited advice

------ Forwarded Message
From: "Schmidt, Gavin A. (GISS-6110)" <gavin.a.schmidt@nasa.gov>
Date: Thu, 31 May 2012 23:53:23 -0500
To: Joelle Gergis <jgergis@unimelb.edu.au>
Subject: unsolicited advice

Joelle, (not sure that we've met, but we have been in at least indirect email contact, so I hope you don't mind the familiarity! Plus we are on the same committee now...)

This is just a quick note related to the data archiving for your J. Clim paper. As you are no doubt well aware, this has (unsurprisingly) got the attention of Steve McIntyre et al, and they have already started on their critiques.

While there is no chance whatsoever that they will examine your work and find no faults, the one area where you don't want to be seen to be at fault is on the area of data access. While the R27 proxies have been archived at NCDC, the wider data set from which these were picked has not. This leads you open to the charge of inappropriate cherry picking. While I think your justifications and validations of the reconstruction are good (though I look forward to reading the Neukom et al, in prep paper), there is very little with as much 'skeptic resonance' as withholding data (for whatever reason). If it is at all possible, I strongly urge you to put the whole thing online somewhere ASAP - don't do this to please McIntyre (an impossibility), but do it so that McIntyre et al are deprived of a talking point.

Please don't let yourself and your paper (and PAGES-2k indirectly) become another part of the litany of skeptic complaints about data - because once this gets going, it doesn't go away - regardless of the justification, subsequent vindication, integrity of the method, or robustness of the results. If people are going to criticise you (and they will), you are much, much better off fighting the battles on the statistical methods side than the data withholding side (for one thing, very few people understand or follow technical criticisms, while almost everyone understands criticisms about data access).

with regards,

Gavin

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Gavin Schmidt
NASA/Goddard Institute for Space Studies
2880 Broadway
New York, NY 10025
Tel: (212) 678 5627
Email: Gavin.A.Schmidt@nasa.gov
URL: http://www.giss.nasa.gov/staff/gschmidt.html

------ End of Forwarded Message

Climate Audit post

Joelle Gergis
Sent: 01 June 2012 15:47
To: David John Karoly; Raphael Neukom [redacted] Ailie Jane Eyre Gallant; s.phipps@unsw.edu.au

4

We should all be aware that this is unfolding:

http://climateaudit.org/2012/05/31/myles-allen-calls-for-name-and-shame/#more-16194

On 1/06/12 3:27 PM, "David Karoly" <dkaroly@unimelb.edu.au> wrote:

> Hi,
>
> Gavin is a good guy, with lots of experience dealing with M&M.
>
> I suggest that you forward to Gavin your recent email to McIntyre. I believe that you cannot release data which was provided to you for your own use and on the condition that it was not more widely released.
>
> Best wishes, David
>
> ~~~~~~
> **Prof David Karoly**
> School of Earth Sciences
> University of Melbourne, VIC 3010, AUSTRALIA
> ph: +61 3 8344 4698
> fax: +61 3 8344 7761
> email: dkaroly@unimelb.edu.au
> http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
> <http://www.earthsci.unimelb.edu.au/%7Edkaroly/wp/>
> ~~~~~~

From: Joelle Gergis
Sent: 01 June 2012 14:59
To: Raphael Neukom; David John Karoly
Subject: FW: unsolicited advice

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Date: Thu, 31 May 2012 23:53:23 -0500
To: Joelle Gergis <jgergis@unimelb.edu.au <UrlBlockedError.aspx> >
Subject: unsolicited advice

Joelle, (not sure that we've met, but we have been in at least indirect email contact, so I hope you don't mind the familiarity! Plus we are on the same committee now...)

This is just a quick note related to the data archiving for your J. Clim paper. As you are no doubt well aware, this has (unsurprisingly) got the attention of Steve McIntyre et al, and they have already started on their critiques.

While there is no chance whatsoever that they will examine your work and find no faults, the one area where you don't want to be seen to be at fault is on the area of data access. While the R27 proxies have been archived at NCDC, the wider data set from which these were picked has not. This leads you open to the charge of inappropriate cherry picking. While I think your justifications and validations of the reconstruction are good (though I look forward to reading the Neukom et al, in prep paper), there is very little with as much 'skeptic resonance' as withholding data (for whatever reason). If it is at all possible, I strongly urge you to put the whole thing online somewhere ASAP - don't do this to please McIntyre (an impossibility), but do it so that McIntyre et al are deprived of a talking point.

Please don't let yourself and your paper (and PAGES-2k indirectly) become another part of the litany of skeptic complaints about data - because once this gets going, it doesn't go away - regardless of the justification, subsequent vindication, integrity of the method, or robustness of the results. If people are going to criticise you (and they will), you are much, much better off fighting the battles on the statistical methods side than the data withholding side (for one thing, very few people understand or follow technical criticisms, while almost everyone understands criticisms about data access).

with regards,

Gavin

==========

Gavin Schmidt
NASA/Goddard Institute for Space Studies
2880 Broadway
New York, NY 10025
Tel: (212) 678 5627
Email: Gavin.A.Schmidt@nasa.gov <UrlBlockedError.aspx>
URL: http://www.giss.nasa.gov/staff/gschmidt.html

------ End of Forwarded Message

Climate audit post and paleo data

David John Karoly
Sent: 02 June 2012 07:26
To: Myles Allen [allen@atm.ox.ac.uk]

5

Hi Myles,

Steve M is using a post by you to criticise a recent study on which I am a coauthor.
http://climateaudit.org/2012/05/31/myles-allen-calls-for-name-and-shame/#more-16194
Please have a look at the post and let me know what you meant by the post of yours that Steven is referring to.
In particular, can you look at the response from Joelle Gergis and see if our approach to making the proxy data available meets your expectations for data availability.

All proxy data used in the reconstruction are available on the NOAA palaeoclimate web site. All of the proxy data that were screened to identify the records that showed the strongest relationship to interannual temperature variations in the region are described in an accompanying paper in The Holocene. The specific data sites, proxy series, publications describing those data and the sources of the data are listed in the Supp Material of the paper in the Holocene. Some of those screened records are not publicly available but were obtained from the scientists who originally obtained the data. They are still working on the data and have not made it publicly available on a web site yet, but they are willing to make it available to any researcher who requests it. All the data used in our reconstruction are publicly available.

Does your view express in the post on the M&M site indicate that you would not support the publication of our paper because some data that were not used in the reconstruction are not publicly available. That is what Steven M is arguing? This requirement would, if applied to model simulations, mean that all failed model runs, which were rejected due to errors or poor agreement with observational data, would need to be made publicly available before a paper could be published, even though those data were not used in the analysis, because such data were used in the development of the model? Is that what you mean?

It would be good to get a clearer understanding of your views and what you meant about journal publication policy and open data access.

By the way, we have compared the milleniium temp reconstruction for Australasia with climate model simulations to evaluate temp variability on decadal and multi-decadal time scales (but not multi-century timescales) in the paper.

Best wishes, David

~~~~~~
Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
~~~~~~

Fwd: Information Query

Rebecca Scott
Sent: 02 June 2012 08:22
To: David John Karoly; Joelle Gergis; Joshua Cockfield

6

Hi all,

Please see email I have received which needs your attention on Monday

Regards, Rebecca

Sent from my iPhone

Begin forwarded message:

> **From:** Mike Williams <mike@asecretcountry.com>
> **Date:** 2 June 2012 7:46:17 AM AEST
> **To:** "rebeccas@unimelb.edu.au" <rebeccas@unimelb.edu.au>
> **Subject: Information Query**
> **Reply-To:** Mike Williams <mike@asecretcountry.com>
>
> **Hi Rebecca.**
> **I found your email link on this page**
> **http://newsroom.melbourne.edu/studio/ep-149**
> **The article is talking about this paper here**
> **I am after the 35 "Climate Proxies" the authors did not use for their study.**
> **Could you forward them to me please.**
>
> **Thanks**
>
> **Mike Williams**

FW: Information Query

Joelle Gergis

Sent: 02 June 2012 10:18
To: mike@asecretcountry.com
Cc: Rebecca Scott; David John Karoly

Mr Williams

The majority of records used in our study are already available on the NOAA World Data Center for Palaeoclimatology.

For anything else, we have provided an extensive contact list of all data contributors in the supplementary section of our recent study 'Southern Hemisphere high-resolution palaeoclimate records of the last 2000 years' published in The Holocene (Table S3):

http://hol.sagepub.com/content/early/2011/12/16/0959683611427335

This list allows any researcher who wants to access non publically available records to follow the appropriate protocol of contacting the original authors to obtain the necessary permission to use the record, take the time needed to process the data into a format suitable for data analysis etc

Regards

Joelle

------ Forwarded Message
From: Rebecca Scott <rebeccas@unimelb.edu.au>
Date: Sat, 2 Jun 2012 08:22:29 +1000
To: David Karoly <dkaroly@unimelb.edu.au>, Joelle Gergis <jgergis@unimelb.edu.au>, Joshua Cockfield <jcoc@unimelb.edu.au>
Subject: Fwd: Information Query

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Please see email I have received which needs your attention on Monday

Regards, Rebecca

Sent from my iPhone

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> **From:** Mike Williams <mike@asecretcountry.com>
> **Date:** 2 June 2012 7:46:17 AM AEST
> **To:** "rebeccas@unimelb.edu.au" <rebeccas@unimelb.edu.au>
> **Subject: Information Query**

Reply-To: Mike Williams <mike@asecretcountry.com>

Hi Rebecca.
I found your email link on this page
http://newsroom.melbourne.edu/studio/ep-149
The article is talking about this paper here
<http://journals.ametsoc.org/doi/abs/10.1175/JCLI-D-11-00649.1>
I am after the 35 "Climate Proxies" the authors did not use for their study.
Could you forward them to me please.

Thanks

Mike Williams

------ End of Forwarded Message

Data Request

Mike Williams [mike@asecretcountry.com]
Sent: 02 June 2012 10:49
To: David John Karoly

Dr Karoly

I was told by Dr Gergis to contact you.
Could you please send me the unused 35 "Climate Proxies" from your paper listed below.

Thanks for you time

Mike Williams

http://journals.ametsoc.org/doi/abs/10.1175/JCLI-D-11-00649.1

RE: Data Request

9

David John Karoly
Sent: 02 June 2012 11:28
To: Mike Williams [mike@asecretcountry.com]
Cc: Joelle Gergis; Rebecca Scott

Dear Mr Williams,

Thank you for your interest in our study.
You should have already received a reply to your data request from Dr Gergis, the lead author on the paper. It describes exactly where and how you can access those data. It was sent at 10:19am this morning.

Best wishes, Data

~~~~~~
Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
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From: Mike Williams [mike@asecretcountry.com]
Sent: 02 June 2012 10:49
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Subject: Data Request

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Thanks for you time

Mike Williams

http://journals.ametsoc.org/doi/abs/10.1175/JCLI-D-11-00649.1

RE: Data Request

David John Karoly
Sent: 02 June 2012 11:51
To: Mike Williams [mike@asecretcountry.com]
Cc: Joelle Gergis

Dear Mr Williams,

I am one of the authors of the Gergis et al study, not one of the original authors of the studies referred to by Dr Gergis.

I think that you have misinterpreted the content of the email that you received from Dr Gergis. It said in the relevant part:

> "For anything else, we have provided an extensive contact list of all data contributors in the supplementary section of our recent study 'Southern Hemisphere high-resolution palaeoclimate records of the last 2000 years' published in The Holocene (Table S3):
>
> http://hol.sagepub.com/content/early/2011/12/16/0959683611427335
>
> This list allows any researcher who wants to access non publically available records to follow the appropriate protocol of contacting the original authors to obtain the necessary permission to use the record, take the time needed to process the data into a format suitable for data analysis etc"

You will need to access the list of the data contributors in Table S3 in the study referred to above, published recently in the journal "The Holocene", look for the data that is publicly available in the NOAA web site for the NOAA World Data Center for Palaeoclimatology, and then contact the original authors of the studies and data sets listed in Table S3, as we have done, for the other data sets.

All the data that were used in the reconstructions in our study that you found fascinating are available at the NOAA WDC for Palaeoclimatology at
http://www.ncdc.noaa.gov/paleo/recons.html

Best wishes, David

PS I am going to spend the rest of the weekend doing things other than replying to your emails.

~~~~~~
Prof David Karoly
School of Earth Sciences
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ph: +61 3 8344 4698
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From: Mike Williams [mike@asecretcountry.com]
Sent: 02 June 2012 11:36
To: David John Karoly
Subject: Re: Data Request

Dear Prof Karoly

Thank you for your interest in our study.

I find it fascinating.!

You should have already received a reply to your data request from Dr Gergis, the lead author on the paper. It describes exactly where and how you can access those data. It was sent at 10:19am this morning.

Yes I did thanks.

"...follow the appropriate protocol of contacting the original authors.."

I am contacting the original authors, you are one of them.
Could I have the data please.

Thanks

Mike Williams

Best wishes, Data

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Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
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Could you please send me the unused 35 "Climate Proxies" from your paper listed below.

Thanks for you time

Mike Williams

http://journals.ametsoc.org/doi/abs/10.1175/JCLI-D-11-00649.1

10

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∼∼∼

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School of Earth Sciences
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http://journals.ametsoc.org/doi/abs/10.1175/JCLI-D-11-00649.1

RE: Gergis et al 2012

David John Karoly
Sent: 02 June 2012 11:39
To: Anthony Broccoli [jcled@envsci.rutgers.edu]; amspubs@ametsoc.org
Cc: Raphael Neukom[redacted]; Joelle Gergis

Hi Tony,

Can you provide clear guidance on the data access and data archival policies for papers in AMS journals?
There is no clear guidance in the information for authors in the Authors' Guides section of the AMS Periodicals web site. Section 2 of the file listed under Ethical Guidelines for Authors etc states:
"2. A paper should contain sufficient detail and references to public sources of information (literature and data) and methodology used to permit the author's peers to test the paper's scientific conclusions."
Our manuscript does that.

Steve McIntyre is his email below says that he would like our paper to be retracted (or even rejected) because it does not meet his data access requirements.

What are the AMS data access requirements for publications in AMS journals?

Best wishes, David

~~~~~~
Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
~~~~~~

From: Joelle Gergis
Sent: 28 May 2012 11:39
To: Anthony Broccoli
Cc: Raphael Neukom; David John Karoly
Subject: Re: Gergis et al 2012

Hi Anthony

This is the first time Steven McIntyre has requested data used in our recently released Journal of Climate paper:

http://journals.ametsoc.org/doi/abs/10.1175/JCLI-D-11-00649.1

If he had the courtesy of asking us directly, we would have informed him that we have archived all records used in the analysis through the NOAA World Data Center for Palaeoclimatology:

http://www.ncdc.noaa.gov/paleo/recons.html

Given the paper was only released on 17 May, NOAA are still in the process of developing a feature page for the reconstruction, but here is the draft:

http://hurricane.ncdc.noaa.gov/pls/paleox/f?p=519:1:3345151224849419::::P1_STUDY_ID:12915

We are not in a position to pass on the entirety of our database as some records are not yet publically available. It has taken years to develop working relationships with individual researchers, some groups are still publishing their work, others have only released their data for a particular study and so on.

The compilation of this database represents years of our research effort based on the development of our professional networks. We risk damaging our working relationships by releasing other people's records against their wishes so is clearly something we are unprepared to do to satisfy the curiosity of a notorious climate change skeptic.

We did, however, provide an extensive contact list for all data contributors in the supplementary section of our recent study 'Southern Hemisphere high-resolution palaeoclimate records of the last 2000 years' published in The Holocene (Table S3):

http://hol.sagepub.com/content/early/2011/12/16/0959683611427335

This list allows any researcher who wants to access non publically available records to follow the appropriate process of contacting the original authors to obtain the necessary permission to use the record, take the time needed to process the data into a format suitable for data analysis and so on, just as we have done.

Please let me know if you need any further information.

All the best

Joelle

--
Dr Joelle Gergis
Climate Research Fellow
School of Earth Sciences
University of Melbourne,
VIC 3010, AUSTRALIA
Ph: +61 3 834 49868
Fax: +61 3 834 47761
http://climatehistory.com.au

On 28/05/12 5:09 AM, "Steve McIntyre" <smcintyre25@yahoo.ca> wrote:

> Dear Dr Broccoli,
> I am writing in respect to data for Gergis et al 2012, Evidence of unusual
> late 20th century warming from an Australasian temperature reconstruction
> spanning the last millennium, recently published in Journal of Climate.
>
> There has obviously been considerable adverse publicity about authors of

> paleoclimate temperature reconstructions using unarchived data and several
> committees have recommended that such practices end. This has occurred once
> again with Gergis et al 2012. Could you please ask the authors to archive the
> proxy data used n their reconstruction? And if they do not have permission
> from the originating authors to archive the data as used, would you please
> retract the article. Last year I made a similar request to co-author Neukom
> and was blown off. Hence the present request directly to you.
>
> The authors state that their regression calculations used a screened subset
> from a larger original data set. This larger pre-screened data should be the
> one that is made available.
>
> Thank you for your attention.
>
> Yours truly,
> Stephen McIntyre
>
>

ClimateAudit [SEC=UNCLASSIFIED]

Tas van Ommen [Tas.Van.ommen@aad.gov.au]

Sent: 02 June 2012 12:29
To: Raphael Neukom [redacted] Joelle Gergis
Cc: David John Karoly; Mark Curran [Mark.Curran@aad.gov.au]; Andrew Moy [Andrew.Moy@aad.gov.au]

12

UNCLASSIFIED

Hi Guys,

No news to you I'm sure that Steve M is on the Aus2k paper trail at the moment. I was alerted this morning when he wrote to me asking where the Law Dome d18O data was at and citing a 4 year old exchange we had....he didn't let on what was behind it.

Anyway, I've looked at the blog and made an initial neutral reply that didn't mention Gergis et al, in which I stated that public archives were up to date with what had been published for LD. I then immediately got back his request to have the data I provided for Gergis et al. for the purpose of his commentary.

I've taken the approach that if he really wants to check the screening correlation he can have the 1921-90 data, which I then provided in an email. This was particularly smooth to do, because that portion of the data is the same as the publicly archived Law Dome d18O that was used by Schneider and Steig 2006, and which he has access to.

I am not going to provide any of the rest of the LD data, as my attitude is that it needs first to be in a reviewed publication (which will in all likelihood be the SH reconstruction ... Raphi: I'm going to take a proper look at it this weekend).

Anyway, just so you know - Steve M can replicate the screening if he wants now (as far as LD is concerned). Providing just the 1921-90 period for correlation "checking" might be an alternative that could be considered for the other screened-out series. Mind you, simply quoting back the actual correlation values for the screened out series would also serve some purpose.

He can be a bit tricky in terms of playing one group against another, and not necessarily telling the whole story. If you have any questions around his approach, or this issue, please come back to me.

Best wishes,
Tas

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Re: Data Request

Mike Williams [mike@asecretcountry.com]
Sent: 02 June 2012 13:27
To: David John Karoly

13

Dr Karoly

Dear Mr Williams,

I am one of the authors of the Gergis et al study, not one of the original authors of the studies referred to by Dr Gergis.

I understand that perfectly.
But you dont seem to understand my simple request.
I am asking for the data you discarded from your paper.
Your name is on the paper that used the other studies.
Sending me to studies that you used for your paper has zero to do with my simple request from you.

and then contact the original authors of the studies and data sets listed in Table S3, as we have done, for the other data sets.

I contacted the original author(Gergis)..who also cited himself...(Gergis/Neukom 2011).

All the data that were used in the reconstructions in our study that you found fascinating are available at the NOAA WDC for Palaeoclimatology at
http://www.ncdc.noaa.gov/paleo/recons.html

"all"?...fascinating answer..I cannot find Neukon and Gergis 2011 there.
"...Our temperature proxy network was drawn from a broader Australasian domain (90E–140W, 10N–80S) containing 62 monthly–annually resolved climate proxies from approximately 50 sites (see details provided in Neukom and Gergis, 2011)...

PS I am going to spend the rest of the weekend doing things other than replying to your emails.

Fair enough.. :)
Looking forward to the data during the week.

all the best

Mike Williams

~~~~~~

Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
~~~~~~

http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
~~~~~~

From: Mike Williams [mike@asecretcountry.com]
Sent: 02 June 2012 11:36
To: David John Karoly
Subject: Re: Data Request

Dear Prof Karoly

Thank you for your interest in our study.

I find it fascinating.!

You should have already received a reply to your data request from Dr Gergis, the lead author on the paper. It describes exactly where and how you can access those data. It was sent at 10:19am this morning.

Yes I did thanks.

"...follow the appropriate protocol of contacting the original authors.."

I am contacting the original authors, you are one of them.
Could I have the data please.

Thanks

Mike Williams

Best wishes, Data

~~~~~~
Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
~~~~~~

From: Mike Williams [mike@asecretcountry.com]
Sent: 02 June 2012 10:49
~~~~~~

To: David John Karoly
Subject: Data Request

Dr Karoly

I was told by Dr Gergis to contact you.
Could you please send me the unused 35 "Climate Proxies" from your paper listed below.

Thanks for you time

Mike Williams

http://journals.ametsoc.org/doi/abs/10.1175/JCLI-D-11-00649.1

Re: Climate audit post and paleo data

Myles Allen [myles.allen@ouce.ox.ac.uk]
Sent: 02 June 2012 18:23
To: David John Karoly

14

Hi David,

What I said was that disclosure should be up to journal editors, not FoI lawyers. If the editor thinks that a dataset is relevant and a challenge is serious, then he or she should be in a position to require disclosure of the relevant data or code or demand a paper's retraction. Journals that consistently fail to do so can be named and shamed (but not banned — banning journals is always a bad idea). I'm not suggesting anything radical here: I think this is just a statement of the way things have been since the 17th century, and the way things work in most other branches of science.

I realise I shouldn't have put it the way I did in the post, and I'm sorry to have caused you unnecessary trouble.

Myles

From: David John Karoly <dkaroly@unimelb.edu.au>
Date: Friday, 1 June 2012 22:26
To: Myles Allen <allen@atm.ox.ac.uk>
Subject: Climate audit post and paleo data

Hi Myles,

Steve M is using a post by you to criticise a recent study on which I am a coauthor.
http://climateaudit.org/2012/05/31/myles-allen-calls-for-name-and-shame/#more-16194
Please have a look at the post and let me know what you meant by the post of yours that Steven is referring to. In particular, can you look at the response from Joelle Gergis and see if our approach to making the proxy data available meets your expectations for data availability.

All proxy data used in the reconstruction are available on the NOAA palaeoclimate web site. All of the proxy data that were screened to identify the records that showed the strongest relationship to interannual temperature variations in the region are described in an accompanying paper in The Holocene. The specific data sites, proxy series, publications describing those data and the sources of the data are listed in the Supp Material of the paper in the Holocene. Some of those screened records are not publicly available but were obtained from the scientists who originally obtained the data. They are still working on the data and have not made it publicly available on a web site yet, but they are willing to make it available to any researcher who requests it. All the data used in our reconstruction are publicly available.

Does your view express in the post on the M&M site indicate that you would not support the publication of our paper because some data that were not used in the reconstruction are not publicly available. That is what Steven M is arguing? This requirement would, if applied to model simulations, mean that all failed model runs, which were rejected due to errors or poor agreement with observational data, would need to be made publicly available before a paper could be published, even though those data were not used in the analysis, because such data were used in the development of the model? Is that what you mean?

It would be good to get a clearer understanding of your views and what you meant about journal publication policy and open data access.

By the way, we have compared the milleniium temp reconstruction for Australasia with climate model simulations to evaluate temp variability on decadal and multi-decadal time scales (but not multi-century timescales) in the paper.

Best wishes, David

~~~~~~
Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
~~~~~~

Responding to a Climate Audit data request

15

Joelle Gergis

Sent: 02 June 2012 19:04
To: Rosanne D'arrigo [rdd@ldeo.columbia.edu]; Kathryn Allen [kathryn.allen@monash.edu]; matthew.brookhouse@anu.edu.au; Brad Linsley [blinsley@ldeo.columbia.edu]; Tas van Ommen [Tas.Van.ommen@aad.gov.au]; Ian Goodwin [ian.goodwin@mq.edu.au]
Cc: Raphael Neukom [redacted]; David John Karoly; Ailie Jane Eyre Gallant; s.phipps@unsw.edu.au
Importance: High
Attachments: Neukom_and_Gergis_Holocene~1.pdf (3 MB) ; NOAA_PAGES 2k Data Availab~1.doc (24 KB)

Hi everyone

As you may know, recently we published a 1000 year temperature reconstruction for the Australasian region in the Journal of Climate:

http://journals.ametsoc.org/doi/abs/10.1175/JCLI-D-11-00649.1

After seeking permission from data contributors, all records used in the study are now archived with NOAA:

http://www.ncdc.noaa.gov/paleo/pubs/gergis2012/gergis2012.html

Thanks to Rosanne, Brad and Kathy for allowing us to make the data used in this study publically available.

Nonetheless, we have received a data request from notorious climate change sceptic Steve McIntyre to release the full Australasian database for discussion on his blog:

http://climateaudit.org/2012/05/31/myles-allen-calls-for-name-and-shame/#more-16194

My response was that we could not pass on some records without seeking permission, and encouraged him to contact researchers directly. Clearly he was not satisfied with my suggestion so has proceeded with threats of FOI, begun an online smear campaign etc

I have been advised by a US colleague (Gavin Schmidt) that the best way to proceed is to provide them with data to avoid inflaming this situation any further.

Tas Van Ommen has provided a very sensible solution to this request (see below). That is, to provide the 1921-1990 portion of the record used in the calibration process so that they can validate our screening procedure.

As mentioned in the attached paper published in The Holocene, we need to seek permission to use:

Tas van Ommen's Law Dome d18O, accumulation
Ian Goodwin's Law Dome Na
Brad Linsely's coral Tonga_TH1_d18O, Tonga_TNI2_d18O
Kathy Allen's CTP west
Rosanne's teak record, Northern Territory Callitris
Matthew Brookhouse's Baw Baw record

Can you please let me know if you are happy for the 1921-1990 portion of your record (listed above) to be released for this exercise?

If circumstances have recently changed and you are now happy for the full record to be release for inclusion on the NOAA PAGES 2K collection that is currently being compiled, please do let me know:

http://www.ncdc.noaa.gov/paleo/pages2k/pages-2k-network.html

(note that these web pages are still a work in progress, the global 2K network is aiming to have each region populated within the timeframe outlined in the attached Word document).

For tree ring records, please let us know if we can pass on raw ring width measurements or if you'd prefer just the processed version used in our study is only made available.

Brad, I know that it is unlikely that that you want to release your Tonga records as your student is still publishing her results. Matt, I am aware that you are still developing your snow gum chronology. It has been a while since we've caught up so it would be good to get an update.

I apologise for any headaches caused, but I hope you can appreciate that data access lies at the heart of their 'cherry picking' accusations. Clearly this is something we want to be very transparent on without jeopardising anyone's research effort.

Your timely response to this email would be greatly appreciated.

Thanks in advance for your help with this

Joelle

--
Dr Joelle Gergis
Climate Research Fellow
School of Earth Sciences
University of Melbourne,
VIC 3010, AUSTRALIA
Ph: +61 3 834 49868
Fax: +61 3 834 47761
http://climatehistory.com.au

------ Forwarded Message
From: Tas van Ommen <Tas.Van.ommen@aad.gov.au>
Date: Sat, 2 Jun 2012 12:29:47 +1000
To: Raphael Neukom [redacted] Joelle Gergis <jgergis@unimelb.edu.au>
Cc: David Karoly <dkaroly@unimelb.edu.au>, Mark Curran <Mark.Curran@aad.gov.au>, Andrew Moy <Andrew.Moy@aad.gov.au>
Subject: ClimateAudit [SEC=UNCLASSIFIED]

UNCLASSIFIED

Hi Guys,

No news to you I'm sure that Steve M is on the Aus2k paper trail at the moment. I was alerted this morning when he wrote to me asking where the Law Dome d18O data was at and citing a 4 year old exchange we had....he didn't let on what was behind it.

Anyway, I've looked at the blog and made an initial neutral reply that didn't mention Gergis et al, in which I stated that public archives were up to date with what had been published for LD. I then immediately got back his request to have the data I provided for Gergis et al. for the purpose of his commentary.

I've taken the approach that if he really wants to check the screening correlation he can have the 1921-90 data, which I then provided in an email. This was particularly smooth to do, because that portion of the data is the same as the publicly archived Law Dome d18O that was used by Schneider and Steig 2006, and which he has access to.

I am not going to provide any of the rest of the LD data, as my attitude is that it needs first to be in a reviewed publication (which will in all likelihood be the SH reconstruction ... Raphi: I'm going to take a proper look at it this weekend).

Anyway, just so you know - Steve M can replicate the screening if he wants now (as far as LD is concerned). Providing just the 1921-90 period for correlation "checking" might be an alternative that could be considered for the other screened-out series. Mind you, simply quoting back the actual correlation values for the screened out series would also serve some purpose.

He can be a bit tricky in terms of playing one group against another, and not necessarily telling the whole story. If you have any questions around his approach, or this issue, please come back to me.

Best wishes,
Tas

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------ End of Forwarded Message

Re: Responding to a Climate Audit data request [SEC=UNCLASSIFIED]

16

Tas van Ommen [Tas.Van.ommen@aad.gov.au]

Sent: 02 June 2012 19:43
To: Joelle Gergis
Cc: Rosanne D'arrigo [rdd@ldeo.columbia.edu]; Kathryn Allen [kathryn.allen@monash.edu]; matthew.brookhouse@anu.edu.au; Brad Linsley [blinsley@ldeo.columbia.edu]; Ian Goodwin [ian.goodwin@mq.edu.au]; Raphael Neukom [redacted] David John Karoly; Ailie Jane Eyre Gallant; s.phipps@unsw.edu.au; Andrew Moy [Andrew.Moy@aad.gov.au]; Mark Curran [Mark.Curran@aad.gov.au]

Hi All,

To be clear - the only data used in the screening for rejected series is 1921-1990.

Ironically, in the Law Dome d18O case, this time slice is already archived from some years back (1800-2000AD), and I've already passed a copy to McIntyre today.

Data outside this time window have had no involvement in the Aus2k reconstruction and for LD, I want to have this data subject to peer review before public release. This is imminent anyway.

I believe this is a sensible approach and hard to criticize (surely review of data sets prior to release makes sense). If common sense appears not to be defensible then I will reconsider, but I think this is a reasonable position.

For LD sodium, a 700 year series is already publicly archived with The Australian Antarctic Data Centre. It is probably identical to the series Ian Goodwin provided. In recent times there have been a few tiny dating improvements, but none I know of in the calibration/screening period. I would support release of the 1921-90 sodium data, with a note to point out that a longer series is archived at AADC, BUT Mark Curran and Ian Goodwin should be the final advisors on this.

Regards,

Tas

Sent from mobile

On 02/06/2012, at 19:08, "Joelle Gergis" <jgergis@unimelb.edu.au> wrote:

> Hi everyone
>
> As you may know, recently we published a 1000 year temperature reconstruction for the Australasian region in the Journal of Climate:
>
> http://journals.ametsoc.org/doi/abs/10.1175/JCLI-D-11-00649.1
>
> After seeking permission from data contributors, all records used in the study are now archived with NOAA:
>
> http://www.ncdc.noaa.gov/paleo/pubs/gergis2012/gergis2012.html
>
> Thanks to Rosanne, Brad and Kathy for allowing us to make the data used in this study publically available.
>
> Nonetheless, we have received a data request from notorious climate change sceptic Steve McIntyre to release the full Australasian database for discussion on his blog:
>

> http://climateaudit.org/2012/05/31/myles-allen-calls-for-name-and-shame/#more-16194
>
> My response was that we could not pass on some records without seeking permission, and encouraged him to contact researchers directly. Clearly he was not satisfied with my suggestion so has proceeded with threats of FOI, begun an online smear campaign etc
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> I have been advised by a US colleague (Gavin Schmidt) that the best way to proceed is to provide them with data to avoid inflaming this situation any further.
>
> Tas Van Ommen has provided a very sensible solution to this request (see below). That is, to provide the 1921-1990 portion of the record used in the calibration process so that they can validate our screening procedure.
>
> As mentioned in the attached paper published in The Holocene, we need to seek permission to use:
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> Kathy Allen's CTP west
> Rosanne's teak record, Northern Territory Callitris
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> Can you please let me know if you are happy for the 1921-1990 portion of your record (listed above) to be released for this exercise?
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> If circumstances have recently changed and you are now happy for the full record to be release for inclusion on the NOAA PAGES 2K collection that is currently being compiled, please do let me know:
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> http://www.ncdc.noaa.gov/paleo/pages2k/pages-2k-network.html
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> (note that these web pages are still a work in progress, the global 2K network is aiming to have each region populated within the timeframe outlined in the attached Word document).
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>
> Your timely response to this email would be greatly appreciated.
>
> Thanks in advance for your help with this
>
> Joelle
>
> --
> Dr Joelle Gergis
> Climate Research Fellow
> School of Earth Sciences

> University of Melbourne,
> VIC 3010, AUSTRALIA
> Ph: +61 3 834 49868
> Fax: +61 3 834 47761
> http://climatehistory.com.au
>
>
>
> ------ Forwarded Message
> From: Tas van Ommen <Tas.Van.ommen@aad.gov.au>
> Date: Sat, 2 Jun 2012 12:29:47 +1000
> To: Raphael Neukom [redacted], Joelle Gergis <jgergis@unimelb.edu.au>
> Cc: David Karoly <dkaroly@unimelb.edu.au>, Mark Curran <Mark.Curran@aad.gov.au>, Andrew Moy <Andrew.Moy@aad.gov.au>
> Subject: ClimateAudit [SEC=UNCLASSIFIED]
>
> UNCLASSIFIED
>
> Hi Guys,
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> Best wishes,
> Tas
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> _____
>
>
> ------ End of Forwarded Message
> <Neukom_and_Gergis_Holocene_2012.pdf>
> <NOAA_PAGES 2k Data Availability for Reviewers of 2k T Consortium Paper.doc>

_____

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_____

FW: Climate audit post and paleo data

17

David John Karoly
Sent: 03 June 2012 08:00
To: Joelle Gergis; Raphael Neukom [redacted]

Hi Joelle and Raphi,

I sent an email to Myles Allen seeking clarification on what he meant by his "name and shame" comments that are being used by Steve McIntyre. Response is below. He is saying that the journals data policy and the decisions by the editor should determine the specific data access and archive policies for all papers submitted to that journal, not requests from individuals.

I hope this clarifies what Myles meant and how it is being misused by McIntyre.

Best wishes, David

~~~~~~
Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
~~~~~~

From: Myles Allen [myles.allen@ouce.ox.ac.uk]
Sent: 02 June 2012 18:23
To: David John Karoly
Subject: Re: Climate audit post and paleo data

Hi David,

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I realise I shouldn't have put it the way I did in the post, and I'm sorry to have caused you unnecessary trouble.

Myles

From: David John Karoly <dkaroly@unimelb.edu.au>
Date: Friday, 1 June 2012 22:26
To: Myles Allen <allen@atm.ox.ac.uk>
Subject: Climate audit post and paleo data

Hi Myles,

Steve M is using a post by you to criticise a recent study on which I am a coauthor.
http://climateaudit.org/2012/05/31/myles-allen-calls-for-name-and-shame/#more-16194
Please have a look at the post and let me know what you meant by the post of yours that Steven is referring to. In particular, can you look at the response from Joelle Gergis and see if our approach to making the proxy data available meets your expectations for data availability.

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Does your view express in the post on the M&M site indicate that you would not support the publication of our paper because some data that were not used in the reconstruction are not publicly available. That is what Steven M is arguing? This requirement would, if applied to model simulations, mean that all failed model runs, which were rejected due to errors or poor agreement with observational data, would need to be made publicly available before a paper could be published, even though those data were not used in the analysis, because such data were used in the development of the model? Is that what you mean?

It would be good to get a clearer understanding of your views and what you meant about journal publication policy and open data access.

By the way, we have compared the milleniium temp reconstruction for Australasia with climate model simulations to evaluate temp variability on decadal and multi-decadal time scales (but not multi-century timescales) in the paper.

Best wishes, David

~~~~~~
Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
~~~~~~

18

Re: Responding to a Climate Audit data request

Kathryn Allen [kathryn.allen@monash.edu]

Sent: 03 June 2012 11:36
To: Joelle Gergis
Cc: Rosanne D'arrigo [rdd@ldeo.columbia.edu]; matthew.brookhouse@anu.edu.au; Brad Linsley [blinsley@ldeo.columbia.edu]; Tas van Ommen [Tas.Van.ommen@aad.gov.au]; Ian Goodwin [ian.goodwin@mq.edu.au]; Raphael Neukom [redacted] David John Karoly; Ailie Jane Eyre Gallant; s.phipps@unsw.edu.au

Hi Joelle et al.,

More than happy for you to send the west coast CTP 1921 - 1990 as Tas suggested. i think it would probably be clearer, and force greater transparency on McIntyre's behalf (and better comparison with the original reconstruction), to send on the processed version of the record for this time period.

Cheers,
Kathy

On 02/06/2012, Joelle Gergis <jgergis@unimelb.edu.au> wrote:
> Hi everyone
>
> As you may know, recently we published a 1000 year temperature
> reconstruction for the Australasian region in the Journal of Climate:
>
> http://journals.ametsoc.org/doi/abs/10.1175/JCLI-D-11-00649.1
>
> After seeking permission from data contributors, all records used in the
> study are now archived with NOAA:
>
> http://www.ncdc.noaa.gov/paleo/pubs/gergis2012/gergis2012.html
>
> Thanks to Rosanne, Brad and Kathy for allowing us to make the data used in
> this study publically available.
>
> Nonetheless, we have received a data request from notorious climate change
> sceptic Steve McIntyre to release the full Australasian database for
> discussion on his blog:
>
> http://climateaudit.org/2012/05/31/myles-allen-calls-for-name-and-shame/#more-16194
>
> My response was that we could not pass on some records without seeking
> permission, and encouraged him to contact researchers directly. Clearly he
> was not satisfied with my suggestion so has proceeded with threats of FOI,
> begun an online smear campaign etc
>
> I have been advised by a US colleague (Gavin Schmidt) that the best way to
> proceed is to provide them with data to avoid inflaming this situation any
> further.
>
> Tas Van Ommen has provided a very sensible solution to this request (see
> below). That is, to provide the 1921-1990 portion of the record used in the
> calibration process so that they can validate our screening procedure.
>
> As mentioned in the attached paper published in The Holocene, we need to
> seek permission to use:
>
> Tas van Ommen's Law Dome d18O, accumulation
> Ian Goodwin's Law Dome Na

> Brad Linsely's coral Tonga_TH1_d18O, Tonga_TNI2_d18O
> Kathy Allen's CTP west
> Rosanne's teak record, Northern Territory Callitris
> Matthew Brookhouse's Baw Baw record
>
> Can you please let me know if you are happy for the 1921-1990 portion of
> your record (listed above) to be released for this exercise?
>
> If circumstances have recently changed and you are now happy for the full
> record to be release for inclusion on the NOAA PAGES 2K collection that is
> currently being compiled, please do let me know:
>
> http://www.ncdc.noaa.gov/paleo/pages2k/pages-2k-network.html
>
> (note that these web pages are still a work in progress, the global 2K
> network is aiming to have each region populated within the timeframe
> outlined in the attached Word document).
>
> For tree ring records, please let us know if we can pass on raw ring width
> measurements or if you'd prefer just the processed version used in our study
> is only made available.
>
> Brad, I know that it is unlikely that that you want to release your Tonga
> records as your student is still publishing her results. Matt, I am aware
> that you are still developing your snow gum chronology. It has been a while
> since we've caught up so it would be good to get an update.
>
> I apologise for any headaches caused, but I hope you can appreciate that
> data access lies at the heart of their 'cherry picking' accusations. Clearly
> this is something we want to be very transparent on without jeopardising
> anyone's research effort.
>
> Your timely response to this email would be greatly appreciated.
>
> Thanks in advance for your help with this
>
> Joelle
>
> --
> Dr Joelle Gergis
> Climate Research Fellow
> School of Earth Sciences
> University of Melbourne,
> VIC 3010, AUSTRALIA
> Ph: +61 3 834 49868
> Fax: +61 3 834 47761
> http://climatehistory.com.au
>
>
>
> ------ Forwarded Message
> From: Tas van Ommen <Tas.Van.ommen@aad.gov.au>
> Date: Sat, 2 Jun 2012 12:29:47 +1000
> To: Raphael Neukom [redacted] Joelle Gergis
> <jgergis@unimelb.edu.au>
> Cc: David Karoly <dkaroly@unimelb.edu.au>, Mark Curran
> <Mark.Curran@aad.gov.au>, Andrew Moy <Andrew.Moy@aad.gov.au>
> Subject: ClimateAudit [SEC=UNCLASSIFIED]
>
> UNCLASSIFIED
>

> Hi Guys,
>
> No news to you I'm sure that Steve M is on the Aus2k paper trail at the
> moment. I was alerted this morning when he wrote to me asking where the Law
> Dome d18O data was at and citing a 4 year old exchange we had....he didn't
> let on what was behind it.
>
> Anyway, I've looked at the blog and made an initial neutral reply that
> didn't mention Gergis et al, in which I stated that public archives were up
> to date with what had been published for LD. I then immediately got back his
> request to have the data I provided for Gergis et al. for the purpose of his
> commentary.
>
> I've taken the approach that if he really wants to check the screening
> correlation he can have the 1921-90 data, which I then provided in an email.
> This was particularly smooth to do, because that portion of the data is the
> same as the publicly archived Law Dome d18O that was used by Schneider and
> Steig 2006, and which he has access to.
>
> I am not going to provide any of the rest of the LD data, as my attitude is
> that it needs first to be in a reviewed publication (which will in all
> likelihood be the SH reconstruction ... Raphi: I'm going to take a proper
> look at it this weekend).
>
> Anyway, just so you know - Steve M can replicate the screening if he wants
> now (as far as LD is concerned). Providing just the 1921-90 period for
> correlation "checking" might be an alternative that could be considered for
> the other screened-out series. Mind you, simply quoting back the actual
> correlation values for the screened out series would also serve some
> purpose.
>
> He can be a bit tricky in terms of playing one group against another, and
> not necessarily telling the whole story. If you have any questions around
> his approach, or this issue, please come back to me.
>
> Best wishes,
> Tas
> _____
>
> Australian Antarctic Division - Commonwealth of Australia
> IMPORTANT: This transmission is intended for the addressee only. If you are
> not the
> intended recipient, you are notified that use or dissemination of this
> communication is
> strictly prohibited by Commonwealth law. If you have received this
> transmission in error,
> please notify the sender immediately by e-mail or by telephoning +61 3 6232
> 3209 and
> DELETE the message.
> Visit our web site at http://www.antarctica.gov.au/
> _____
>
>
> ------ End of Forwarded Message
>

19

Fwd: Disclosure required

Joelle Gergis
Sent: 03 June 2012 15:17
To: David John Karoly; Raphael Neukom [redacted]

Sent from my iPhone

Begin forwarded message:

From: Caroline Webb <lifewebb@gmail.com>
Date: 3 June 2012 1:58:53 PM AEST
To: <jgergis@unimelb.edu.au>
Subject: Disclosure required

Dear Joelle Gergis,

I am following the story of climate scientists' practices with respect to their provision of data, both used and rejected for use, as it unfolds over at www.climateaudit.org (http://climateaudit.org/2012/05/31/myles-allen-calls-for-name-and-shame/#more-16194)

I am just an ordinary person interested to know if climate science is trustworthy or has issues with its selectivity and possible bias. It does seem to me that your answer to Steve McIntyre sent on May 31 is not acceptable because instead of you realizing that it is your job to get permission from people for their data sets to be made publicly available, you instead deem it the work of the concerned public to go running around scientists asking them to deliver the data that you did not elect to use in your work. McIntyre says that you chose not to archive the 35 proxies that you did not use. One immediately wants to know why not. Even a very ordinary person can wonder about this point. It is not acceptable to blow him off, or blow the rest of us off who are watching what climate scientists are doing.

Until all journal editors understand that complete archiving of datasets, used to fathom trends or discarded for unknown reasons, the public faces the possibility that the wool is being pulled over their eyes. It is only in the interests of the science and the people doing that science, that they display the entire basket of data and provide full explanations about why certain data was not included for analysis.

Why is this point proving so extremely arduous to achieve? It is all going to backfire on you. Instead of being haughty with Mr McIntyre, I suggest you pull your finger out and get some action towards answering his questions. You know your network. Get them produce the information requested please.

Sincerely,

Caroline Webb

20

Re: Gergis et al 2012

JCLI Chief Editor [jcled@envsci.rutgers.edu]
Sent: 04 June 2012 04:53
To: David John Karoly
Cc: amspubs@ametsoc.org; Raphael Neukom [redacted] Joelle Gergis

Hi David,

Section 2 of the Ethical Guidelines for Authors is the only guidance from AMS that I am aware of regarding data access and data archival.

Regards.
Tony

On 6/1/2012 9:39 PM, David John Karoly wrote:

> Hi Tony,
>
> Can you provide clear guidance on the data access and data archival policies for papers in AMS journals?
> There is no clear guidance in the information for authors in the Authors' Guides section of the AMS Periodicals web site. Section 2 of the file listed under Ethical Guidelines for Authors etc states:
> "2. A paper should contain sufficient detail and references to public sources of information (literature and data) and methodology used to permit the author's peers to test the paper's scientific conclusions."
> Our manuscript does that.
>
> Steve McIntyre is his email below says that he would like our paper to be retracted (or even rejected) because it does not meet his data access requirements.
>
> What are the AMS data access requirements for publications in AMS journals?
>
> Best wishes, David
>
> ~~~~~~
> **Prof David Karoly**
> School of Earth Sciences
> University of Melbourne, VIC 3010, AUSTRALIA
> ph: +61 3 8344 4698
> fax: +61 3 8344 7761
> email: dkaroly@unimelb.edu.au
> http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
> ~~~~~~

From: Joelle Gergis
Sent: 28 May 2012 11:39
To: Anthony Broccoli
Cc: Raphael Neukom; David John Karoly
Subject: Re: Gergis et al 2012

Hi Anthony

This is the first time Steven McIntyre has requested data used in our recently released Journal of

Climate paper:

http://journals.ametsoc.org/doi/abs/10.1175/JCLI-D-11-00649.1

If he had the courtesy of asking us directly, we would have informed him that we have archived all records used in the analysis through the NOAA World Data Center for Palaeoclimatology:

http://www.ncdc.noaa.gov/paleo/recons.html

Given the paper was only released on 17 May, NOAA are still in the process of developing a feature page for the reconstruction, but here is the draft:

http://hurricane.ncdc.noaa.gov/pls/paleox/f?p=519:1:3345151224849419::::P1_STUDY_ID:12915

We are not in a position to pass on the entirety of our database as some records are not yet publically available. It has taken years to develop working relationships with individual researchers, some groups are still publishing their work, others have only released their data for a particular study and so on.

The compilation of this database represents years of our research effort based on the development of our professional networks. We risk damaging our working relationships by releasing other people's records against their wishes so is clearly something we are unprepared to do to satisfy the curiosity of a notorious climate change skeptic.

We did, however, provide an extensive contact list for all data contributors in the supplementary section of our recent study 'Southern Hemisphere high-resolution palaeoclimate records of the last 2000 years' published in The Holocene (Table S3):

http://hol.sagepub.com/content/early/2011/12/16/0959683611427335

This list allows any researcher who wants to access non publically available records to follow the appropriate process of contacting the original authors to obtain the necessary permission to use the record, take the time needed to process the data into a format suitable for data analysis and so on, just as we have done.

Please let me know if you need any further information.

All the best

Joelle

--

Dr Joelle Gergis
Climate Research Fellow
School of Earth Sciences
University of Melbourne,
VIC 3010, AUSTRALIA
Ph: +61 3 834 49868

Fax: +61 3 834 47761
http://climatehistory.com.au

On 28/05/12 5:09 AM, "Steve McIntyre" <smcintyre25@yahoo.ca> wrote:

> Dear Dr Broccoli,
> I am writing in respect to data for Gergis et al 2012, Evidence of unusual
> late 20th century warming from an Australasian temperature reconstruction
> spanning the last millennium, recently published in Journal of Climate.
>
> There has obviously been considerable adverse publicity about authors of
> paleoclimate temperature reconstructions using unarchived data and several
> committees have recommended that such practices end. This has occurred once
> again with Gergis et al 2012. Could you please ask the authors to archive the
> proxy data used n their reconstruction? And if they do not have permission
> from the originating authors to archive the data as used, would you please
> retract the article. Last year I made a similar request to co-author Neukom
> and was blown off. Hence the present request directly to you.
>
> The authors state that their regression calculations used a screened subset
> from a larger original data set. This larger pre-screened data should be the
> one that is made available.
>
> Thank you for your attention.
>
> Yours truly,
> Stephen McIntyre
>
>

21

Fwd: Paleo Australia

Joelle Gergis
Sent:05 June 2012 08:09
To: David John Karoly; Raphael Neukom[redacted]

Sent from my iPhone

Begin forwarded message:

From: "Anonymous Remailer (austria)"[redacted]
Date: 5 June 2012 2:10:33 AM AEST
To: <jgergis@unimelb.edu.au>
Subject: Paleo Australia

read: your paper is being slaughtered
do something! engage!

http://climateaudit.org/2012/06/03/gergis-two-medieval-proxies/
http://climateaudit.org/2012/05/31/myles-allen-calls-for-name-and-shame/

22

Fwd: new paper

Joelle Gergis
Sent: 05 June 2012 08:11
To: David John Karoly

Sent from my iPhone

Begin forwarded message:

From: [redacted]
Date: 4 June 2012 7:15:04 PM AEST
To: Joelle Gergis <jgergis@unimelb.edu.au>
Subject: Re: new paper

Dear Joelle,
just in case you missed Steve McIntyre has a post up regarding part of your published paper. Perhaps you can respond?

http://climateaudit.org/2012/06/03/gergis-two-medieval-proxies/

Regards
Marc

On Fri, May 18, 2012 at 4:46 PM, Joelle Gergis <jgergis@unimelb.edu.au> wrote:

> H[redacted]
>
> Thanks for your interest in our study.
>
> On a closer read of the paper you will see that our statistical method for proxy selection is detailed in section 2.2. We only used records that showed a statistically significant relationship with the combined land and ocean temperature predictand for the broad Australasian region (note that both records were detrended prior to analysis to avoid inflation correlations due to recent global warming trends).
>
> Observed Australasian temperatures display large spatial coherence as discussed in section 3.1 and shown in Figure S1. To further look at this we used instrumental observations taken from the proxy locations (see section S3) and this showed that it is indeed feasible to reconstruct a spatial mean of our target predictand using a relatively sparse network.
>
> Yes, all data used in the study will be lodged with NOAA. The PAGES 2K network is currently having monthly meetings to ensure that records used in the global study will be accessible by the project's completion.
>
> All the best

Joelle

--
Dr Joelle Gergis
Climate Research Fellow
School of Earth Sciences
University of Melbourne,
VIC 3010, AUSTRALIA
Ph: +61 3 834 49868
Fax: +61 3 834 47761
http://climatehistory.com.au

On 17/05/12 5:00 PM, [redacted] wrote:

> Dr Gergis,
> Thanks again for that link. On a quick look I note a rather odd
> geographic spread of proxies dominated by NZ Trees. Interestingly
> there do not appear to be any proxies from the Australian mainland
> (Tas and Off shore WA). Assume you had access to the GBR corals and
> that there is a detailed explanation in your paper for their absence,
> and for the inclusion of the hand picked group of 27 proxies you have
> chosen. It does look rather Hockey Stick like! I hope you are prepared
> for a forthright debate.
>
> All in all it should make for an interesting read. Congrats on getting
> it published. Is the original data logged with the NOAA
> Paleoclimatology Program?
>
> cheers
> [redacted]
>
> PS I have forwarded that link on to Steve McIntyre, whi I am sure will
> take an interest in your method and conclusions.
>
> On Thu, May 17, 2012 at 2:37 PM, Joelle Gergis <jgergis@unimelb.edu.au> wrote:
>> HI [redacted]
>>
>> Yes of course it is accessible here:
>>
>> http://www.smc.org.au/2012/05/news-briefing-1000-years-of-climate-data-confir
>> ms-australias-warming/
>>
>> Please note it is still subject to typesetting and final proofing.
>>
>> All the best
>>
>> Joelle
>>

>> --
>> Dr Joelle Gergis
>> Climate Research Fellow
>> School of Earth Sciences
>> University of Melbourne,
>> VIC 3010, AUSTRALIA
>> Ph: +61 3 834 49868
>> Fax: +61 3 834 47761
>> http://climatehistory.com.au
>>
>>
>>
>>
>> On 17/05/12 2:31 PM, [redacted] wrote:
>>
>>> Dear Dr Gergis,
>>> I would be interested in reading your new paper "Evidence of unusual
>>> late 20th century warming from an Australasian temperature
>>> reconstruction spanning the last millennium" Journal of Climate 2012;
>>> e-View doi: http://dx.doi.org/10.1175/JCLI-D-11-00649.1
>>>
>>> I don't suppose you could provide a link or a pdf copy of the full paper.
>>>
>>> Regards
>>> [redacted]
>>>
>

23

Mistake in the Australasian TT paper

Raphael Neukom [neukom@giub.unibe.ch]

Sent: 06 June 2012 09:46
To: Joelle Gergis; David John Karoly

Hi Joelle and David,

As just discussed with joelle on skype, I found a mistake in our paper in journal of climate today.

It is related to the proxy screening, so it is a delicate issue. In the paper we write that we do the correlation analysis for the screening based on detrended (instrumental and proxy) data, but in reality we did not use detrended data.

The origin of the mistake is that at the stage when we were writing the paper my approaches have already evolved and I had made the proxy selection for the SH reconstruction based on detrended data. I therefore had in my mind that we had done the same for Australasia months ago and was very negligent not to check this carefully.

Using detrended data would only select very few proxy records that would not allow a reasonable reconstruction. I think it is basically justifiable to do the screening without detrending but changing these words may cause troubles.

Fortunately we have not received the proofs yet. So my suggestion is to write to the editor, explain the mistake and ask for permission to correct the error, if necessary via sending it out to review again.

I apologize for the mistake and the troubles it may cause and hope that we can find a good way to correct it.

David your advice on this would be very much appreciated

Thanks a lot and best regards
Raphi

24

RE: Mistake in the Australasian TT paper

David John Karoly
Sent:06 June 2012 09:58
To: Raphael Neukom [neukom@giub.unibe.ch]; Joelle Gergis

Oops, let me think about this a little and then get back to you. We will need to have a skype call, agree on what to do in terms of analysis, probably new analysis, and then how to minimise the damage.

There is one good point: the results and the paper can be improved through this correction.

Best wishes, David

Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/

From: Raphael Neukom [neukom@giub.unibe.ch]
Sent: 06 June 2012 09:46
To: Joelle Gergis; David John Karoly
Subject: Mistake in the Australasian TT paper

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The origin of the mistake is that at the stage when we were writing the paper my approaches have already evolved and I had made the proxy selection for the SH reconstruction based on detrended data. I therefore had in my mind that we had done the same for Australasia months ago and was very negligent not to check this carefully.

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David your advice on this would be very much appreciated

Thanks a lot and best regards
Raphi

25

RE: Mistake in the Australasian TT paper

David John Karoly
Sent: 06 June 2012 10:03
To: Raphael Neukom [neukom@giub.unibe.ch]; Joelle Gergis

PS Are you absolutely sure that you used detrended data for the SH reconstruction? What is the range of correlations for the interannual variability of detrended SH average temp between the observations and the ensemble of reconstructions (95% confid int) for the calibration period?

What is the range of correlations for the decadal variability of detrended SH average temp between the observations and the ensemble of reconstructions (95% confid int) for the calibration period?

Thanks, David

~~~~~~
Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
~~~~~~

From: Raphael Neukom [neukom@giub.unibe.ch]
Sent: 06 June 2012 09:46
To: Joelle Gergis; David John Karoly
Subject: Mistake in the Australasian TT paper

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I apologize for the mistake and the troubles it may cause and hope that we can find a good way to correct it.

David your advice on this would be very much appreciated

Thanks a lot and best regards
Raphi

Re: Mistake in the Australasian TT paper

26

Joelle Gergis
Sent: 06 June 2012 11:12
To: David John Karoly; Raphael Neukom [neukom@giub.unibe.ch]

Hi David

We should discuss this via a 3-person Skype call this afternoon (morning in Zurich) if possible.

Raphi got to bed at 2am going through all of this so I'm not sure if he will be up and at work at his usual time of 3:30-4pm Melbourne time.

Can you please provide a range of times that suits this afternoon/evening?

Thanks

Joelle

On 6/06/12 9:58 AM, "David Karoly" <dkaroly@unimelb.edu.au> wrote:

> Oops, let me think about this a little and then get back to you. We will need
> to have a skype call, agree on what to do in terms of analysis, probably new
> analysis, and then how to minimise the damage.
>
> There is one good point: the results and the paper can be improved through
> this correction.
>
> Best wishes, David
>
> ~~~~~~
> Prof David Karoly
> School of Earth Sciences
> University of Melbourne, VIC 3010, AUSTRALIA
> ph: +61 3 8344 4698
> fax: +61 3 8344 7761
> email: dkaroly@unimelb.edu.au
> http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
> ~~~~~~
>
> _____
> From: Raphael Neukom [neukom@giub.unibe.ch]
> Sent: 06 June 2012 09:46
> To: Joelle Gergis; David John Karoly
> Subject: Mistake in the Australasian TT paper
>
> Hi Joelle and David,
>

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>
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> paper we write that we do the correlation analysis for the screening
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> not use detrended data.
>
> The origin of the mistake is that at the stage when we were writing the
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> selection for the SH reconstruction based on detrended data. I therefore
> had in my mind that we had done the same for Australasia months ago and
> was very negligent not to check this carefully.
>
> Using detrended data would only select very few proxy records that would
> not allow a reasonable reconstruction. I think it is basically
> justifiable to do the screening without detrending but changing these
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> write to the editor, explain the mistake and ask for permission to
> correct the error, if necessary via sending it out to review again.
>
> I apologize for the mistake and the troubles it may cause and hope that
> we can find a good way to correct it.
>
> David your advice on this would be very much appreciated
>
> Thanks a lot and best regards
> Raphi
>
>
>

Re: Mistake in the Australasian TT paper

27

Raphael Neukom [neukom@giub.unibe.ch]

Sent: 07 June 2012 05:56
To: David John Karoly
Cc: Joelle Gergis
Attachments: Correlations_recon_target_~1.pdf (32 KB)

Hi David,

I used detrended data for the screening procedure in the SH recon. I just ran it again using non detrended data. The number of selected proxiesincreased from 111 to 134.
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RE: Mistake in the Australasian TT paper

28

David John Karoly
Sent: 07 June 2012 06:48
To: Raphael Neukom [neukom@giub.unibe.ch]
Cc: Joelle Gergis

Hi Raphi,

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From: Raphael Neukom [neukom@giub.unibe.ch]
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Sent: 07 June 2012 08:55
To: David John Karoly
Cc: Joelle Gergis
Attachments: recon_vs_noise-recon_vs_in~1.png (34 KB) ; RE_recon_vs_noise-recon.png (17 KB)

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I can also run a reconstruction using the proxies that were excluded. This reconstruction will most probably also show a hockey stick, but again bad skill. This will show that the hockey stick does not depend on the proxy screening. I think if you calibrate with non detrended data (as we always do) you will always get a hockey stick with predictors that have such a high autocorrelation as proxies typically do (average of 0.37 over all proxies, 0.42 over the selected ones in our case).

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RE: Mistake in the Australasian TT paper

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Re: Mistake in the Australasian TT paper

31

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Sent: 08 June 2012 07:26
To: David John Karoly
Cc: Raphael Neukom [neukom@giub.unibe.ch]

Thanks for letting us know David.

I will write an email to the journal editor today. Perhaps I could run the draft past you first...

On 08/06/2012, at 6:47 AM, "David John Karoly" <dkaroly@unimelb.edu.au> wrote:

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>> To: David John Karoly
>> Cc: Joelle Gergis
>> Subject: Re: Mistake in the Australasian TT paper
>>
>> Hi David,
>>
>> I used detrended data for the screening procedure in the SH recon. I
>> just ran it again using non detrended data. The number of selected
>> proxiesincreased from 111 to 134.
>> I am now running a new reconstruction over night using these 134 records
>> to see how the results compare.
>>
>> Attached a table showing the correlations of the instrumental target
>> with the reconstructions for the 1911-1990 overlap period, which
>> includes calibration and verification years for each ensemble member
>> (interannual, decadal, detrended and non-detrended). The included plot
>> shows these correlations for the ensemble mean selecting verification
>> (red, dashed) and calibration (black solid) years only and also back in
>> time for the individual proxy nests.
>>
>> I am looking forward to talk to you tomorrow
>> Thanks
>> Raphi
>>
>>
>> Am 06.06.2012 02:03, schrieb David John Karoly:
>>> PS Are you absolutely sure that you used detrended data for the SH
reconstruction?
>>> What is the range of correlations for the interannual variability of detrended SH
average temp between the observations and the ensemble of reconstructions (95% confid
int) for the calibration period?
>>>
>>> What is the range of correlations for the decadal variability of detrended SH
average temp between the observations and the ensemble of reconstructions (95% confid
int) for the calibration period?
>>>
>>> Thanks, David
>>>
>>> ~~~~~~
>>> Prof David Karoly
>>> School of Earth Sciences
>>> University of Melbourne, VIC 3010, AUSTRALIA
>>> ph: +61 3 8344 4698
>>> fax: +61 3 8344 7761
>>> email: dkaroly@unimelb.edu.au
>>> http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
>>> ~~~~~~
>>>
>>> _____
>>> From: Raphael Neukom [neukom@giub.unibe.ch]
>>> Sent: 06 June 2012 09:46
>>> To: Joelle Gergis; David John Karoly
>>> Subject: Mistake in the Australasian TT paper

>>>
>>> Hi Joelle and David,
>>>
>>> As just discussed with joelle on skype, I found a mistake in our paper
>>> in journal of climate today.
>>>
>>> It is related to the proxy screening, so it is a delicate issue. In the
>>> paper we write that we do the correlation analysis for the screening
>>> based on detrended (instrumental and proxy) data, but in reality we did
>>> not use detrended data.
>>>
>>> The origin of the mistake is that at the stage when we were writing the
>>> paper my approaches have already evolved and I had made the proxy
>>> selection for the SH reconstruction based on detrended data. I therefore
>>> had in my mind that we had done the same for Australasia months ago and
>>> was very negligent not to check this carefully.
>>>
>>> Using detrended data would only select very few proxy records that would
>>> not allow a reasonable reconstruction. I think it is basically
>>> justifiable to do the screening without detrending but changing these
>>> words may cause troubles.
>>>
>>> Fortunately we have not received the proofs yet. So my suggestion is to
>>> write to the editor, explain the mistake and ask for permission to
>>> correct the error, if necessary via sending it out to review again.
>>>
>>> I apologize for the mistake and the troubles it may cause and hope that
>>> we can find a good way to correct it.
>>>
>>> David your advice on this would be very much appreciated
>>>
>>> Thanks a lot and best regards
>>> Raphi
>>>
>>>
>>>
>

34

Mistake in the Aus2K JoC paper

Joelle Gergis

Sent: 08 June 2012 10:38
To: s.phipps@unsw.edu.au; Ailie Jane Eyre Gallant
Cc: Raphael Neukom [redacted] David John Karoly
Importance: High
Attachments: Aus2K_detrended_vs_nondetr~1.png (26 KB)

Hi everyone

Following on from my attempt to gain permission to release non publically available records released and submitted online with NOAA over the weekend, on Wednesday morning Raphi discovered an error in the Aus2K temperature analysis.

In the paper we say:

For predictor selection, both proxy climate and instrumental data were linearly detrended over the 1921–1990 period to avoid inflating the correlation coefficient due to the presence of the global warming signal present in the observed temperature record. Only records that were significantly ($p<0.05$) correlated with the detrended instrumental target over the 1921–1990 period were selected for analysis.

When we went to recheck this, we discovered that the records used in the final analysis were not detrended for proxy selection making this statement incorrect.

The detrending of proxy records had been done in the Southern Hemisphere temperature paper, so wrongly assumed the same thing had been done in the Australasian paper. Given everything that has been going on over the past few months [redacted] in some ways it is unsurprising that something was missed. We are only human and were doing the best that we could.

Although it was a completely innocent mistake, it does have serious implications for the paper. As you'll see from the attached figure, solid line is R27 non detrended network, red dotted line is the detrended R9 network.

Raphi, David and I have been in discussion over the last 48 hours as to how to proceed and have decided that we need to alert the journal editor to this issue so they stop the production of the paper and we have a chance to fix the error.

Meanwhile, Stephen McIntyre and co have located the error overnight (I was alerted through an intimidating email this morning):

http://climateaudit.org/2012/06/06/gergis-significance

So instead of this being a unwanted but unfortunately normal part of science, we are likely to have an extremely negative online commentary about our work. Just thought you should be aware of this and the fact that we will now need to request the removal of the Aus2K reconstruction from the PAGES 2K consortium temperature paper etc until we correct things.

I hope you don't mind but I'm going to go ahead and write to John Chiang the editor from Journal of Climate who handled our submission.

If you have any advice or thoughts I'd be happy to hear them.

All the best

Joelle

--

Dr Joelle Gergis
Climate Research Fellow
School of Earth Sciences
University of Melbourne,
VIC 3010, AUSTRALIA
Ph: +61 3 834 49868
Fax: +61 3 834 47761
http://climatehistory.com.au

RE: Can you please comment on the attached ?

35

David John Karoly
Sent: 08 June 2012 11:47
To: Joelle Gergis
Attachments: Dear Dr Chiang DK.doc (29 KB)

Letter is fine. Some minor changes and a few corrections in attached file.

Best wishes, David

~~~~~~
Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
~~~~~~

From: Joelle Gergis
Sent: 08 June 2012 11:16
To: David John Karoly
Subject: Can you please comment on the attached ?

thanks

--

Dr Joelle Gergis
Climate Research Fellow
School of Earth Sciences
University of Melbourne,
VIC 3010, AUSTRALIA
Ph: +61 3 834 49868
Fax: +61 3 834 47761
http://climatehistory.com.au

Dear Dr Chiang

I am the first author of the paper 'Evidence of unusual late 20th century warming from an Australasian temperature reconstruction spanning the last millennium' JCLI ??? which was recently accepted for publication in the *Journal of Climate*.

While attempting to release non-publically available records used in our study with NOAA ~~over the~~this weekend, our team discovered an error in our paper.~~: 'Evidence of unusual late 20th century warming from an Australasian temperature reconstruction spanning the last millennium'.~~

In section 2.2 lines 220-224 of the paper we say:

For predictor selection, both proxy climate and instrumental data were linearly detrended over the 1921–1990 period to avoid inflating the correlation coefficient due to the presence of the global warming signal present in the observed temperature record. Only records that were significantly ($p<0.05$) correlated with the detrended instrumental target over the 1921–1990 period were selected for analysis.

When we went to recheck~~ed~~ this on Wednesday, we discovered that the records used in the final analysis were not detrended for proxy selection, making this statement incorrect.

The detrending of proxy records had been done in another paper on Southern Hemisphere temperature variations that we had been writing simultaneously, so we wrongly assumed the same thing had been done in the Australasian paper. The two lead authors on the paper were undergoing challenging personal circumstances at the time so this was not picked up until now.

Although it was an unfortunate data processing error, it does have implications for the results of the paper. ~~so though~~We wish to ~~we should~~ alert you to this issue before the paper goes into final production.

Meanwhile, independently of our team's detection of this error, prominent climate change ~~skeptic~~ blogger Stephen McIntyre has ~~located~~ identified the issue overnight (I was alerted through an intimidating email this morning):

http://climateaudit.org/2012/06/06/gergis-significance

So instead of this being a unwanted but unfortunately normal part of science, we are likely to have an extremely negative online commentary about our work and possibly the journal. We apologise in advance for any problems caused.

As you know, the paper has already been accepted and is posted on the 'Eearly online release' section of the *Journal of Climate* website. Until we have a chance to revise the submission, we suggest that the paper is removed.

Please let us know how you'd like us to proceed, be it through a revised or new submission.

All the best

Joelle Gergis, on behalf of the co-authors

36

Error in our JCLI-D-11-00649 submission

Joelle Gergis

Sent: 08 June 2012 12:35
To: John Chiang [chiang.jcli@ametsocmail.org]; Whittaker, Gwendolyn [gwhittaker@ametsoc.org]; JCLI Chief Editor [jcled@envsci.rutgers.edu]
Cc: Raphael Neukom [redacted] David John Karoly; s.phipps@unsw.edu.au; Ailie Jane Eyre Gallant
Importance: High
Attachments: Gergis_Manuscript_and_Supp~1.pdf (5 MB)

Dear Dr Chiang

I am the first author of the paper 'Evidence of unusual late 20th century warming from an Australasian temperature reconstruction spanning the last millennium' JCLI-D-11-00649 which was recently accepted for publication in the Journal of Climate.

While attempting to release non-publicly available records used in our study with NOAA this week, our team discovered an error in our paper.

In section 2.2 lines 220-224 of the paper we say:

For predictor selection, both proxy climate and instrumental data were linearly detrended over the 1921–1990 period to avoid inflating the correlation coefficient due to the presence of the global warming signal present in the observed temperature record. Only records that were significantly ($p<0.05$) correlated with the detrended instrumental target over the 1921–1990 period were selected for analysis.

When we went to recheck this on Tuesday, we discovered that the records used in the final analysis were not detrended for proxy selection, making this statement incorrect.

The detrending of proxy records had been done in another paper on Southern Hemisphere temperature variations that we had been writing simultaneously, so we wrongly assumed the same thing had been done in the Australasian paper. [redacted] this was not picked up until now.

Although it was an unfortunate data processing error, it does have implications for the results of the paper. We wish to alert you to this issue before the paper goes into final production.

Meanwhile, independently of our team's detection of this error, prominent climate change blogger Stephen McIntyre has identified the issue overnight (I was alerted through an intimidating email this morning):

http://climateaudit.org/2012/06/06/gergis-significance

So instead of this being a unwanted but unfortunately normal part of science, we are likely to have an extremely negative online commentary about our work and possibly the journal. We apologise in advance for any problems caused.

As you know, the paper has already been accepted and is posted on the 'Early online release' section of the Journal of Climate website. Until we have a chance to revise the submission, we suggest that the paper is removed.

Please let us know how you'd like us to proceed, be it through a revised or new submission.

All the best

Joelle Gergis, on behalf of the co-authors

--
Dr Joelle Gergis
Climate Research Fellow
School of Earth Sciences
University of Melbourne,
VIC 3010, AUSTRALIA
Ph: +61 3 834 49868
Fax: +61 3 834 47761
http://climatehistory.com.au

On 1/05/12 1:57 PM, "John Chiang" <chiang.jcli@ametsocmail.org> wrote:

> CC: chiang.jcli@ametsocmail.org
>
> Re: JCLI-D-11-00649
> Journal of Climate
>
>
> Dear Dr. Gergis,
>
> We are pleased to inform you that your manuscript, "Evidence of unusual late
> 20th century warming from an Australasian temperature reconstruction spanning
> the last millennium," has been accepted for publication in Journal of Climate.
>
> Congratulations!
>
> Your paper will begin production after AMS has received the appropriate Page
> and Color Charge Form from you or your funding administration. Links to the
> forms are below.
>
> Now that your manuscript has been accepted for publication, the peer-review
> editorial office no longer has control of it. If you need further
> information, please contact AMS Publications Coordinator Gwendolyn Whittaker
> (gwhittaker@ametsoc.org).
>
> Thank you for publishing in Journal of Climate
>

> Sincerely,
>
> Dr. John Chiang, editor
> Journal of Climate
>
>
> ****************************
> PRODUCTION INFORMATION
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> Questions about charges should be sent to Christine Keane
> (ckeane@ametsoc.org).
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> Gwendolyn Whittaker, Publications Coordinator, gwhittaker@ametsoc.org
>
>

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Aus2K contribution to the PAGES 2k consortium paper

Joelle Gergis

Sent: 08 June 2012 14:19
To: lucien.vongunten@pages.unibe.ch
Cc: Raphael Neukom [redacted]; s.phipps@unsw.edu.au; Andrew Lorrey [Andrew.Lorrey@niwa.co.nz]; David John Karoly
Attachments: Aus2K_JoC_Manuscript_and_S~1.pdf (5 MB)

Hi Lucien

While attempting to release non-publicly available records used in the Aus2K study on NOAA this week, our team discovered an error in our Journal of Climate paper.

In section 2.2 lines 220-224 of the attached paper we say:

For predictor selection, both proxy climate and instrumental data were linearly detrended over the 1921–1990 period to avoid inflating the correlation coefficient due to the presence of the global warming signal present in the observed temperature record. Only records that were significantly ($p<0.05$) correlated with the detrended instrumental target over the 1921–1990 period were selected for analysis.

When we went to recheck this on Tuesday, we discovered that the records used in the final analysis were not detrended during the proxy selection process, making this statement incorrect.

The detrending of proxy records had been done in another paper on Southern Hemisphere temperature variations that we had been writing simultaneously, so we wrongly assumed the same thing had been done in the Australasian paper. [redacted] this was not picked up until now. Everybody makes mistakes.

Although it was an unfortunate data processing error, it does have implications for the results of the paper. We have alerted the editors at Journal of Climate to put the paper on hold while we run a range of analyses which may form part of a revised submission.

In terms of the consortium paper, please run with the current version of the Aus2K temperature reconstruction but please note that it may change in coming weeks.

I will be spending three weeks in Switzerland fro 15 July-7 July so will try to have the revised reconstruction available at the end of this period.

Another thing you should be aware of is that our group has come under intense scrutiny from the climate change sceptic blogger Stephen McIntyre (Climate Audit) since the release of our paper online:

http://climateaudit.org

Since we mentioned that our 27-record temperature network was drawn from a broader pool of 62 proxy records, they have accused us of 'cherry picking' our results to 'manufacture a hockey stick'.

They are now demanded that the full network of records be made available. Over the past week I have been busy contacting authors of non publically available records that were not used in the final temperature reconstruction to attempt to release their data. Everyone managed to agree on just the C20th portions used for

calibration be released, but some still no not want to make their full records available.

This issue has implications for other 2K groups: **ANY mention of proxy 'screening' or selection criteria is likely to be heavily criticised**. Although we attempted to be transparent about our methodology, this has backfired and caused a lot of trouble.

I just thought you should be aware that it may not be enough that only the records used in the final analysis are already available. It is possible that every record from every region (those rejected from the analysis and those used in final reconstructions) will need to be made available once the consortium paper is published.

Sorry to be the bearer of bad news but I hope our group's negative experience will somehow help benefit the broader group.

All the best

Joelle

--
Dr Joelle Gergis
Climate Research Fellow
School of Earth Sciences
University of Melbourne,
VIC 3010, AUSTRALIA
Ph: +61 3 834 49868
Fax: +61 3 834 47761
http://climatehistory.com.au

On 7/06/12 7:44 PM, "lucien.vongunten@pages.unibe.ch" <lucien.vongunten@pages.unibe.ch> wrote:

> Dear PAGES 2k Network Leaders and Data Managers:
>
> The redaction team for the PAGES 2k Consortium has prepared a manuscript draft
> for the 2k consortium paper building on the concept sent to you previously and
> on the comments received from the regional groups. Note that this is a first
> draft and nothing in the manuscript is final yet. The writing team is looking
> forward to receive your comments, suggestions and revisions by June 18th (sent
> to Lucien).
> The regional groups may comment on every aspect of the manuscript. The support
> of the regional group is especially needed to help focus the text in terms of
> decadal variability within their region - for the 20th century and prior.
>
> Attached is also a first draft/concept for the Data and Methods description to

> be added in the Supplementary Online Material (SOM) section. We think that
> this section should be written with great care as parts of the reconstructions
> have not been published before. The success of the manuscript might hinge on
> the strength of the SOM.
>
> Also attached is the Excel file " Fig2.xlsx". This contains the data for all
> of the reconstructions on the original time scale and the uncertainties.
> Please make sure that the values that were plotted are correct! Also feel free
> to explore the data and test new approaches.
>
> Presently we have received final reconstructions from every region, except
> from Europe and Asia. In both cases the regional groups have produced time
> series, but there are still some open questions before the series can be
> finalized. We hope that this should be the case in the coming days.
>
> Timeline:
> - Reviews first draft back to PAGES IPO June 18th
> - Second draft sent to all consortium members June 29th
> - Reviews second draft back to PAGES IPO July 6th
> - Final version sent for agreement to all consortium members July 13th
> - Approval final version back to PAGES IPO July 17th
> - Submission of the paper by PAGES IPO Before July 31st
>
>
> Please forward this email to your group members (the group leaders who have
> not updated their member list are kindly asked to do so asap).
> If you have any suggestions or questions, please let us know.
>
> With best wishes,
> Lucien, on behalf of the PAGES 2k Redaction Team
>
>
>
>
>
> **********
> Dr. Lucien von Gunten
> Science Officer
> PAGES (Past Global Changes) International Project Office
> Zaehringerstrasse 25
> 3012 Bern
> Switzerland
>
> Phone: +41 31 631 5609
> Fax: +41 31 631 5606
> Email: lucien.vongunten@pages.unibe.ch
> <mailto:lucien.vongunten@pages.unibe.ch>
>

> website: www.pages-igbp.org <http://www.pages-igbp.org/>
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>

Evidence of unusual late 20th century warming from an Australasian temperature reconstruction spanning the last millennium

Joëlle Gergis[1], Raphael Neukom[1], Steven J. Phipps[2, 3], Ailie J.E. Gallant[1], David J. Karoly[1]

and PAGES Aus2K Project Members†

[1] School of Earth Sciences, University of Melbourne, Australia

[2] Climate Change Research Centre, University of New South Wales, Sydney, Australia

[3]ARC Centre of Excellence for Climate System Science, University of New South Wales, Sydney, Australia

Corresponding author

Dr Joëlle Gergis

School of Earth Sciences

University of Melbourne,

VIC 3010, AUSTRALIA

Email: jgergis@unimelb.edu.au

Manuscript submitted to *Journal of Climate*

† Aus2K project member data and other contributions from Kathryn Allen, Patrick Baker, Gretel Boswijk, Brendan Buckley, Matthew Brookhouse, Edward Cook, Louise Cullen, Mark Curran, Rosanne D'Arrigo, Pavla Fenwick, Anthony Fowler, Ian Goodwin, Pauline Grierson, Erica Hendy, Braddock Linsley, Janice Lough, Andrew Lorrey, Helen McGregor, Andrew Moy, Jonathan Palmer, Christopher Plummer, Chris Turney, Tessa Vance, Tas Van Ommen and Limin Xiong.

Abstract

This study presents the first multi-proxy warm season (September–February) temperature reconstruction for the combined land and oceanic region of Australasia (0°S–50°S, 110°E–180°E). We perform a 3000-member ensemble Principal Component Reconstruction (PCR) using 27 temperature proxies from the region. The proxy network explained 69% of the inter-annual variance in the HadCRUT3v SONDJF spatial mean temperature over the 1921–1990 calibration period. Applying eight stringent reconstruction 'reliability' metrics identified post A.D. 1430 as the highest quality section of the reconstruction, but also revealed a skilful reconstruction is possible over the full A.D. 1000–2001 period.

The average reconstructed temperature anomaly in Australasia during A.D. 1238–1267, the warmest 30-year pre-instrumental period, is 0.09°C (±0.19°C) below 1961–1990 levels. Following peak pre-industrial warmth, a cooling trend culminates in a temperature anomaly of 0.44°C (±0.18°C) below 1961–1990 levels between A.D. 1830–1859. A preliminary assessment of the roles of solar, volcanic, and anthropogenic forcings and natural ocean–atmosphere variability is performed using CSIRO Mk3L model simulations and independent palaeoclimate records. Solar and volcanic forcing does not have a marked influence on reconstructed Australasian temperature variations, which appear to be masked by internal variability.

In 94.5% of the 3000-member reconstruction ensemble, there are no other warm periods in the past 1,000 years that match or exceed post-1950 warming observed in Australasia. The unusual 20th century warming cannot be explained by natural variability alone, suggesting a strong influence of anthropogenic forcing in the Australasian region.

Keywords: temperature, Australasia, palaeoclimate reconstruction, last millennium, climate forcing, climate variability, climate change.

1. Introduction

Palaeoclimate records are fundamental in evaluating the long term context of recent regional and global climate variability. Extending our baseline of pre-industrial climate variations from climate proxies allows natural or internal variations to be isolated from anthropogenically forced changes using detection and attribution studies (Hegerl *et al.*, 2011). Uncertainties in future climate change projections depend not only on future emissions of greenhouse gases, but also on the ability of climate models to skilfully simulate past climate variability. Reconstructions of regional-scale temperature provide an extended basis for evaluating the accuracy of climate models in simulating past regional climate variability and an opportunity to reduce uncertainties associated with future climate variability and change (Hegerl et al., 2006; Hegerl et al., 2011).

In this study we consider the land and ocean region of Australasia, an area of Oceania comprising Australia, New Zealand and neighbouring islands in the Indian, Southern and Pacific Oceans bounded by 110°E–180°E and 0°S–50°S. Multi-decadal warming has been observed across much of Australasia as far back as the beginning of the 20th century. Since 1910 (the period of extensive high-quality observational records), Australia, the largest continental mass in Australasia, has experienced an annual mean land surface temperature increase of 0.9°C with approximately 0.7°C of the warming observed since 1960 (Della-Marta *et al.*, 2004; Keenan and Cleugh, 2011). 2001–2010 was the warmest decade recorded in both Australian land and sea surface temperature (SST) observations (Keenan and Cleugh, 2011). Increases in mean minimum and maximum temperatures have also been observed from stations on the north and south islands of New Zealand over the period 1961–2005 (Chambers and Griffiths, 2008). Recent work has found that the late 20th century and early 21st century (1980–2009) warming of Australian waters was 0.57°C higher than the early 20th century SSTs (1910–1939), with greatest increases reported off the south-eastern and south-western Australian coasts (Lough and Hobday, 2011).

Given the large warming trend observed in Australasian temperature records since the late 20th century, it is important to understand how regional climate in the region has fluctuated in pre-

industrial times – centuries before meteorological observations become available – and test how these palaeoclimate estimates can be used to evaluate climate model projections in this region. Current model projections suggest that Australian temperatures may rise between 0.7°C–1.2°C above 1990 levels by 2030, with a best estimate of 1°C (CSIRO, 2007). Increases of 1–5°C by 2070 are projected over various regions of Australia dependent on global greenhouse gas mitigation policies, with a best estimate of 1.8–3.4°C (CSIRO, 2007). Robust, well-verified palaeoclimate reconstructions can help evaluate global climate models relied upon by natural resource managers to plan for future climate change in the Australasian region by providing better estimates of decadal scale climate variations.

Reconstructions of past climate variability from Australasia are not only regionally important but contain core dynamical regions of several major atmospheric and oceanic circulation features that have a hemispheric or near-global influence e.g. El Niño–Southern Oscillation (ENSO), Inter-decadal Pacific Oscillation (IPO), Southern Annular Mode (SAM), Australian Monsoon, Indian Ocean Dipole, and the mid-latitude westerlies. Reconstructing past variations in the Australasian region therefore allows us to estimate the variability in these major climate modes associated with both natural and anthropogenic forcings. Ultimately this will allow us to better predict the evolution of these circulation features and their regional climatic impacts.

Northern Hemisphere multi-proxy temperature reconstructions show that recent warmth appears anomalous for at least the past 1,300 years (Jansen *et al.*, 2007; Mann *et al.*, 2008). The multi-proxy temperature reconstructions that are currently available for Southern Hemisphere (Jones *et al.*, 1998; Huang *et al.*, 2000; Mann and Jones, 2003; Mann *et al.*, 2008) are considerably more uncertain due to the limited availability of long proxy records and hitherto lack of consolidation of available records from the region (Neukom and Gergis, 2011). Huang *et al.*'s (2000) centennially-resolved borehole estimates from Australia, South America and Africa indicate that the magnitude of land surface warming over the past 500 years is estimated to be less in the Southern Hemisphere locations (0.8°C) than the Northern Hemisphere (1.1°C).

109 Despite advances in estimating hemispheric and global mean temperature trends over the last
110 2,000 years (Wahl *et al.*, 2010), there are still considerable uncertainties in understanding regional
111 responses to large-scale temperature changes from global radiative forcing (D'Arrigo *et al.*, 2009;
112 Mann *et al.*, 2009). Little is known about the magnitude and timing of temperature fluctuations in
113 Southern Hemisphere regions during the so-called 'Medieval Climate Anomaly' (MCA) warm
114 (A.D. 900–1250) or 'Little Ice Age' (LIA) cool (A.D.1400–1700) intervals described from
115 Northern Hemisphere climate reconstructions (Hughes and Diaz, 1994; D'Arrigo *et al.*, 2009; Mann
116 *et al.*, 2009; Diaz *et al.*, 2011; Graham *et al.*, 2011).

117 The IPCC AR4 section on climate of the last 2,000 years in the Australasian region (Jansen *et*
118 *al.*, 2007) focused on two annually-resolved tree ring-based land temperature reconstructions from
119 Australia and New Zealand, and a composite of 57 centennially-resolved borehole sites throughout
120 Australia (Cook et al., 2000; Cook et al., 2002a; Pollack et al., 2006). Silver Pine tree ring widths
121 from New Zealand suggest that 20th century warm season temperatures have been unusual, but not
122 unprecedented in the context of the past millennium in this sub region of Australasia (D'Arrigo et
123 al., 1998; Cook et al., 2002a; Cook et al., 2002b; Cook et al., 2006). For instance, two periods of
124 above average warmth are recorded in the western South Island Silver Pine record in the medieval
125 period around A.D.1137–1177 and 1210–1260. This represents temperatures 0.3–0.5°C higher than
126 the 1894–1998 average calibrated from the single station record of Hokitika (Cook et al., 2002b),
127 but is within the 0.4–0.7°C range of abrupt instrumental warming observed in the
128 anthropogenically-influenced period in the west coast of the South Island of New Zealand since
129 1950 (Hennessy *et al.*, 2007).

130 In contrast, the Huon Pine tree ring reconstructed temperature record from western Tasmania in
131 Australia shows more pronounced regional warming associated with warming of Indian and
132 Southern Ocean sea surface temperatures from around 1965 until the end of the record in 2001
133 (Cook *et al.*, 2000; Cook *et al.*, 2006). Over the past 2,000 years the temperature reconstruction
134 suggests that late 20th century temperatures were only exceeded by ~0.28°C for three short periods,

around 455 BC, 380 BC and AD 10 (Cook *et al.*, 2006). They conclude that late 20th century warming is unprecedented over the past 2,000 years in Tasmania and highly anomalous when viewed in the context of the past 3,602 years (Cook *et al.*, 2006).

The unusual nature of recent warmth is also suggested by a composite borehole temperature reconstruction for Australia which shows a temperature increase of approximately 0.5°C over the past 500 years, with 80% of the warming occurring during the 19th and 20th centuries (Pollack *et al.*, 2006). The record indicates that the 17th century was the coolest interval of the five-century reconstruction. Because most of the Australian boreholes were logged prior to 1976, the observed subsurface temperatures do not include the pronounced warming recorded over the last two decades of the 20th century, but currently provide the only baseline of pre-industrial temperature conditions experienced over the large-scale continental region of Australia (Pollack *et al.*, 2006; Jansen *et al.*, 2007).

In recent years, attention has expanded to quantifying regional temperature variations in palaeoclimate reconstructions in response to the radiative forcing associated with natural solar and volcanic variations, and increases in anthropogenic greenhouse gases concentrations (Mann *et al.*, 2005; Hegerl *et al.*, 2007b). In particular, there has been a focus on improving climate reconstructions of the last 2000 years as it is a period that contains marked temperature variations in many parts of the globe like the MCA, LIA and late 20th century warming (Jones and Mann, 2004; Jones *et al.*, 2009), and is the period when the majority of the Earth's precisely dated, high-resolution palaeoclimate records are available for direct calibration with instrumental records.

In response to the lack of continental-scale climate reconstructions in the IPCC AR4, in 2009 the International Geosphere–Biosphere Programme's (IGBP) Past Global Changes (PAGES) initiative developed the Regional 2k Network, a set of working groups to collect and process the best available proxy data to develop climate reconstructions in eight regions of the world (http://www.pages-igbp.org/workinggroups/2k-network; Newman *et al.*, 2009). The Australasia (Aus2k) working group is examining the Indo–Pacific region consisting of the landmasses of

Australia, New Zealand, the Indonesian archipelago and the neighbouring islands of the Pacific Ocean.

This paper is the Aus2k working group's regional consolidation of temperature proxies to provide a 'best estimate' of Australasian temperature variations over the past 1000 years. We present the development of the region's first multi-proxy combined land and ocean mean temperature reconstruction for the austral spring–summer (SONDJF) warm season. We assess multi-decadal temperature variations present in the reconstruction, and then identify extreme cool and warm periods to assess the long-term context of the anomalous late 20th century warming seen in observational records. Finally, we compare our results with 1000-year forced and unforced CSIRO MK3L climate model simulations. This provides a preliminary investigation of the importance of natural forcing, anthropogenic forcing and internal climate variability for Australasian temperature fluctuations over the past millennium and demonstrates the value of such reconstructions for detection and attribution studies.

2. Data and methods

2.1. Instrumental calibration data

In this study, Australasia is defined as the land and ocean areas of the Indo–Pacific and Southern Oceans bounded by 110°E–180°E, 0°–50°S. Our instrumental target was calculated as the September–February (SONDJF) spatial mean of the HadCRUT3v 5° x 5° monthly combined land and ocean temperature grid (Brohan *et al.*, 2006; Rayner *et al.*, 2006) for the Australasian domain over the 1900–2009 period. The SONDJF seasonal window correlates highly with the MAMJJA season (r=0.87) and the annual mean (r=0.93) on inter-annual timescales over the 1900–2010 period. Since the HadCRUT3v grid contains significant amounts of missing data in the pre-1900 period across the region, the 1850–1899 section was excluded from our analysis (Jones *et al.*, 1999; Brohan *et al.*, 2006).

To assess the large-scale coherence of land and ocean temperatures over the broad Australasian region, we performed a correlation analysis to identify all HadCRUT3v grid cells displaying a

187 significant positive correlation with the predictand over the 1900–1990 period (Figure S1). This
188 analysis revealed a high degree of spatial coherence of warm season temperatures over the
189 Australasian region with the exception of areas in Western Australia containing missing values,
190 parts of south east Asia influenced by local monsoon variability, the data sparse region of the
191 Southern Ocean, and the mountainous area of eastern Australia. Overall, 73% of grid cells (100 out
192 of 137) were significantly positively correlated ($p<0.05$) with the Australasian spatial mean (Figure
193 S1). This result is not surprising as the flat, arid continent of Australia and its surrounding ocean
194 dominates the majority of Australasian, confirming that reconstructing a spatial mean of coherent
195 temperature over the region is an acceptable approach for the region.

196 **2.2. Temperature predictor network**

197 Our temperature proxy network was drawn from a broader Australasian domain (90°E–140°W,
198 10°N–80°S) containing 62 monthly–annually resolved climate proxies from approximately 50 sites
199 (see details provided in Neukom and Gergis, 2011). This proxy network showed optimal response
200 to Australasian temperatures over the SONDJF period, and contains the austral tree ring growing
201 season during the spring–summer months. All tree ring chronologies were developed based on raw
202 measurements using the signal-free detrending method (Melvin *et al.*, 2007; Melvin and Briffa,
203 2008). All years where less than five tree ring series were available or Expressed Population Signal
204 (EPS; Briffa and Jones, 1990) values were below 0.85 were excluded from the analysis.

205 The only exceptions to this signal-free tree ring detrending method was the New Zealand Silver
206 Pine tree ring composite (Oroko Swamp and Ahaura), which contains logging disturbance after
207 1957 (D'Arrigo et al., 1998; Cook et al., 2002a; Cook et al., 2006) and the Mount Read Huon Pine
208 chronology from Tasmania which is a complex assemblage of material derived from living trees
209 and sub-fossil material. For consistency with published results, we use the final temperature
210 reconstructions provided by the original authors that includes disturbance-corrected data for the
211 Silver Pine record and Regional Curve Standardisation for the complex age structure of the wood

212 used to develop the Mount Read temperature reconstruction (E. Cook, personal communication,
213 Cook et al., 2006).

214 Although the Mount Read record from Tasmania extends as long as 3602 years, in this study we
215 only examine data spanning the last 1000 years which contains the better replicated sections of the
216 Silver Pine chronology from New Zealand (Cook et al., 2002b; Cook et al., 2006) and is the key
217 period for which model simulations have been run for comparison with palaeoclimate
218 reconstructions (e.g. Schmidt *et al.*, 2012).

219 All coral records with monthly, bimonthly or seasonal resolution were averaged over the
220 SONDJF period to align with the warm season reconstruction window. For predictor selection, both
221 proxy climate and instrumental data were linearly detrended over the 1921–1990 period to avoid
222 inflating the correlation coefficient due to the presence of the global warming signal present in the
223 observed temperature record. Only records that were significantly ($p<0.05$) correlated with the
224 detrended instrumental target over the 1921–1990 period were selected for analysis. This process
225 identified 27 temperature-sensitive predictors for the SONDJF warm season (Figure 1 and Table 1)
226 henceforth referred to as R27. Missing values in the predictor matrix during the calibration period
227 (0.4%) were infilled using principal component regression (Scherrer and Appenzeller, 2006;
228 Neukom *et al.*, 2011).

229 ## 2.3. Ensemble reconstruction method and verification

230 We performed an ensemble ordinary least squares regression Principal Component
231 Reconstruction (PCR) analysis (Neukom *et al.*, 2010; Gallant and Gergis, 2011; Gergis *et al.*, 2012)
232 using the 1921–1990 period for calibration and verification. Further description of the PCR method
233 is provided by Luterbacher *et al.* (2002), and details of the extension of the ensemble approach are
234 described below. To assess reconstruction uncertainty associated with proxy selection and
235 calibration, a 3000-member ensemble of reconstructions was calculated creating varying
236 reconstruction setting for each realisation by randomly:

- Removing five predictors from the full predictor matrix. In the early part of the reconstruction (1000–1456) where five or fewer proxies are available, the number of predictors used for each ensemble member varies between one and five. The effect of varying the number of proxies to be removed is illustrated in Figures S2.4 and S2.5.
- Varying the percentage of total variance of the predictor matrix explained by the retained PCs between 60% and 90% by varying the number of PCs used.
- Selecting a calibration period of 35–50 (non successive) years between 1921–1990 and using the remaining 20–35 years for verification.
- Scaling the weight of each proxy record in the PC analysis with a factor of 0.67 to 1.5. The effect of varying the weighting factor is illustrated in Figures S2.6 and S2.7.

To avoid variance biases due to the decreasing number of predictors back in time, the reconstructions of each model were scaled to the variance of the instrumental target over the 1921–1990 period. The mean of the 3,000-member ensemble was considered our 'best estimate' temperature reconstruction. To assess low frequency changes in Australasian temperatures, the ensemble mean was smoothed using a 30-year loess filter (Figure 3), which effectively removes variations with periods shorter than 15 years. To assess the influence of the loss of climate proxies back in time we also compare results from the R27 (all proxies), R21 (pre-1801 proxies), R14 (pre-1701 proxies) and R4 (pre-1458 proxies) networks (see supplementary section S2).

The ensemble PCR method allows us to quantify not only the traditional regression residual-based uncertainties referred to as 'calibration error' (e.g. Cook and Kairiukstis, 1990), but also the spread of the ensemble members generated from the random selection of the reconstruction parameters, described as the 'ensemble error'. The reconstruction confidence interval was defined as the combined calibration and ensemble standard error (SE), calculated as $SE = \sqrt{\sigma_{res}^2 + \sigma_{ens}^2}$ with σ_{res} denoting the standard deviation of the regression residuals and σ_{ens} the standard deviation of the ensemble members. Uncertainties of the filtered curves were calculated the same way using the residuals of the filtered data and standard deviation between the filtered ensemble members.

263 In addition to the 3,000 verification tests incorporated into the 1921–1990 overlap period
264 calculations, the ensemble mean was also further independently verified using withheld, early
265 1901–1920 data ('early verification'). Reconstruction 'reliability' was assessed using a set of eight
266 skill and robustness metrics for each year back in time (Table S6). Skill measures included the
267 calculation of mean Reduction of Error (RE), Root Mean Square Error (RMSE) and comparison
268 with reconstructions developed using random noise proxies. 'Skilful' years were identified when
269 the ensemble median RE (RMSE of the ensemble mean) was larger (smaller) than the
270 corresponding values of a reconstruction using AR1 noise predictors. If our predictor network
271 performed better than pure noise proxies, we assumed that our reconstruction is not simply a result
272 of 'overfitting' noise in the calibration period (McShane and Wyner, 2011). Reconstruction
273 'robustness' was assessed on inter-annual and decadal timescales by investigating changes in the
274 ensemble mean in response to changes in the predictor network or reconstruction ensemble
275 parameters. Years where the 30-year filtered ensemble mean and the running inter-annual variance
276 of the reconstruction did not change significantly with changes in the proxy network or ensemble,
277 were considered robust.

278 We assessed three different kinds of changes in the proxy network or ensemble: (i) using all
279 ensemble members vs. using only the ensemble members where a given proxy was excluded from
280 the predictor set (and repeating this for all proxies); (ii) using all proxies vs. using only the proxies
281 that are available at a given year (and repeating this for all years with different proxy availability);
282 and (iii) using all ensemble members vs. using only the ensemble members with positive RE in
283 each year. Applying these three tests on inter-annual as well as decadal timescales yields six
284 robustness criteria.

285 Next, we undertook instrumental verification analyses to test whether we could reasonably
286 reconstruct mean temperature from the whole Australasian field using instrumental data only from
287 grid cells within the R27 proxy network. This was done by applying the above reconstruction
288 method to instrumental data taken from the HadCRUT3v grid at locations closest to the 27 proxy

289 locations over the 1921 to 2000 period. Large amounts of missing data in the HadCRUT3v grid in
290 the early 20th century meant that only grids with less than 33.3% of data missing were used. For
291 further validation, the same analysis was also run using instrumental temperatures from the closest
292 Global Historical Climatology Network (GHCN) stations (Peterson and Vose, 1997) for land
293 temperature proxies and the HadISST data (Rayner *et al.*, 2003) for ocean temperature proxies.
294 Note that considerable amounts of missing data from a number of stations in our domain restricted
295 the GHCN analysis to the 1953–1992 period.

296 As a final 'pseudo instrumental' verification exercise, ten different variants of the HadCRUT3v
297 grid points were 'degraded' by including white noise so that the relationship (as measured by the
298 Pearson correlation) between the degraded grid cell and the original grid cell was the same as that
299 between the original grid cell and the proxy record. Since each proxy displays a different
300 correlation coefficient with its corresponding observation, the amount of white noise added was
301 correspondingly different at each location.

302 ## 2.4. Climate model simulations

303 To assess the role of climate forcing on our 'best estimate' warm season Australasian
304 temperature reconstruction over the past millennium, we compared our temperature reconstruction
305 results to a three-member ensemble of the CSIRO Mk3L climate system model version 1.2, a fully
306 coupled global atmosphere–ocean general circulation model (Phipps *et al.*, 2011; Phipps *et al.*,
307 2012). The model incorporates a 5.6 x 3.2 degree atmosphere with 18 vertical levels, a 2.8 x 1.6
308 degree ocean with 21 vertical levels, dynamic-thermodynamic sea ice and static vegetation and soil
309 types (Phipps *et al.*, 2011). Three transient simulations are considered here which incorporate the
310 effects of changes in orbital forcing, greenhouse gases (MacFarling–Meure *et al.*, 2006), solar
311 irradiance (Steinhilber *et al.*, 2009) and volcanic aerosols (Gao *et al.*, 2008) over the last
312 millennium (Phipps *et al.*, 2012). We also considered CSIRO Mk 3L 1000-year sections of a
313 10,000-year control run simulation to assess the relative roles of forced and unforced climate
314 variations in driving changes in Australasian temperature changes over the past 1000 years.

315 Although there are a number of model simulations that are currently available, in this study we
316 require the following two criterion be satisfied: i) availability of millennial length control
317 simulations to adequately characterise internal or unforced climate variability and ii) a multi-
318 member ensemble of 1000-year simulations forced with solar, volcanic and anthropogenic
319 greenhouse gases to distinguish between unforced and forced climate variability. Currently there are
320 very few Coupled Model Intercomparison Project (CMIP5) and Palaeoclimate Model Inter-
321 comparison Project (PMIP3) climate models that have ensembles of simulations for the last
322 millennium or extend past 1850 with a full suite of forcings. As such, we restrict our preliminary
323 comparison of variations in 3000-member Australasian temperature reconstruction ensemble to the
324 CSIRO Mk 3L model that has an ensemble of three simulations with the same forcings over the full
325 period of our temperature reconstruction ensemble (A.D 1000–2001). This allows us to better
326 estimate decadal variability due to internal noise from forced responses seen in the ensemble mean
327 of the model simulations. For a more extensive comparison of the Australasian temperature
328 reconstruction with climate model simulations, the reader is referred to Phipps *et al.* (2012).

329 ## 3. Results and discussion

330 ### 3.1. Reconstruction calibration, verification and quality assessment

331 The R27 network clearly captures observed inter-annual temperature variations in the
332 HadCRUT3v Australasian spatial mean (Figure 2, see also section S7). The full R27 network
333 ensemble mean was significantly correlated ($r = 0.83$) with the instrumental target over the 1921–
334 1990 period; explaining 69% of inter-annual variance in the calibration/verification interval. The
335 reconstruction and instrumental series were then linearly detrended to remove biases associated
336 with the 20th century warming trend. This returned a correlation coefficient of $r = 0.67$ over the
337 1921–1990 period (46% of explained inter-annual variance), indicating considerable skill in
338 reproducing inter-annual temperature variations, and the marked influence of global warming in
339 Australasia over recent decades.

340 The advantage of using an ensemble PCR reconstruction method is shown in Figure 3. Since the
341 reconstruction parameters are varied for each ensemble member, more extensive estimates of
342 reconstruction uncertainty are possible than results based on a single early/late
343 calibration/verification techniques used routinely in palaeoclimatology (for further discussion see
344 Gallant and Gergis, 2011; Gergis *et al.*, 2012). The ensemble mean is considered our 'best estimate'
345 reconstruction (Figure 4) and the solid line indicates years when each of the eight reliability metrics
346 were satisfied, providing a stringent measure of the most 'robust' sections of the reconstruction.

347 Since the motivation for using the ensemble approach is to perturb the reconstruction parameters
348 to generate extreme uncertainty cases, the ensemble mean reconstruction (Figure 4) is likely to be
349 conservative in comparison with previous reconstructions that tend to provide more limited
350 uncertainty estimation based on single period calibration/verification techniques. As such the thin
351 line represents periods of reduced reliability, but in fact yields a minimum of five out of eight
352 fulfilled reliability criteria. As seen in the lower panel of Figure 3 and Table S2.1, the entire
353 reconstruction back to AD 1000 has consistently positive median verification RE and early
354 verification RE values, so would traditionally be considered a statistically 'skilful' reconstruction
355 (Cook and Kairiukstis, 1990). We conclude that the reconstruction prior to 1430 is skilful but less
356 certain than the sections denoted by the solid line covering periods when more records are
357 available.

358 The differences between the full R27 proxy network and R21, R14 and R4 subsets are provided
359 in section S2. Note that in the first half of the millennium, uncertainty estimates in the ensemble
360 spread decline when the number of proxies drops below around five records (leaving fewer proxies
361 to include and exclude from the reconstruction), reducing the variability between the ensemble
362 members. This may explain, for example, the comparable uncertainty bands seen around
363 A.D.1100/1500, suggesting more coherence/discrepancies in the reconstruction made up of
364 fewer/more records during these times.

365 The instrumental verification analyses confirmed that is it possible to reconstruct the September–
366 February (SONDJF) spatial mean of the HadCRUT3v Australasian combined land and ocean
367 temperatures using instrumental data derived from observational data closest to the 27
368 palaeoclimate records listed in Table 1. The correlation of the SONDJF temperature reconstruction
369 based on these 27 HadCRUT3v grid cells and the full HadCRUT3v predictand was highly
370 significant (r=0.88) over the calibration interval (Figure S3.1), and remained strong even after linear
371 detrending (r=0.75). A mean verification RE of 0.58 was obtained over the 1921–2000 period.
372 Given the data quality issues noted above, it is unsurprising that the reconstruction results are
373 somewhat weaker using the 27 nearest GHCN stations (r=0.73) over the 1953–1992 period (r=0.67
374 detrended). Once again, a positive mean verification RE of 0.09 was found over the full
375 reconstruction interval (with a positive bias observed in the full histogram of REs provided in
376 Figure S3.2), suggesting that a skilful reconstruction of the HadCRUT3v Australasian SONDJF
377 spatial mean is indeed possible using the R27 network.

378 A final test of the ability of the reconstruction method to extract a real climate 'signal' from
379 noisy proxy data was performed using ten white noise degraded HadCRUT3v instrumental data sets
380 (previously described as 'pseudo instrumental' proxies in Section 2.3). An ensemble of
381 reconstructions was generated from each set of pseudo instrumental proxies and the resulting mean
382 reconstruction (Figure S3.3) indicates that skilful reconstructions are possible using these noise
383 degraded data sets. The correlations between the mean reconstructions from the ten sets of pseudo
384 instrumental proxies and the instrumental predictand were statistically significant, ranging from
385 0.55 to 0.75. The degraded instrumental verification RE values vary and range between -0.26 and
386 0.09 (Figure S3.3). The results provide evidence that our method can successfully extract an
387 underlying common temperature signal even when it is compounded by extraneous noise.

388 **3.2. Australasian SONDJF temperature variations AD 1000–2001**

389 Having verified the skill of the inter-annual Australasian SONDJF temperature reconstruction,
390 we now examine the full R27 3000-member ensemble to identify decadal scale temperature

391 variations over the past millennium. The results presented here concentrate on periods with large
392 anomalies. Any comparisons between the magnitudes of these anomalies must be internally
393 consistent for each reconstruction to preserve their internal and systematic variability. So, the
394 variations in member-*n* are compared only to member-*n* and these differences are then compared
395 across the entire ensemble. While systematic errors may influence the reconstructed temperature
396 variations within a single member these errors cancel across the ensemble, evidenced by the normal
397 distribution of errors surrounding the mean reconstruction (not shown).

398 Note that while this discussion focuses on the full R27 network, results for different proxy
399 networks are also presented in Tables 2 and Figures S2.1–S2.3 for comparison. A prominent feature
400 of the reconstruction is the warming beginning around 1900, with the most rapid increase from
401 1950 (Figure 4). For the R27 ensemble mean, the hottest decade, 30-year and 50-year period occur
402 after 1950. This holds true for 86.2%, 98.3% and 94.5% of individual ensemble members,
403 respectively (see Table S3.1 and Figure S3.4). For the mean reconstruction, the three warmest non-
404 overlapping decades occur consecutively from 1970–1979, 1980–1989 and 1990–1999. It is worth
405 noting that the 2000–2009 decade not covered by the palaeoclimate reconstruction is the warmest
406 recorded in the observational temperature data. Outside of the late 20th century, the next warmest
407 decades in our temperature reconstruction occur during the 1240s and 1330s (Table 2).

408 There is a warm peak in the mean reconstruction during the 1330s, followed by a cooling trend
409 culminating in the cold interval centred on the 1520s (Figure 4). A relative recovery from cool
410 conditions occurs by the 1580s, before cooling again from 1650–1680. Following brief warm
411 periods centred on 1710 and 1800, a rapid decline in temperature occurs from 1810 until 1860 – the
412 coldest interval in the 1002-year reconstruction. Temperature anomalies during the temperature
413 minimum in 1830–1859 were 0.44°C (±0.18°C) below the 1961–1990 average. Warming starts
414 from the 1860s onward, when a pronounced temperature increase coincides with a rapid rise in
415 anthropogenic greenhouse gas concentrations (see Figure S4.2). The increase in temperature is

interrupted by cool intervals ~1900–1910 and again around 1930, before monotonic warming on decadal and longer timescales continues from 1950 to present.

The R27 ensemble mean shows no other warm periods in the past millennium that match or exceed the post-1950 warming observed in the Australasian region. Periods of monotonic warming were determined for individual ensemble members. The longest period of warming across consecutive decades was calculated for each reconstruction. For 92.4% of members, this occurred during the 20th century and for these members almost always included the period from 1950–1999. This conclusion is robust against the proxy network chosen suggesting that highly anomalous late 20th century warming in the region is a robust feature of the reconstruction (Table 2).

3.3. Comparison with solar forcing

The five key solar grand minima based on solar observations over the past millennium are the Oort (1040–1080), Wolf (1280–1350), Spörer (1460–1550), Maunder (1645–1715), and Dalton (1790–1820) low solar periods (Steinhilber and Beer, 2011) (Figure 5). All of these episodes correspond to notable declines in reconstructed temperatures around the 1060s, 1280s, 1320s, 1520s, 1650s, 1680s and 1810s. The Wolf and Spörer intervals, however, also contain periods of relative warmth so do not appear to be exclusively associated with persistent cool temperatures.

Aside from the 1830s (a period coincident with marked internal variations described below), many of the coolest intervals recorded in our reconstruction coincide with solar minima. Average 30-year filtered temperature anomalies during the solar minima are significantly lower than outside the solar minima in the pre-industrial period (A.D. 1000–1850) in 74% of the ensemble members (Figure S8.1). The magnitude of the temperature anomalies observed within and outside of solar minima, however, are relatively minor with an average of 0.03°C (±0.05°C) compared to the 30-year filtered temperature standard deviation A.D. 1000–1850 (0.11±0.03°C). These results suggest the subdued role of solar forcing on regional temperature variations over the past millennium.

The so-called 'Little Ice Age' (LIA) described from the Northern Hemisphere is thought to extend from approximately A.D. 1400–1700, but possibly ending as late as 1850 (Mann *et al.*,

2009; Graham *et al.*, 2011). From the reconstruction presented here, the LIA appears to have a signature in Australasian temperatures from ~A.D. 1500–1840. The coolest 30-year average temperature anomaly reconstructed between 1830–1859 was 0.44°C (±0.18) below the 1961–1990 average.

Between the Oort and Wolf minima, a period of high solar activity from A.D. 1090–1270, coincides with the 'Medieval Climate Anomaly' (MCA), a prolonged warm period identified in many regions of the Northern Hemisphere spanning A.D. 900–1250 (Lamb, 1965; Hughes and Diaz, 1994; Mann et al., 2009; Diaz et al., 2011; Graham et al., 2011). In our Australasian temperature reconstruction, peak medieval warmth is observed around A.D. 1240–1360 (Figure 5). This is somewhat later than described from Northern Hemisphere regions and overlaps with part of the Wolf solar minimum. The average temperature anomaly in the Australian region calculated over the warmest pre-industrial 30-year average A.D. 1238–1267 period is 0.09°C (±0.19°C) below the 1961–1990 climatology.

In general, although many cool events in our reconstruction overlap with solar minima and vice versa, there are also periods where solar forcing does not match Australasian temperature fluctuations, indicating that no consistent decadal-scale response to solar variability in the region during the last millennium. This is reflected in the low correlations of our reconstruction with solar forcing (Steinhilber *et al.*, 2009): 200-year running correlations are significant for more than 50% (25%) of the ensemble members during only 6% (12%) of our reconstruction period (Figure S8.2).

3.4. Comparison with volcanic forcing

The last 1000 years contain a number of volcanic eruptions that correspond to declines in reconstructed Australasian warm season temperatures (Figure 5). During the LIA, several strong volcanic eruptions occurred during solar grand minima, enhancing (regional) cooling. The best examples of this are found in the early 19th century, a period of enhanced tropical volcanism, which includes the Tambora eruption of 1815 and the Dalton solar minimum (Robertson *et al.*, 2001; Gao *et al.*, 2008; D'Arrigo *et al.*, 2009). Although some the largest volcanic eruptions of the last

millennium are associated with slightly lagged cold peaks of decadal-scale temperatures (e.g. the 13th-century, 1452 and early 19th century eruptions), there is no significant immediate response to volcanic events identifiable at inter-annual timescales (Figures S8.3–S8.6). From the results presented here, the volcanic signal seems to be weaker in Australasia compared with regional reconstructions from the Northern Hemisphere (Hegerl *et al.*, 2011).

Intriguingly, arguably the largest volcanic event of the past millennium, the A.D. 1258 unknown tropical eruption, does not have a pronounced effect on our reconstructed Australasian temperature reconstruction. Discrepancies between volcanic forcing and reconstructed temperatures are also likely to reflect the fact that internal atmosphere–ocean circulation is the dominant source of variability on continental/regional scales, rather than external forcing which has been demonstrated to be more important on hemispheric/global scales (Goosse *et al.*, 2005).

3.5. Climate model comparison

From the start of industrialisation around 1850, the influence of solar and volcanic forcing on global climate begins to be overwhelmed by the rapid increase in anthropogenic greenhouse gas concentrations (Hegerl *et al.*, 2007a; Hegerl *et al.*, 2007b; Jansen *et al.*, 2007). Figure 6 shows reconstructed Australasian SONDJF temperatures and the ensemble mean of three transient CSIRO Mk3L model simulations relative to the 1961–1990 reference period to match the reconstruction. While the reconstruction and model simulations align well during the post 1850 industrial era, and reasonably well during some periods of volcanic eruptions, the model is generally too cool during the pre-industrial era. This cool bias suggests that the sensitivity of the model to anthropogenic greenhouse gases is a little too high relative to the reconstruction. Alternatively, this may reflect the fact that the model simulations omit the effects of several anthropogenic forcings, particularly changes in tropospheric aerosols, stratospheric ozone, vegetation and land use over the 1961–1990 base period. This may cause temperature anomalies to be too warm in recent decades (due to the absence of anthropogenic aerosol emissions, especially sulphates, that moderate the rate of warming due to anthropogenic greenhouse gases) and subsequently overestimate temperature anomalies in

494 past centuries. A possible loss of low frequency variance in the reconstruction (e.g. Esper *et al.*,
495 2005) may also explain parts of the lower amplitude in the reconstruction compared to the climate
496 model simulations.

497 Using a three-member model ensemble allows us to better estimate decadal variability due to
498 internal noise from forced responses seen in the ensemble mean of the model simulations. While the
499 correlation between the 30-year filtered temperature reconstruction and model ensemble mean over
500 the full A.D. 1000–2000 period is significant ($r=0.33$, $p<0.05$), the discrepancies noted above are
501 clear, particularly in the pre-1300 section of the reconstruction (Table 3). Given that the amplitude
502 and timing of specific unforced variations cannot be reproduced in model simulations because of
503 their stochastic nature, the reconstructed inter-decadal variations in the pre-industrial period match
504 the model simulations quite well (see Table 3 and section S4).

505 For example, Figure 6 shows that while some of the temperature declines in the reconstruction
506 are coincident with major volcanic events over the past millennium (particularly Kuwae in 1452
507 and Tambora in 1815), they do not coincide with all the temperature declines associated with
508 volcanic forcing in the model. Reasons for this may be because the volcanic forcing dataset is
509 exaggerating the magnitude of these eruptions (Robock, 2000) or the loss of variance associated
510 with palaeoclimate reconstructions (Esper *et al.*, 2005).

511 When shown relative to a 'pre-industrial baseline' of A.D. 1500–1850 (Figure S4.1), there are
512 only two pre-1900 periods in the mid-11th century and mid-13th century when the model ensemble
513 mean exceeds the reconstruction's uncertainty estimates. The latter is likely to be a direct result of
514 the A.D. 1258 volcanic forcing. Despite widespread evidence of a major volcanic eruption and
515 climatic impacts (Stothers, 2000; Oppenheimer, 2003), Figure 6 shows that this event does not
516 appear to be significant in the Australasian region. Conversely, the mid-11th century modelled
517 temperature anomaly may reflect inadequacies in regional volcanic and solar forcing data. This
518 period coincides with the Oort solar minimum but the timing and amplitude of solar variations are
519 substantially more uncertain during the first half of the millennium (Hegerl *et al.*, 2007a). Once

again, these issues may reflect the fact that internal atmosphere–ocean forcing is the dominant source of variability on regional/continental scales (Goosse *et al.*, 2005).

The relative roles of forced and unforced climate variability and change were also examined using the climate model simulations (Phipps *et al.*, 2012). Figure S4.2 shows the evolution of the Australasian mean SONDJF temperature over the last millennium, according to both the three forced simulations and three representative 1000-year sections of the unforced control simulation. On decadal timescales, differences between the ensemble members reveal stochastic variability arising from internal dynamics of the coupled atmosphere–ocean system. However, a common signal across the model ensemble mean also reveals the forced response to the three largest volcanic eruptions of the last millennium (AD 1258, Kuwae and Tambora).

On multi-decadal timescales, forced changes dominate over unforced internal variability in the model. However, in the reconstruction, the largest known volcanic eruption occurs during the warmest pre-industrial period (Table 2), while during the coldest period there is no anomalous solar forcing or large volcanic eruptions.

Conversely, in recent decades, anthropogenic forcing has a clear signal in the model data and is consistent with Australasian temperatures on decadal timescales, suggesting it is a possible mechanism for recent increases in Australasian temperatures (e.g. Karoly and Braganza, 2005). To assess the probability of the late 20th century warming occurring by chance due to unforced natural climate variability, we examined a 10,000-year pre-industrial control simulation using the CSIRO Mk3L climate system model.

Figure 7 shows the distribution of the changes in the mean Australasian SONDJF temperature between consecutive 50-year periods of this simulation. Over the full 10,000 years, the difference in temperature between consecutive 50-year periods never exceeds 0.10°C in magnitude. This contrasts with the reconstructed and measured (inter-annual) ensemble mean temperature change of 0.32°C ±0.06°C between 1901–1950 and 1951–2000. Figures S4.2, S4.3 and Section S8 provide further evidence that the post 1950 warming cannot be explained by natural factors alone. Figure

546 8.2 shows that the rapid rise in greenhouse gas concentrations observed in the late 20th century is
547 the dominant driver of temperature changes over recent decades. Thus, in the CSIRO Mk3L model,
548 anthropogenic forcing is required to produce the post 1950 warming observed in the reconstruction.
549 This suggests that the post 1950 warming did not arise as a result of unforced natural variability of
550 the coupled atmosphere–ocean system (Figure S4.3).

551 This result is consistent with detection and attribution studies that clearly attribute the post 1950
552 temperature increase noted in instrumental global and Australian temperature records to increases
553 atmospheric greenhouse gas concentrations (Karoly and Braganza, 2005; Hegerl *et al.*, 2007a). The
554 results presented here and in Phipps *et al.* (2012) demonstrate that anthropogenic factors are needed
555 to explain the most anomalous warm period observed in the Australasian region over the past 1000
556 years. For an extensive data–model comparison and regional attribution study for Australasia over
557 the last 1000 years, the reader is referred to Phipps *et al.* 2012.

558 4. Comparisons with independent palaeoclimate records

559 4.1. Temperature flucatuations over the last millennium

560 Peak pre-industrial warmth in Australasian temperature is observed around A.D. 1240–1360,
561 somewhat later than warming described from Northern Hemisphere regions (Figure 4). From the
562 ensemble mean 'best estimate' presented here, the average temperature anomaly in the Australian
563 region for the 1238–1267 period is 0.09°C (±0.19°C) below 1961–1990 levels. This 30-year
564 temperature anomaly is comparable with Northern Hemisphere results that suggest that maximum
565 pre-industrial temperatures were probably between 0.1–0.2°C below the 1961–1990 mean and
566 significantly below warm anomalies observed in instrumental records after 1980 (Jansen *et al.*,
567 2007). Reconstructed SSTs from a sedimentary record from the Makassar Strait (3°S, 119°E)
568 provides independent support for large positive anomalies similar to, though not significantly
569 warmer than modern values between ~A.D. 1000–1400 (Newton *et al.*, 2006; Oppo *et al.*, 2009).

570 The shift from peak pre-industrial warmth into a pronounced cooling ~A.D. 1300–1400 is
571 supported by palaeoclimate evidence and archaeological interpretations that indicate significant

572 societal impacts across the Pacific Basin at this time (Nunn, 2000; Nunn, 2007). The high-
573 resolution temperature reconstruction presented in Figure 4 suggests that a transition to cooler
574 conditions in the Australasian region is likely to have occurred after ~A.D. 1330. This timing agrees
575 with a shift in low frequency (centennial) circulation features in a reconstruction of mean synoptic
576 flow patterns for New Zealand that implicates enhanced westerly flow between ~A.D. 1250–1360 .
577 There is evidence that a more 'zonal' regime is associated with a shift from warm to cool climate
578 conditions, with cooler conditions associated with intensified atmospheric blocking in the southwest
579 Pacific during this period (Lorrey *et al.*, 2008; Lorrey *et al.*, 2011).

580 The results presented in Section 3 indicate that from the early 1300s onward, there is a gradual
581 cooling into a period that coincides with the timing of the Little Ice Age (LIA) interval, described
582 from the Northern Hemisphere as occurring between A.D. 1400–1700 (Mann *et al.*, 2009), or more
583 generally from A.D. 1500 to as recently as the beginning of the industrial era around 1850 (Mann *et*
584 *al.*, 2009; Graham *et al.*, 2011). Figure 4 suggests that similar cooling in the Australasian region
585 may have occurred somewhat earlier than the LIA period traditionally defined from the Northern
586 Hemisphere. Since our reconstruction may not be as spatially representative of the full Australasian
587 region at this time, it may mostly reflect variations experienced in the extra-tropical region of our
588 domain (see Table 1). Nonetheless section S2, which compares the earliest reconstruction nest with
589 the full ensemble mean reconstruction, shows that aside from a loss of variance, the R4 network
590 still adequately represents the broader Australasian region. Independent evidence for a coherent
591 Southern Hemisphere cool period from as early 1300s is also seen from low resolution tropical
592 Indonesian marine sediments (Oppo *et al.*, 2009).

593 Using a network of cave records and other hydroclimatic proxies, Lorrey *et al.* (2008) suggest
594 the general dominance of circulation patterns in the New Zealand sector that are associated with
595 cooler temperatures for the latter half of the last millennium until the late 19th century. An
596 independent coral composite record from the Great Barrier Reef, Australia indicate that from A.D.
597 1565 to 1700 SSTs off northeastern Australia were 0.2°–0.3°C cooler and more saline than 1860–

598 1985 averages (Hendy *et al.*, 2002). This cooling is in general agreement with a high-resolution
599 sedimentary record from Indonesia that suggests between 1550–1850, SSTs were 0.5°–1°C colder
600 than modern values (Oppo *et al.*, 2009).

601 The 1700–1850 period is recognised from Antarctica as being one of the most abrupt climate
602 shifts of the last 1000 years (Goodwin *et al.*, 2004; Mayewski *et al.*, 2004; Mayewski *et al.*, 2009).
603 During this time, ice cores indicate an increase in sea ice extent and an intensification of the
604 westerly winds in the mid-high latitudes of the Southern Hemisphere (Goodwin *et al.*, 2004;
605 Mayewski *et al.*, 2004), characteristic of a positive Southern Annular Mode (SAM) phase.
606 Comparable conditions to this early 19th century event are thought to have occurred during the
607 A.D. 1886–1903 and 1920–1929 periods (Goodwin *et al.*, 2004), also associated with cooling in our
608 reconstruction.

609 Finally, the idea of Australasia-wide cooling from the middle of the last millennium to the 19th
610 century is further supported by evidence of glacier fluctuations from New Zealand's Southern Alps
611 (~43°S, 170°E). The timing of major ice advances centred on 1605±70, 1735±50, 1785±10
612 and1845±40 (Schaefer *et al.*, 2009) suggests that pronounced cooling also influenced the Southern
613 Hemisphere region of Australasia particularly from the mid 16th–mid 19th century.

614 **4.2. Ocean–atmosphere interactions**

615 While low frequency variations of internal ocean–atmosphere interactions like the El Niño–
616 Southern Oscillation (ENSO) are known to have played an important role in influencing regional
617 temperature variations over the past millennium (Mann *et al.*, 2005; Hegerl *et al.*, 2007a; Mann *et*
618 *al.*, 2009; Li *et al.*, 2011), the nature and stability of regional climate variations are still unclear
619 (Lough, 2011; Gergis *et al.*, 2012). To assess the relationship of reconstructed Australasian warm
620 season temperatures and ENSO teleconnection, we compared our R27 reconstruction with the
621 Unified ENSO Proxy (UEP) developed by McGregor *et al.* (2010). The UEP represents the first
622 uncalibrated EOF of ten published ENSO reconstructions back to A.D. 1650 and probably
623 represents the least spatially-biased ENSO reconstruction currently available. Since a number of the

624 palaeoclimate records used in the current study have also been used in our previous ENSO
625 reconstruction work (Braganza *et al.*, 2009), the UEP was recalculated removing the Braganza *et al.*
626 (2009) data (proxies three and nine in McGregor *et al.* (2010)) to provide independent comparison
627 with our Australasian temperature reconstruction.

628 The relationship between inter-annual and inter-decadal ENSO variability and Australian
629 temperature is known to fluctuate over the 20th (Power *et al.*, 1999; Jones and Trewin, 2000). The
630 correlation coefficient between the 30-year filtered versions of the SOI (UEP) and our HadCRUT3v
631 SONDJF temperature predictand over the instrumental period is r= -0.34 (r= -0.32). Figure 8 shows
632 the 30-year running correlation between our inter-annual Australasian SONDJF temperature
633 reconstruction and the UEP in the post-1649 interval of overlap. The results display a mostly
634 negative relationship over the full period (r= -0.49) with considerable variability over past
635 centuries. Figure 7 confirms notable fluctuations in the influence of Pacific Ocean driven climate
636 variability and temperatures in the Australasian region during the instrumental period (e.g. the
637 1930s and 1940s), and lesser-known instabilities seen in the early 18th and 19th centuries.

638 Graham *et al.* (2011) present results from a coupled GCM showing that a slight warming of the
639 tropical Indian and western Pacific Oceans relative to the other tropical ocean basins may have
640 induced a broad range of the circulation and climate changes indicated by proxy data in the
641 medieval period, including many of those not explained by a cooler eastern tropical Pacific alone.
642 They suggest that tropical SSTs were the principal driver of large-scale climate variations during
643 the MCA, which was characterised by an enhanced zonal Indo-Pacific SST gradient. However, if
644 the Indo Pacific Warm Pool was indeed the origin of the relative warmth associated with the MCA,
645 then the temperature signal would be expected to be stronger in the Australasian region than in
646 hemispheric means. The lack of any strong 'MCA signal' in the reconstruction presented here
647 therefore appears to be inconsistent with the Graham *et al.* (2011) hypothesis, or may reflect
648 inadequacies in availability of records from tropical regions of Australasia during this period.

649 Shifts in ENSO variability in the core dynamical region of the Indo–Pacific region may
650 correspond to notable period of warmth reported in the high latitude region of the Southern Ocean.
651 Goosse *et al.* (2004) have proposed a delayed response to natural forcing due to the storage and
652 transport of heat anomalies by the deep ocean to explain the warm Southern Ocean around 1300s to
653 1400s as inferred from three Southern Hemisphere climate proxies used by Mann and Jones (2003)
654 and additional Antarctic ice cores.

655 The delay in the Southern Hemisphere temperature response to external climate forcing may
656 have implications for the evolution of future climate change in the region. Model studies suggest
657 that the present-day Southern Ocean temperatures lag the increases in greenhouse-gas
658 concentrations observed during the recent decades (Goosse *et al.*, 2004). This implies that it is
659 possible that large warming of the Southern Ocean will occur when the warm deep water formed
660 during the 20th century reaches the surface in coming decades (Goosse *et al.*, 2004).

661 **4.3. Comparison with Australian borehole temperature reconstruction**

662 A comparison with the only continental-scale Australian borehole temperature reconstruction
663 available for IPCC AR4 indicates that the (low frequency) borehole estimates fall within the cooler
664 section of our uncertainty estimates until around 1800, before shifting closer to our 'best estimate'
665 ensemble mean or the warmer uncertainty range until present day (Figure S5). This confirms the
666 expected result that the rise in surface temperatures over the Australian landmass has been greater
667 than within a broader regional domain combining land and ocean temperatures.

668 Since most of the boreholes were logged prior to 1976, the observed subsurface temperatures do
669 not capture the strong warming experienced by Australia in the last two decades of the 20th century
670 (Pollack *et al.*, 2006), but is captured in the temperature reconstruction presented here. In terms of
671 cold periods, the borehole record suggests that the 17th century was the coolest interval, in contrast
672 to the strong evidence for coldest conditions in the Australasian region between 1810–1860. This
673 highlights the inability of boreholes used in IPCC AR4 (Pollack *et al.*, 2006; Jansen *et al.*, 2007) to

674 adequately capture the multi-decadal variations seen in Figure 4, and the importance of high-
675 resolution palaeoclimatology in improving estimates of regional decadal climate variations.

676 Overall, the results presented here suggest that the second half of the 20th century (1951–2000)
677 was 0.34°C warmer than average preindustrial conditions (A.D. 1651–1700, the cold phase before
678 the borehole temperatures start to increase). This corresponds with the Australian (land-only)
679 borehole estimate and the Northern Hemisphere (Mann *et al.*, 2008) of 0.52°C and 0.56°C,
680 respectively. The differences in magnitude between these anomalies may reflect the small land/sea
681 ratio for the Australasian region, perhaps combined with a delayed Southern Hemisphere response
682 to anthropogenic warming.

683 ## 5. Conclusions

684 This study presents the first warm season (September–February) temperature reconstruction for
685 the Southern Hemisphere combined land and oceanic region of Australasia. To provide robust
686 uncertainty estimates, we perform an ensemble Principal Component Reconstruction (PCR)
687 technique using 27 temperature proxies from the region. The R27 (R4) proxy network was
688 significantly correlated (r= 0.83 (0.67)) with the HadCRUT3v SONDJF spatial mean temperature
689 over the 1921–1990 period. Application of eight stringent reconstruction reliability metrics
690 identified the period after A.D. 1430 as the highest quality section of the reconstruction, but also
691 revealed a skilful reconstruction is possible over the entire millennium.

692 There is broad agreement between reconstructed and CSIRO Mk3L model simulated
693 temperatures during the pre-industrial era. Solar and volcanic forcing does not seem to have a
694 distinct and consistent signal in the reconstructed decadal-scale temperature variations and appear
695 to be masked by internal variability. In contrast, the response of Australasian temperature variations
696 to anthropogenic forcing is clear. The results presented here and in Phipps *et al.* (2012) demonstrate
697 that anthropogenic factors are needed to explain the most anomalous warm period reconstructed in
698 the Australasian region over the past 1000 years. This finding is consistent with detection and
699 attribution studies that clearly attribute the post 1950 temperature increase noted in instrumental

700 global and Australian temperature records to increases atmospheric greenhouse gas concentrations
701 (Karoly and Braganza, 2005; Hegerl *et al.*, 2007a).

702 Our reconstruction suggests that peak pre-industrial warmth occurred in Australasia around A.D.
703 1240–1360, somewhat later than described from Northern Hemisphere regions. The maximum
704 temperature anomaly in the Australian region calculated over the A.D. 1238–1267 period is 0.09°C
705 (±0.19°C) below 1961–1990 levels. It is worth noting that this medieval warming occurred in the
706 absence of significant anthropogenic greenhouse gas emissions, thus is not analogous to post 1950
707 observed warming which is predominantly anthropogenically-forced (Karoly and Braganza, 2005;
708 Hegerl *et al.*, 2007a). This implies that if the full range of natural climate variability has not yet
709 been observed in Australasia, anthropogenic forcing may led to future 'climate surprises' that may
710 manifest, for example, as changes in the frequency and duration of regional temperature extremes
711 (Alexander and Arblaster, 2009).

712 Following maximum pre-industrial warmth around A.D.1330, a cooling trend that lasts several
713 hundred years begins. This cooling eventuates in a minimum temperature anomaly of -0.44°C by
714 ~1840 during the peak of the Northern Hemisphere's 'Little Ice Age'. Our results support the
715 notion that a pronounced cool period consistent with the timing of the LIA extended well outside of
716 the Northern Hemisphere high latitudes and into the tropical and subtropical regions of the Southern
717 Hemisphere (Newton *et al.*, 2006).

718 The results introduced here are significant for a number of reasons. This Australasian
719 temperature reconstruction is the first high-resolution, multi-proxy study available for the region,
720 and only the second large-scale regional synthesis available from the Southern Hemisphere
721 (Neukom *et al.*, 2011). Given that instrumental observations in Australasia generally extend back, at
722 best, to the early 20th century, the palaeoclimate temperature estimates presented here now provide
723 an extended basis for evaluating the accuracy of climate models in simulating past regional climate
724 variability and an opportunity to reduce uncertainties associated with future climate variability and
725 change (Hegerl et al., 2006; Hegerl et al., 2011). This study provides pre-industrial estimates of

726 decadal temperature variations as far back as A.D. 1000, which may help to quantify the role of
727 natural and anthropogenic forcing on regional climate variations as demonstrated in other regions of
728 the world (Hegerl *et al.*, 2006; Hegerl *et al.*, 2011).

729 Our work provides a significant improvement on the uncertainties reported in the IPCC AR5 for
730 the Australasian region (CSIRO, 2007; Jansen *et al.*, 2007), and Northern Hemisphere-centric
731 understanding of climate variations that have occurred over the past 1000 years (Lamb, 1965;
732 Grove, 1988; Hughes and Diaz, 1994; Crowley and Lowery, 2000; Bradley *et al.*, 2003; Mann *et*
733 *al.*, 2009; Graham *et al.*, 2011). Future research will focus on consolidating Australasian
734 palaeoclimate data with other Southern Hemisphere regions to advance our understanding of global
735 change over the past millennium.

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745

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8. Table captions

Table 1. Proxy data network used in the Australasian SONDJF temperature reconstruction. Note that all coral records are averaged over the September–February period.

Table 2. Warmest and coolest decades (top) and non-overlapping 30-year periods (bottom) calculated for the R27, R21, R14 and R4 networks. Average temperature anomalies relative to the 1961–1990 base period are shown in brackets.

Table 3. Correlations between R27 temperature reconstruction and CSIRO Mk3L model ensemble means. Bolded values are significant as determined by a normal distribution white noise p-value, $p<0.05$.

9. Figure captions

Figure 1. Location of the tree ring (green), coral (blue) and ice core (orange) records used in the R27 predictor network (top) and corresponding temporal coverage of proxy records 1000–2001 (bottom). The dashed line encloses the target region of Australasia defined by the domain 0°S–50°S, 110°E–180°E. Note that multiple climate proxies are available for some sites.

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Figure 3. 3000-member temperature reconstruction ensemble (top) with ensemble median RE over verification intervals within the 1921–1990 overlap period (black, middle) and RE of the ensemble mean over 1900–1920 early verification period (red, bottom). Coloured lines represent a percentile grouping of the ensemble members. The area between the black lines encloses all (100%) members; the area between the lowest (1st percentile) and the highest blue lines (99th percentile) encloses 98% of the members and so on. The dark red line represents the median.

1044 **Figure 4**. Australasian September–January mean temperature reconstruction, A.D. 1000–2001.
1045 Solid line represents the 30-year filtered ensemble mean reconstruction based on multivariate
1046 principal component regression performed on a 3000-member ensemble. The 95% combined
1047 ensemble and calibration uncertainties are denoted by grey shading. Most reliable periods of the
1048 reconstruction (as determined by six reconstruction skill and stability metrics) are shown by solid
1049 black line with less reliability indicated by the thin black line. Instrumental HADCRUT3v
1050 combined land and ocean temperature data over the 1900–2009 period shown in green. All
1051 anomalies are calculated relative to a 1961–1990 base period.

1052 **Figure 5**. Comparison of the Australasian SONDJF ensemble mean temperature reconstruction
1053 (solid black line) with solar grand minima (pink shading) and the Southern Hemisphere component
1054 of Gao *et al.*'s (2008) global volcanic sulphate aerosol injection dataset (blue). The 95% combined
1055 ensemble and calibration reconstruction uncertainties are denoted by grey shading.

1056 **Figure 6.** Comparison of the 30 year filtered Australasian SONDJF ensemble mean temperature
1057 reconstruction (solid black line) with the ensemble mean of three model simulations derived from
1058 the CSIRO Mk3L model developed by Phipps *et al.* (2011). The 95% combined ensemble and
1059 calibration reconstruction uncertainties are denoted by grey shading. All anomalies are calculated
1060 relative to a 1961–1990 base period.

1061 **Figure 7**. The distribution of the changes in Australasian mean SONDJF temperature between
1062 consecutive non-overlapping 50-year periods of a 10,000-year pre-industrial control simulation.

1063 **Figure 8**. 30-year running correlation between the R27 Australasian temperature reconstruction
1064 and a modified version of the McGregor *et al.* (2010) Unified ENSO Proxy (UEP) which excludes
1065 Australasian proxies used in the Braganza *et al.* (2009) study.

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1066 **Table 1**. Proxy data network used in the Australasian SONDJF temperature reconstruction. Note
1067 that all coral records are averaged over the September–February period.

	Record name	Archive	Start year	End year	Lon (°E)	Lat (°S)	Location	Proxy variable	Reference/s
1	Mt Read	Tree rings	999	2001	147	42	Australia	Tree ring width	Cook *et al.* (2006)
2	Oroko	Tree rings	999	2001	170	43	New Zealand	Tree ring width	Cook *et al.* (2006)
3	Palmyra	Coral	1149	1998	162	6	Northern Line Ids	δ18O	Cobb *et al.* (2003)
4	Celery Top Pine East	Tree rings	1430	1994	148	42	Australia	Tree ring width	Allan *et al.* (2001)
5	Pink Pine South Island composite	Tree rings	1457	1999	172	42	New Zealand	Tree ring width	Duncan *et al.* (2010)
6	Urewera	Tree rings	1462	1987	177	39	New Zealand	Tree ring width	Xiong and Palmer (2000)
7	Buckley's Chance	Tree rings	1463	1991	146	42	Australia	Tree ring width	Buckley *et al.*(1997)
8	North Island_LIBI_Composite_1	Tree rings	1526	1992	175	39	New Zealand	Tree ring width	Xiong and Palmer (2000)
9	Takapari	Tree rings	1533	1992	176	40	New Zealand	Tree ring width	Xiong and Palmer (2000)
10	Mangawhero	Tree rings	1551	1994	175	39	New Zealand	Tree ring width	D'Arrigo *et al.* (1998; 2000)
11	Kauri	Tree rings	1577	2002	174	36	New Zealand	Tree ring width	Fowler *et al.*(2008)
12	Fiji_AB	Coral	1617	2001	179	17	Fiji	δ18O	Linsley *et al.* (2006)
13	NI_LIBI_Composite_2	Tree rings	1651	1990	174	39	New Zealand	Tree ring width	Xiong and Palmer (2000)
14	New_Caledonia	Coral	1658	1992	166	22	New Caledonia	δ18O	Quinn *et al.* (1998)
15	Stewart_Island_HABI_composite	Tree rings	1758	1993	168	47	New Zealand	Tree ring width	D'Arrigo *et al.* (1996; 1998; 2000)
16	Rarotonga	Coral	1761	1996	160	21	Cook Islands	δ 18O	Linsley *et al.* (2006; 2008)
17	Vostok	Ice core	1774	1999	107	78	Antarctica	δ18O	Ekaykin *et al.* (2004)
18	Vostok	Ice core	1774	1999	107	78	Antarctica	Accumulation	Ekaykin *et al.* (2004)
19	Fiji_1F	Coral	1780	1997	179	17	Fiji	δ18O	Linsley *et al.* (2004)
20	Bali	Coral	1783	1989	115	8	Indonesia	δ18O	Charles *et al.*(2003)
21	Abrolhos	Coral	1794	1993	114	28	Australia	δ18O	Kuhnert *et al.* (1999)
22	Maiana	Coral	1840	1994	173	1	North Gilbert Ids	δ18O	Urban *et al.* (2000)
23	Bunaken	Coral	1863	1990	123	3	Indonesia	δ18O	Charles *et al.*(2003)
24	Rarotonga.3R	Coral	1874	2000	160	21	Cook Islands	δ18O	Linsley *et al.* (2006; 2008)
25	Ningaloo	Coral	1878	1995	114	22	Australia	δ18O	Kuhnert *et al.* (2000)
26	Madang	Coral	1880	1993	146	5	Papua New Guinea	δ18O	Tudhope *et al.* (2001)
27	Laing	Coral	1884	1993	145	4	Papua New Guinea	δ18O	Tudhope *et al.* (2001)

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Table 2. Warmest and coolest decades (top) and non-overlapping 30-year periods (bottom) calculated for the R27, R21, R14 and R4 temperature proxy networks. Average temperature anomalies relative to the 1961–1990 base period are shown in brackets.

Decades (Start year indicated)

	R27	R21	R14	R4
Warmest decade	1990 (+0.11)	1990 (+0.11)	1990 (+0.15)	1990 (+0.12)
2nd warmest	1980 (+0.11)	1980 (+0.10)	1980 (+0.10)	1980 (+0.08)
3rd warmest	1970 (+0.02)	1970 (+0.03)	1970 (-0.00)	1970 (-0.01)
4th warmest	1240 (-0.01)	1240 (-0.02)	1240 (-0.02)	1240 (-0.01)
5th warmest	1330 (-0.02)	1330 (-0.03)	1330 (-0.03)	1330 (-0.03)
Coldest decade	1830 (-0.47)	1830 (-0.47)	1520 (-0.45)	1320 (-0.41)
2nd coldest	1840 (-0.47)	1840 (-0.46)	1830 (-0.44)	1730 (-0.40)
3rd coldest	1520 (-0.45)	1520 (-0.45)	1650 (-0.44)	1060 (-0.40)
4th coldest	1650 (-0.44)	1760 (-0.43)	1680 (-0.42)	1830 (-0.40)
5th coldest	1900 (-0.44)	1650 (-0.43)	1320 (-0.40)	1520 (-0.39)

Non-overlapping 30-year periods

	R27	R21	R14	R4
Warmest	1971-2000 (+0.09)	1971-2000 (+0.09)	1971-2000 (+0.10)	1971-2000 (+0.07)
2nd warmest	1238-1267 (-0.09)	1238-1267 (-0.09)	1238-1267 (-0.09)	1238-1267 (-0.09)
3rd warmest	1330-1359 (-0.10)	1330-1359 (-0.11)	1330-1359 (-0.11)	1330-1359 (-0.10)
Coldest	1830-1859 (-0.44)	1829-1858 (-0.43)	1634-1663 (-0.40)	1828-1859 (-0.38)
2nd coldest	1634-1663 (-0.40)	1634-1663 (-0.40)	1829-1858 (-0.39)	1056-1085 (-0.37)
3rd coldest	1884-1913 (-0.38)	1056-1085 (-0.36)	1056-1085 (-0.36)	1886-1915 (-0.36)

1073 **Table 3**. Correlations between R27 temperature reconstruction and CSIRO Mk3L model ensemble
1074 means. Bolded values are significant as determined by a normal distribution white noise p-value,
1075 $p<0.05$.

Interval	Inter-annual correlation	30-year filtered correlation
1000–2000	**0.27**	**0.33**
1000–1300	-0.04	-0.01
1301–1600	0.09	**0.15**
1601–1900	**0.18**	**0.27**
1901–2000	**0.77**	**0.90**

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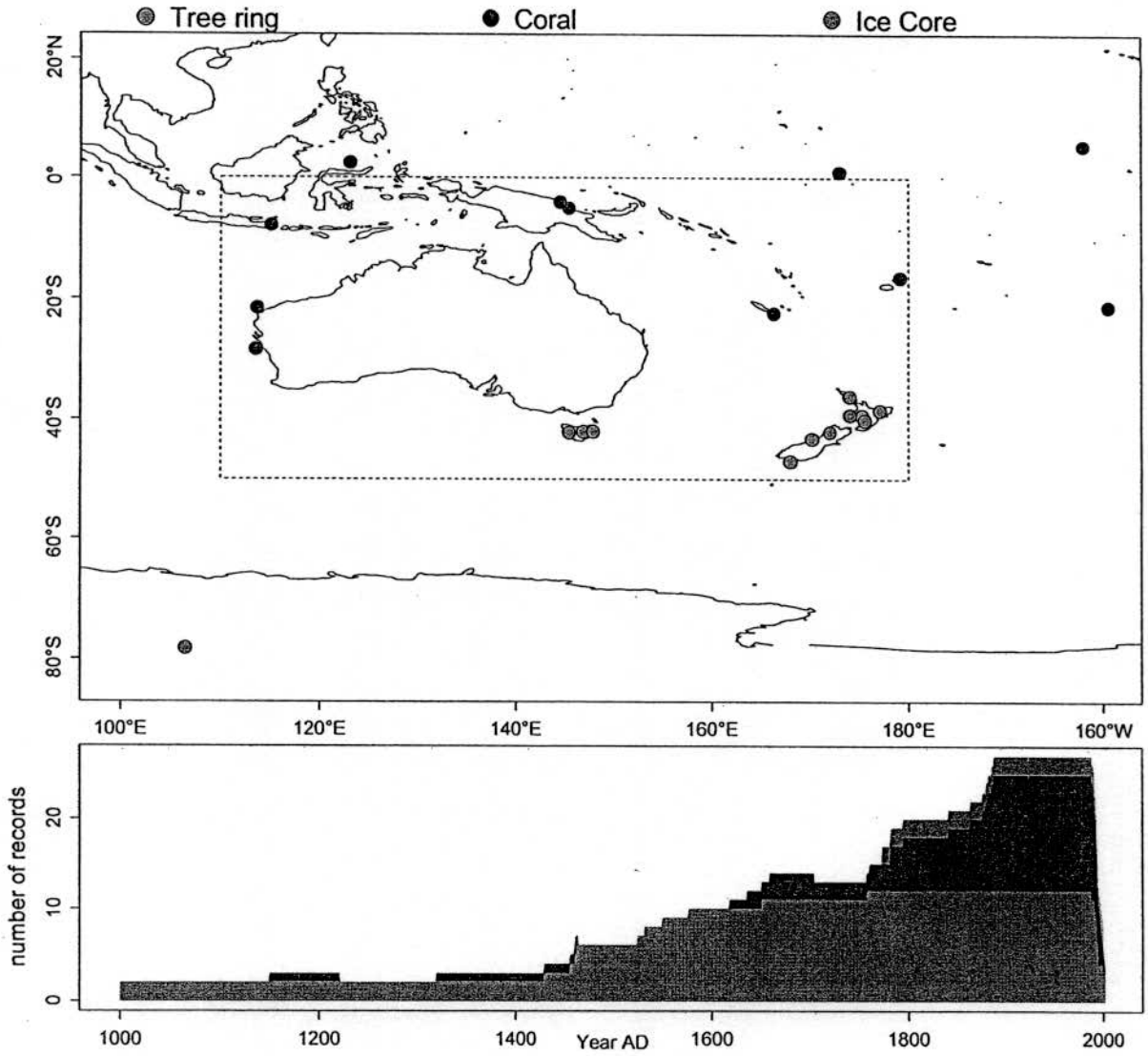
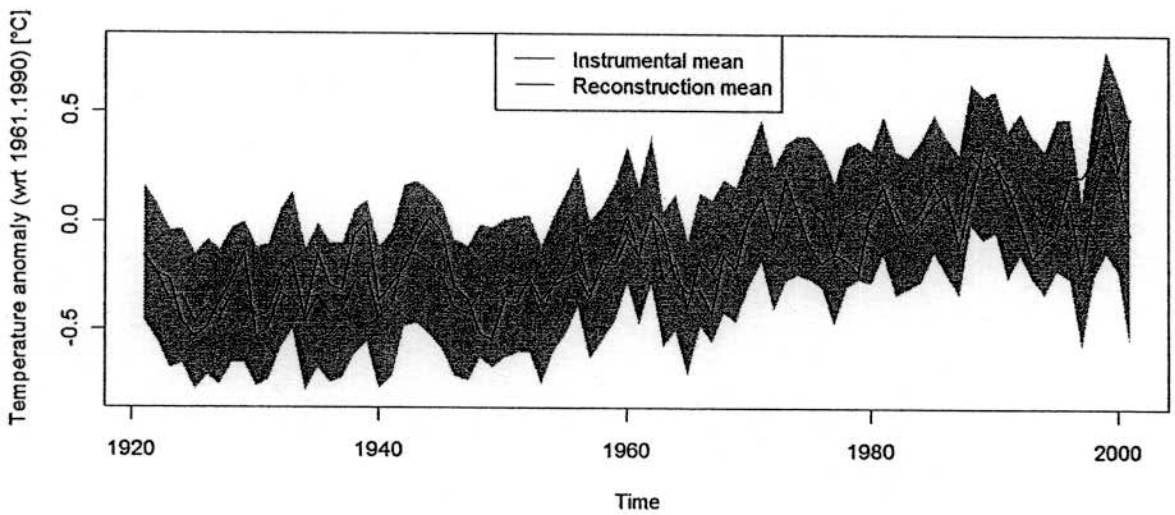


1077

1078 **Figure 1**. Location of the tree ring (green), coral (blue) and ice core (orange) records used in the
1079 R27 predictor network (top) and corresponding temporal coverage of proxy records 1000–2001
1080 (bottom). The dashed line encloses the target region of Australasia defined by the domain 0°S–50°S,
1081 110°E–180°E. Note that multiple climate proxies are available for some sites.



1082
1083 **Figure 2**. Instrumental (black) and reconstructed (red) September–February HadCRUT3v spatial
1084 mean temperature calculated for the Australasian region (110°E–180°E, 0°–50°S) over the 1921–
1085 2001 period. 2SE uncertainty intervals of the reconstruction are shaded.

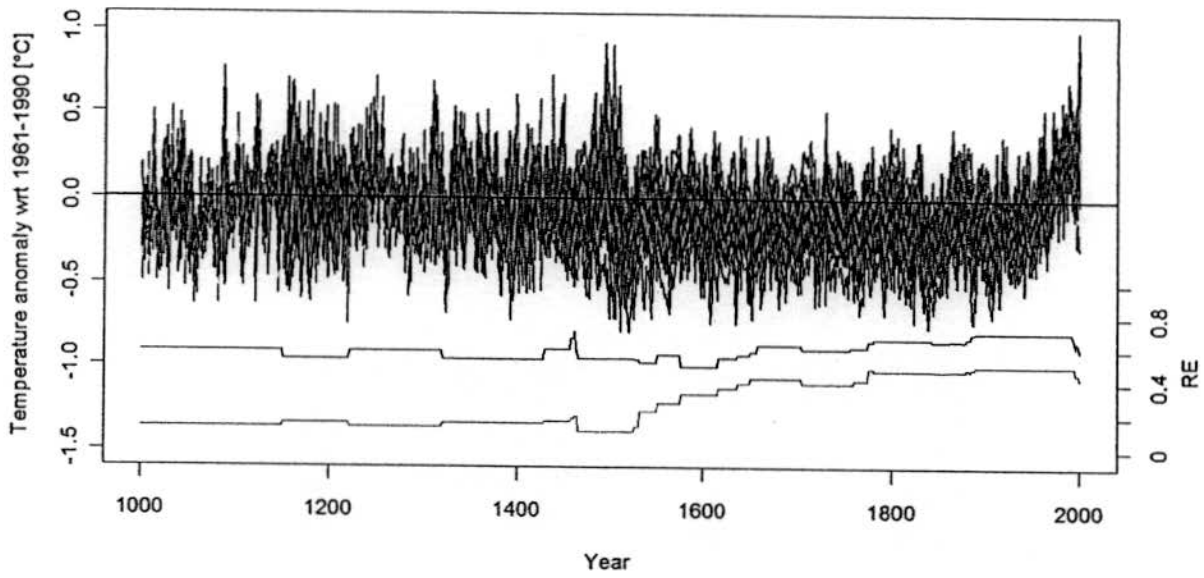


Figure 3. 3000-member temperature reconstruction ensemble (top) with ensemble median RE over verification intervals within the 1921–1990 overlap period (black, middle) and RE of the ensemble mean over 1900–1920 early verification period (red, bottom). Coloured lines represent a percentile grouping of the ensemble members. The area between the black lines encloses all (100%) members; the area between the lowest (1st percentile) and the highest blue lines (99th percentile) encloses 98% of the members and so on. The dark red line represents the median.

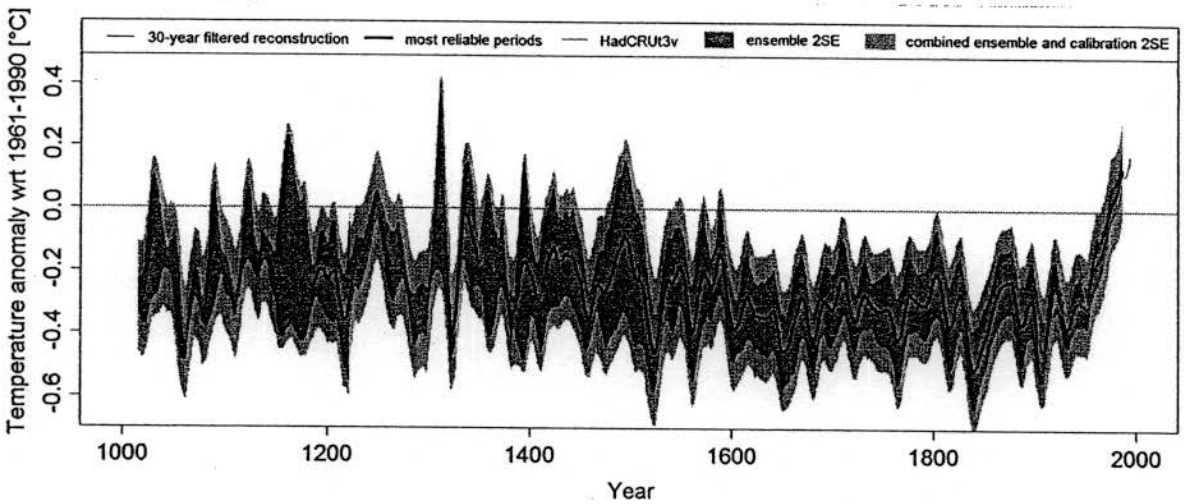
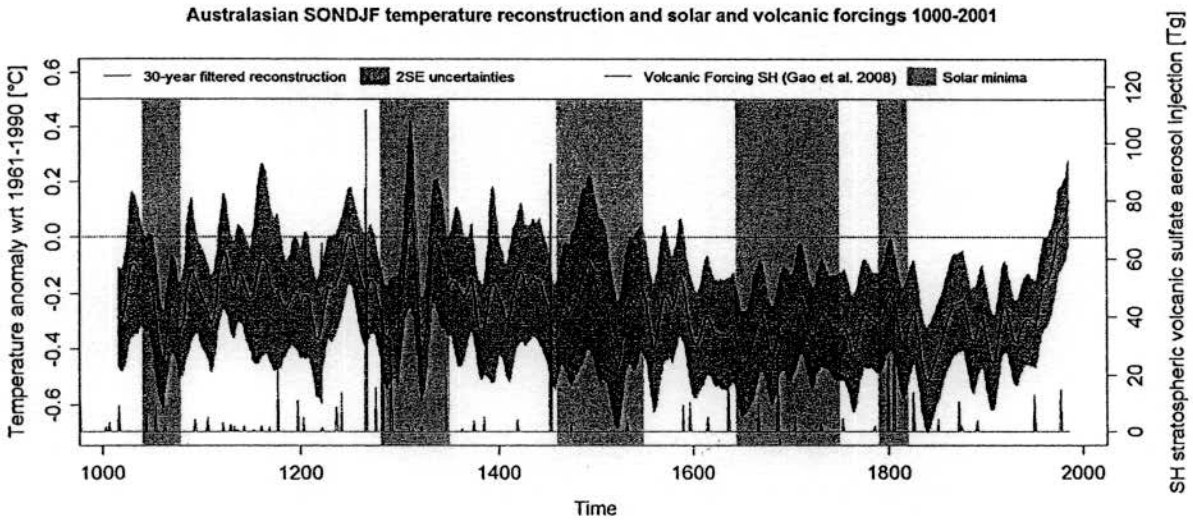
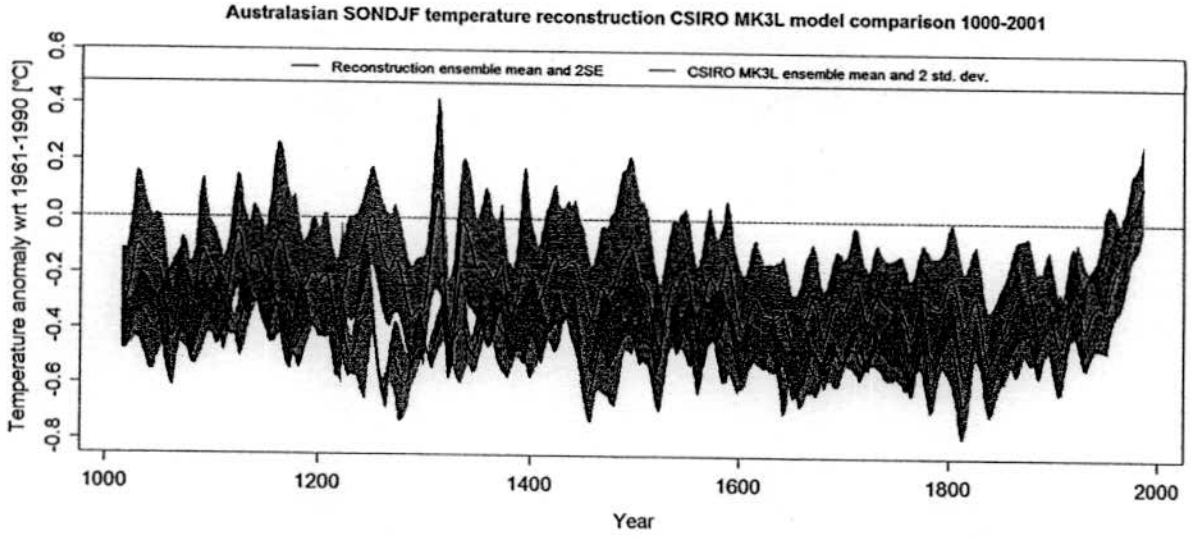


Figure 4. Australasian September–February mean temperature reconstruction, A.D. 1000–2001. Solid line represents the 30-year filtered ensemble mean reconstruction based on multivariate principal component regression performed on a 3000-member ensemble. The 2SE combined ensemble and calibration uncertainties are denoted by grey shading. Most reliable periods of the reconstruction (as determined by eight reconstruction skill and stability metrics) are shown by solid black line with less reliability indicated by the thin black line. Instrumental HADCRUT3v combined land and ocean temperature data over the 1900–2009 period shown in green. All anomalies are calculated relative to a 1961–1990 base period.

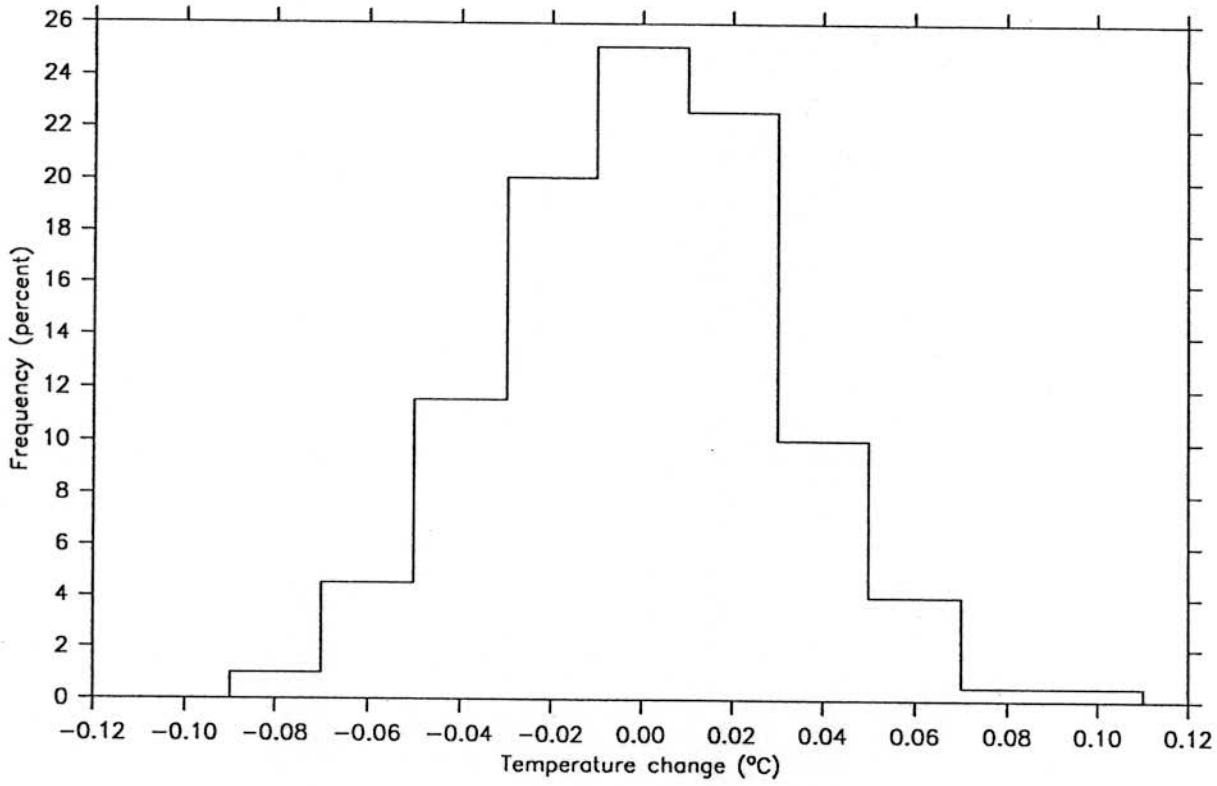


1102
1103 **Figure 5**. Comparison of the Australasian SONDJF ensemble mean temperature reconstruction
1104 (solid black line) with solar grand minima (pink shading) and the Southern Hemisphere component
1105 of Gao *et al.*'s (2008) global volcanic sulphate aerosol injection dataset (blue). The 2SE combined
1106 ensemble and calibration reconstruction uncertainties are denoted by grey shading.
1107



1107

1108 **Figure 6.** Comparison of the 30 year filtered Australasian SONDJF ensemble mean temperature
1109 reconstruction (solid black line) with the ensemble mean of three model simulations derived from
1110 the CSIRO Mk3L model developed by Phipps *et al.* (2011). The 2SE combined ensemble and
1111 calibration reconstruction uncertainties are denoted by grey shading. All anomalies are calculated
1112 relative to a 1961–1990 base period.



1113 **Figure 7**. The distribution of the changes in Australasian mean SONDJF temperature between
1114 consecutive non-overlapping 50-year periods of a 10,000-year pre-industrial control simulation.
1115

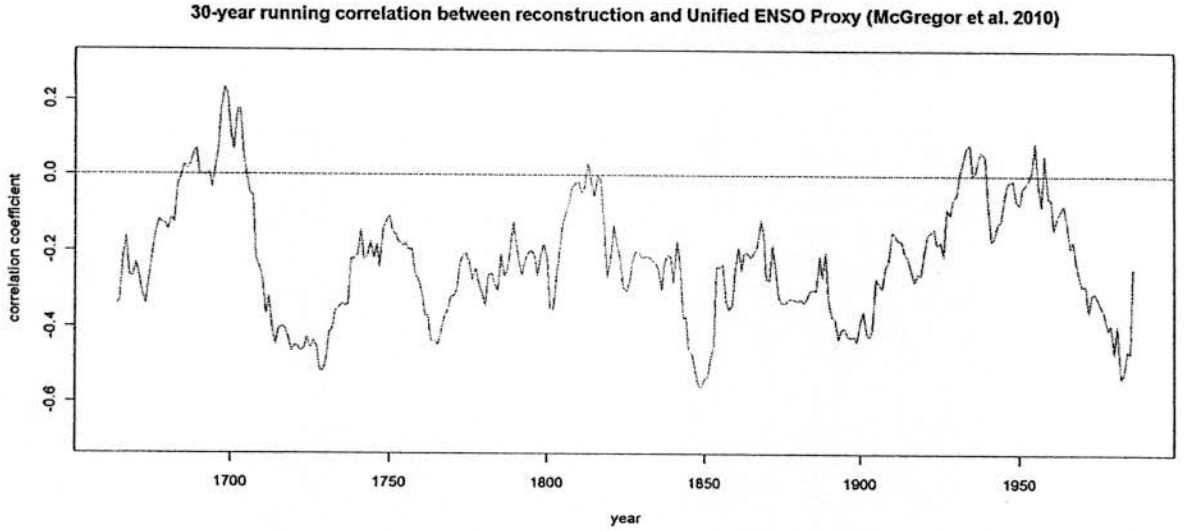


Figure 8. 30-year running correlation between the R27 Australasian temperature reconstruction and a modified version of the McGregor *et al.* (2010) Unified ENSO Proxy (UEP) which excludes Australasian proxies used in the Braganza *et al.* (2009) study. Note that negative UEP values correspond to La Niña-like conditions and vice versa.

Supplementary material for Evidence of unusual late 20th century warming from an Australasian temperature reconstruction spanning the last millennium

Joëlle Gergis[1], Raphael Neukom[1], Steven Phipps[2,3], Ailie Gallant[1], David Karoly[1]

and PAGES Aus2K Project Members†

[1] School of Earth Sciences, University of Melbourne, Australia

[2] Climate Change Research Centre, University of New South Wales, Sydney, Australia

[3]ARC Centre of Excellence for Climate System Science, University of New South Wales, Sydney, Australia

Corresponding author

Dr Joëlle Gergis

School of Earth Sciences

University of Melbourne,

VIC 3010, AUSTRALIA

Ph: +61 3 834 49868

Fax: +61 3 834 47761

Mobile: + 61 415 449 241

Email: jgergis@unimelb.edu.au

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Supplementary material

S1. Coherence of Australasian tmperature

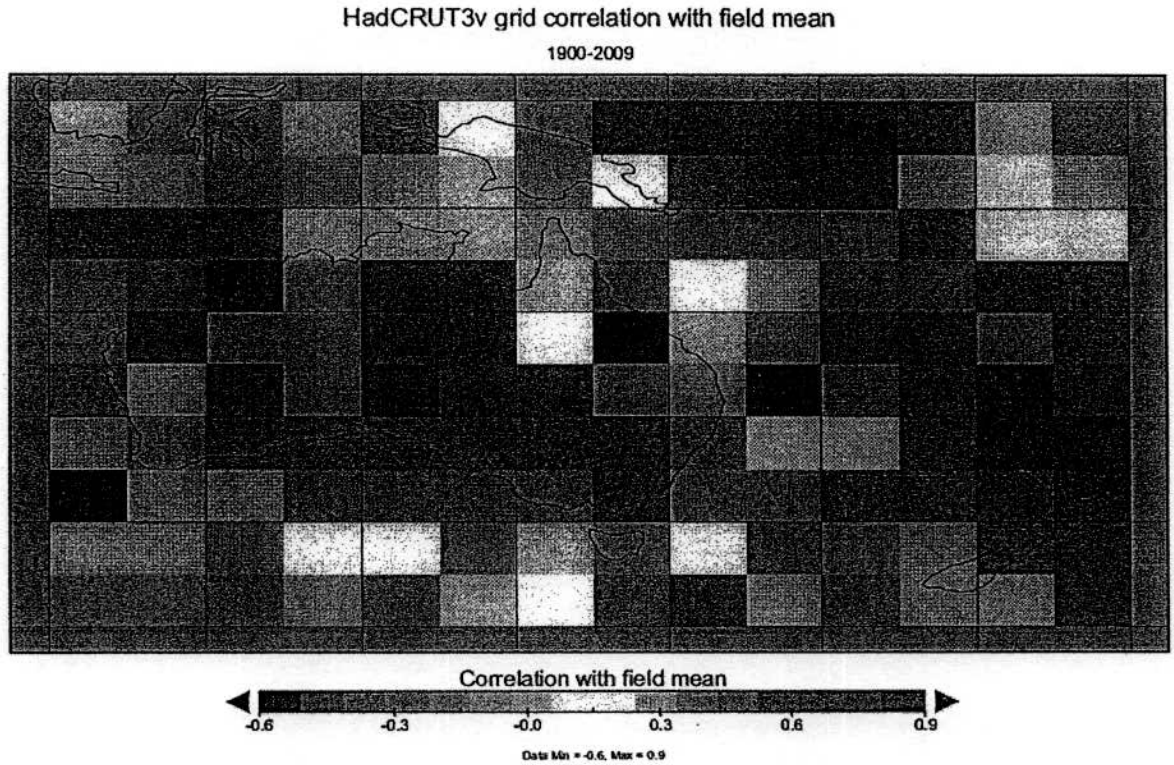


Figure S1. Correlation of the Australasian HadCRUT3v grid cells with the spatial mean of the target domain (110°E–180°E, 0°–50°S) over the 1900–2009 period. Grid cells in Western Australia contain missing values are shaded grey.

S2. Proxy nest (subset) reconstructions and ensemble parameters

Table S2.1. Verification metrics for R27, R21, R14 and R3 proxy subsets, 1900–2009.

Nest	Ensemble median RE	Early verification RE	Residual SD	Residual SD (30-year filtered)	Ensemble mean RMSE
R28 (all proxies)	0.50	0.72	0.15	0.07	0.12
R21 (pre 1801 proxies)	0.48	0.69	0.15	0.07	0.12
R14 (pre 1701 proxies)	0.38	0.64	0.16	0.08	0.13
R4 (pre 1457 proxies)	0.14	0.62	0.19	0.08	0.17

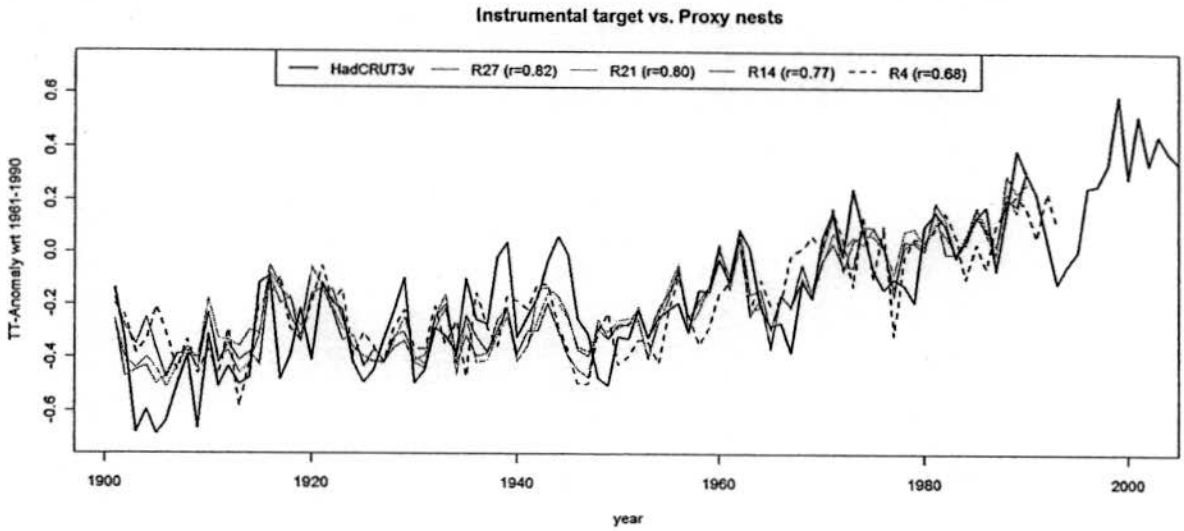


Figure S 2.1. Comparison of R27 (red), R21 (green), R14 (blue) and R4 (red dashed) networks with HadCRUT3v Australasian SONDJF mean (black), 1900–2009. Correlations of each proxy network with observed HadCRUT3v temperatures are bracketed.

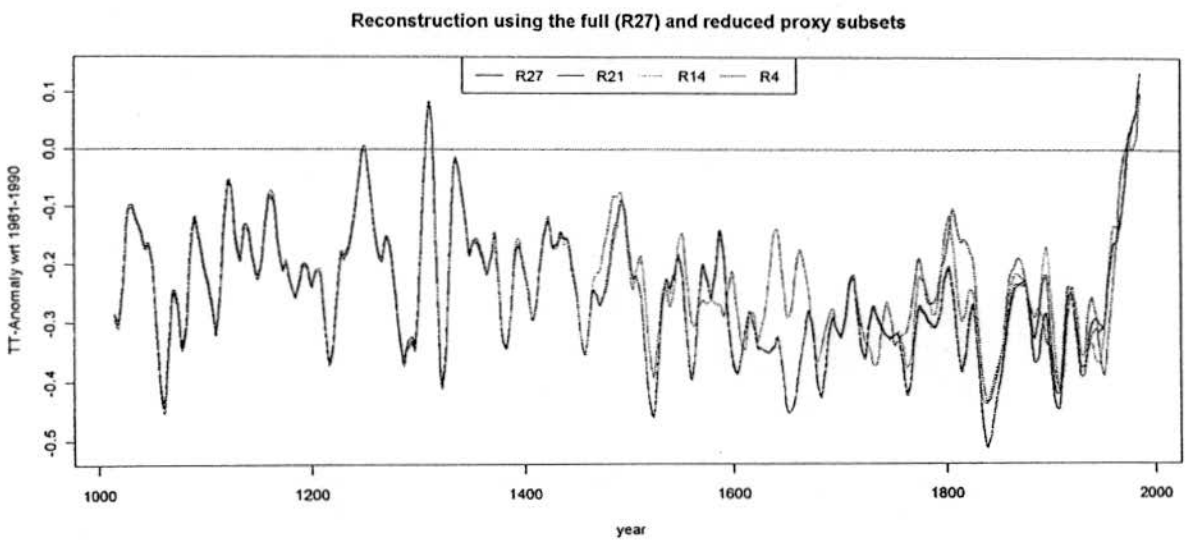
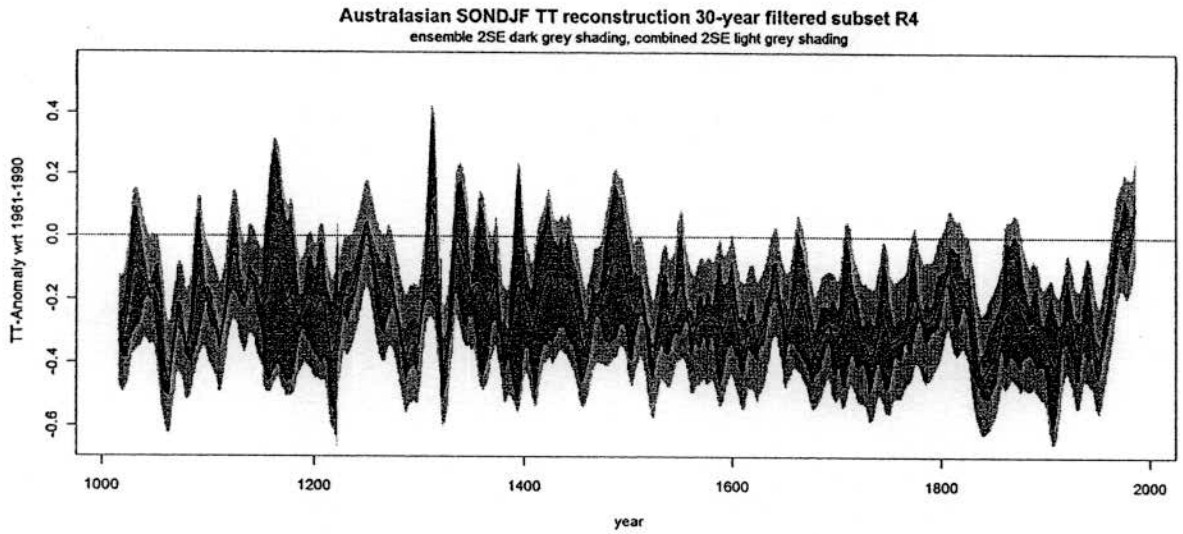


Figure S 2.2. Comparison of R27 (black), R21 (red), R14 (green) and R4 (blue) 30-year filtered reconstructions, A.D. 1000–2001.



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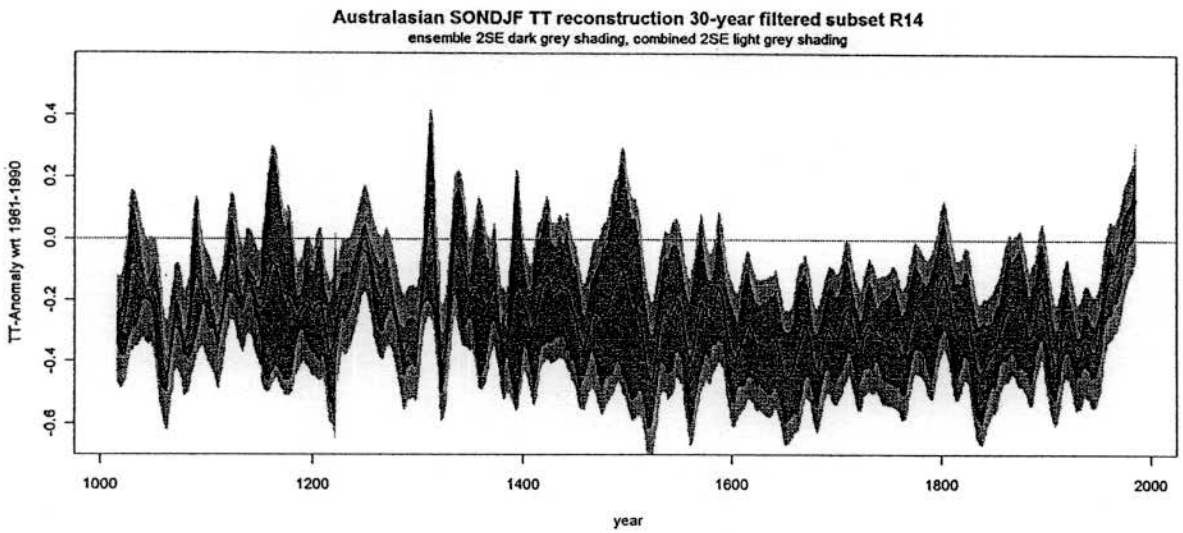

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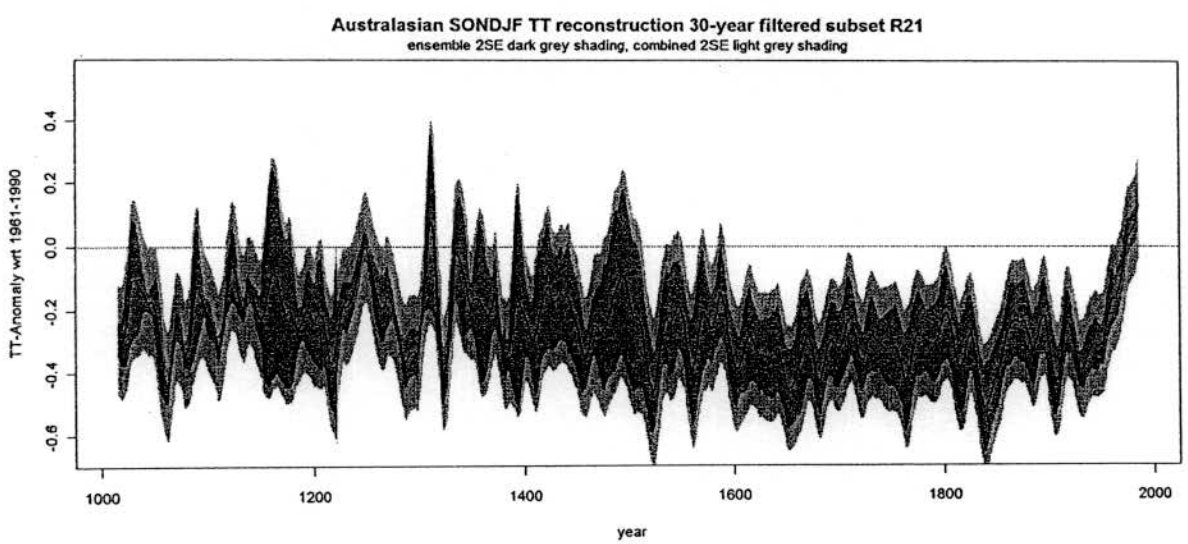
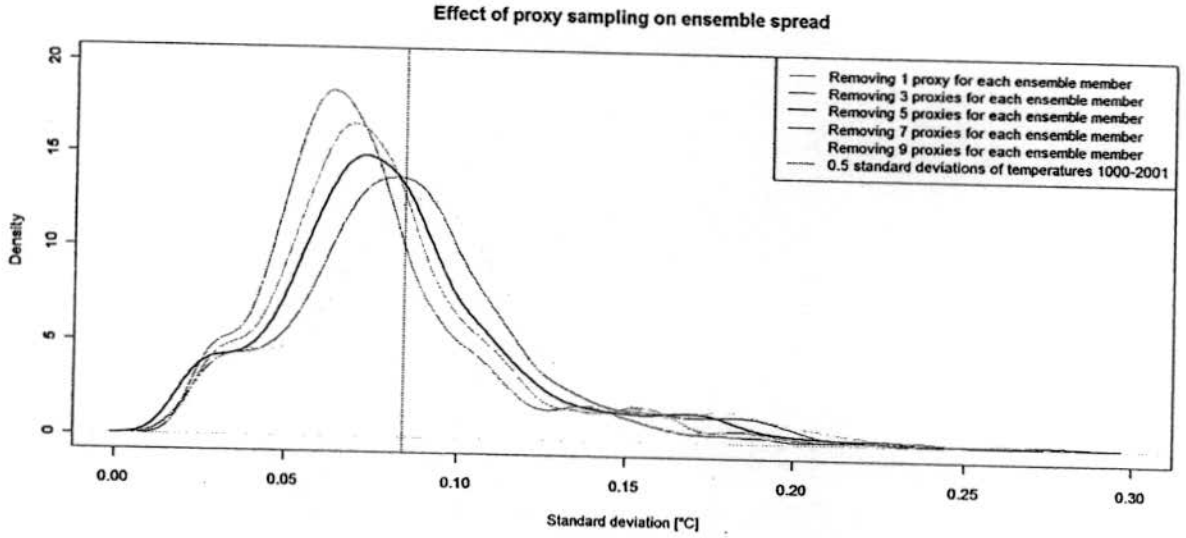
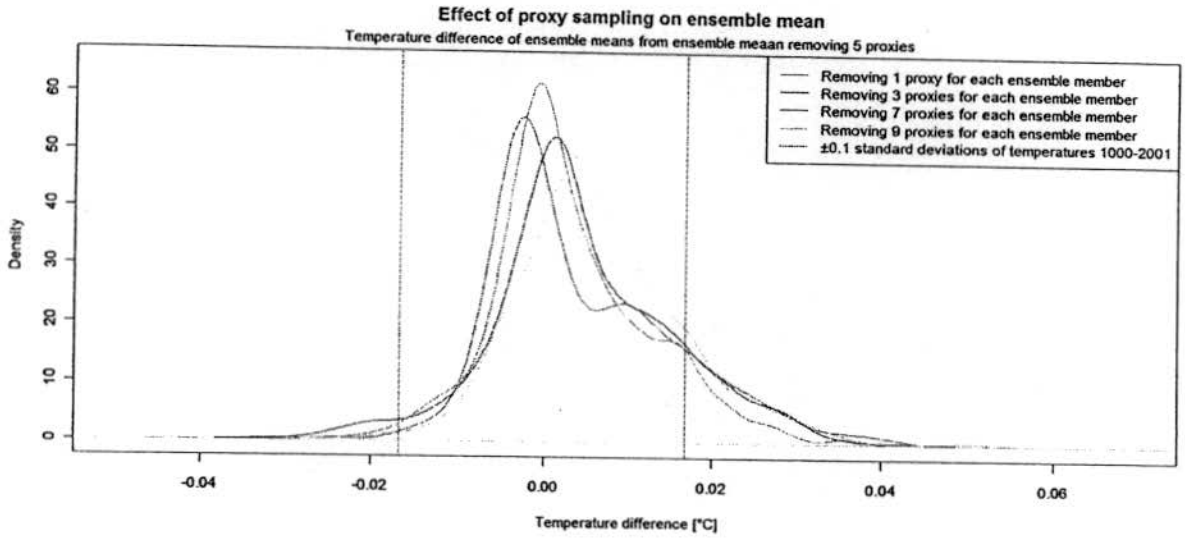


1166
1167 **Figure S2.3**. R4 (pre-1457 proxies), R14 (pre-1701 proxies) and R21 (pre1801) subset
1168 reconstructions (black) with 95% combined ensemble and calibration uncertainties (grey shading).



1169

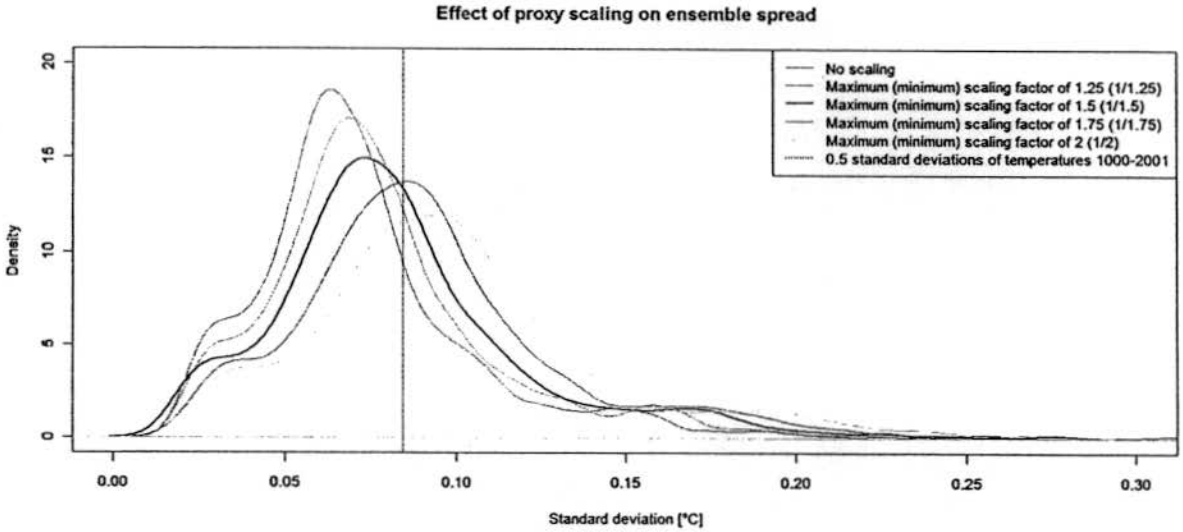
1170 **Figure S2.4**. Effect of proxy sampling on the ensemble spread (details see section 2.3 in the main
1171 text). Distribution of the standard deviations between reconstruction ensemble members 1000–2001
1172 based on different sampling parameters. Solid black: Results from a reconstruction removing five
1173 predictors from the proxy set for each ensemble member. This parameter was used in the
1174 reconstructions presented herein. Red, green blue and light blue: Results after removing one, three,
1175 seven and nine predictor for each member, respectively. The dashed vertical line shows represents
1176 0.5 standard deviations of the reconstruction median 1000–2001 (which is not sensitive to proxy
1177 sampling (Figure S2.5)).



1178

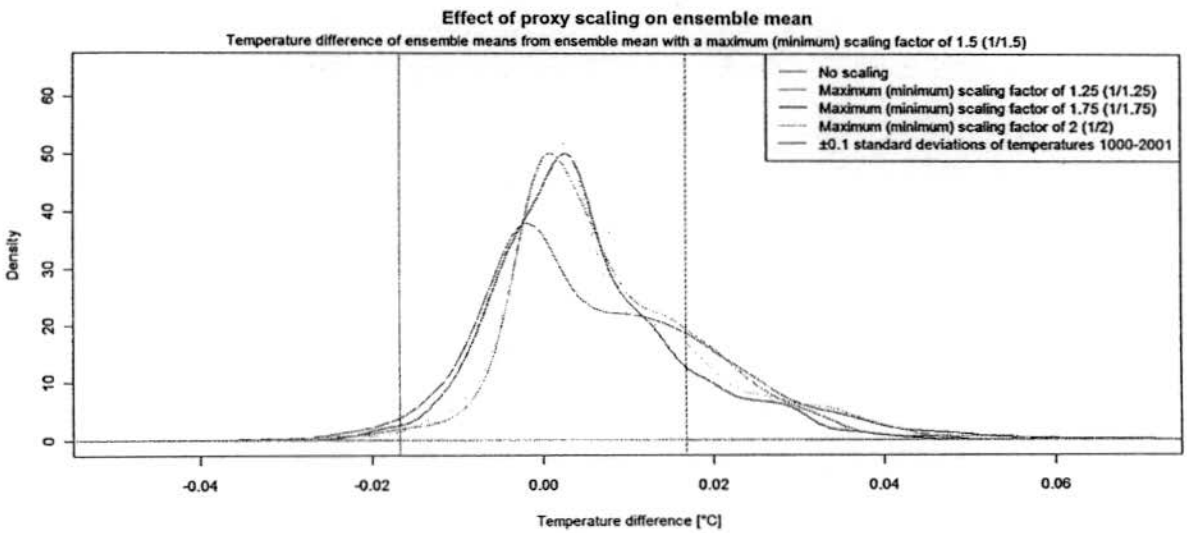
1179 **Figure S2.5.** Effect of proxy sampling on the reconstruction ensemble mean. Distributions of the
1180 difference between the ensemble mean (removing five proxies from for each member) and the
1181 ensemble mean removing one (red), three (green), seven (blue) and nine (light blue) proxies over

1182 the period 1000-2001. The dashed vertical line shows represents ±0.1 standard deviations of the
1183 reconstruction median 1000-2001 (removing five proxies from each member).



1184

1185 **Figure S2.6.** Effect of proxy scaling factors on the ensemble spread. Same as Figure S2.4 but with
1186 varying weighting factors for each proxy record in the PC analysis.

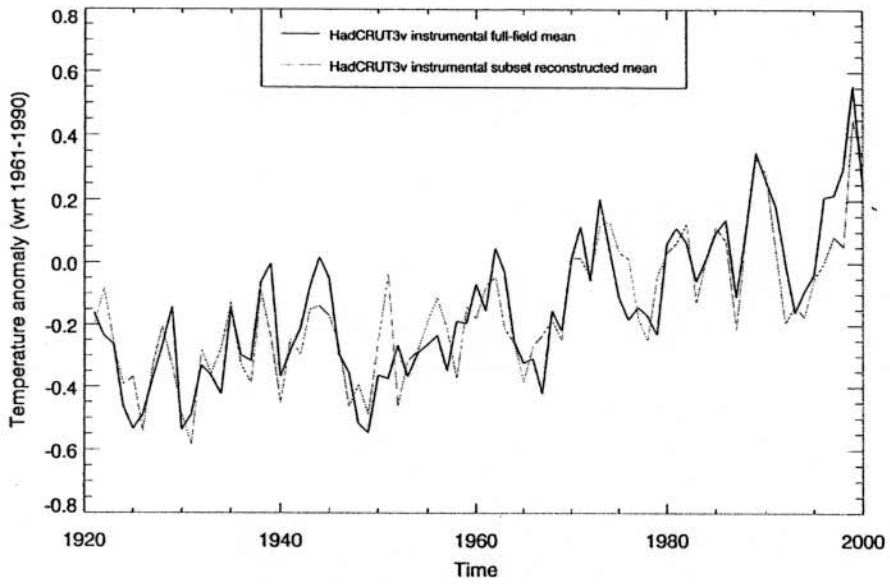


1187

1188 **Figure S2.7**. Effect of proxy scaling factors on the reconstruction ensemble mean. Same as Figure
1189 S2.5 but with varying weighting factors for each proxy record in the PC analysis.

1190

S3. Pseudo instrumental verification



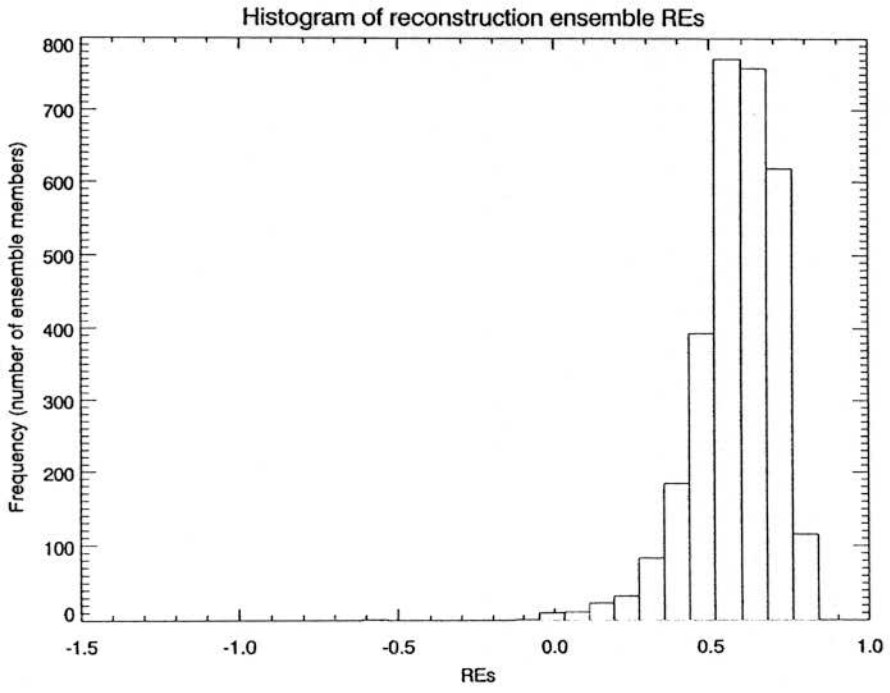
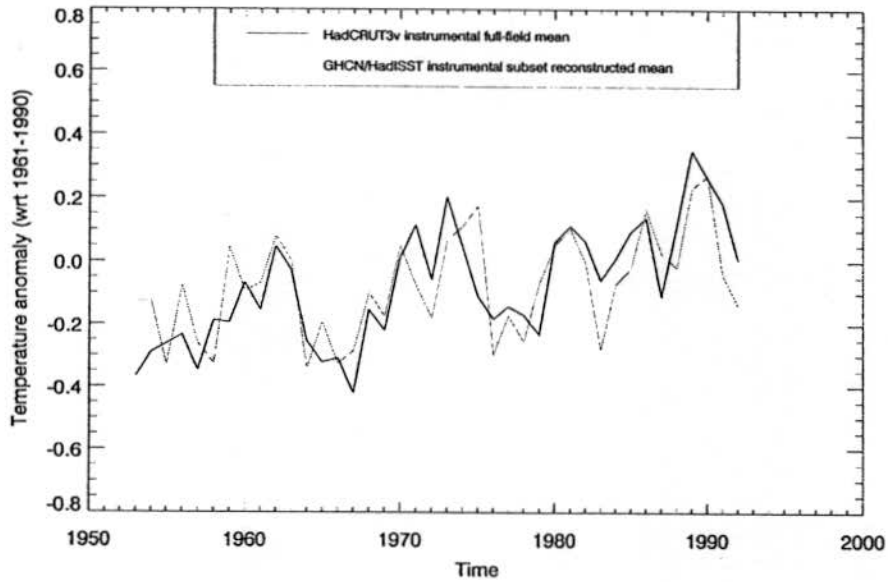


Figure S3.1. Instrumental verification using HadCRUT3v grid points from R27 palaeoclimate record locations (top). Histogram of mean RE values for 3000-member ensemble (below).



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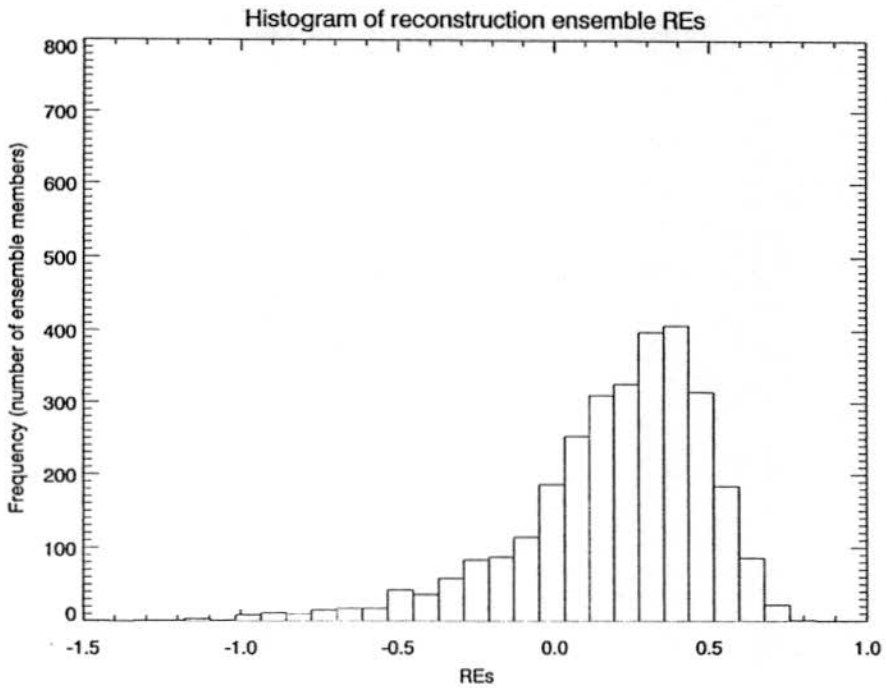
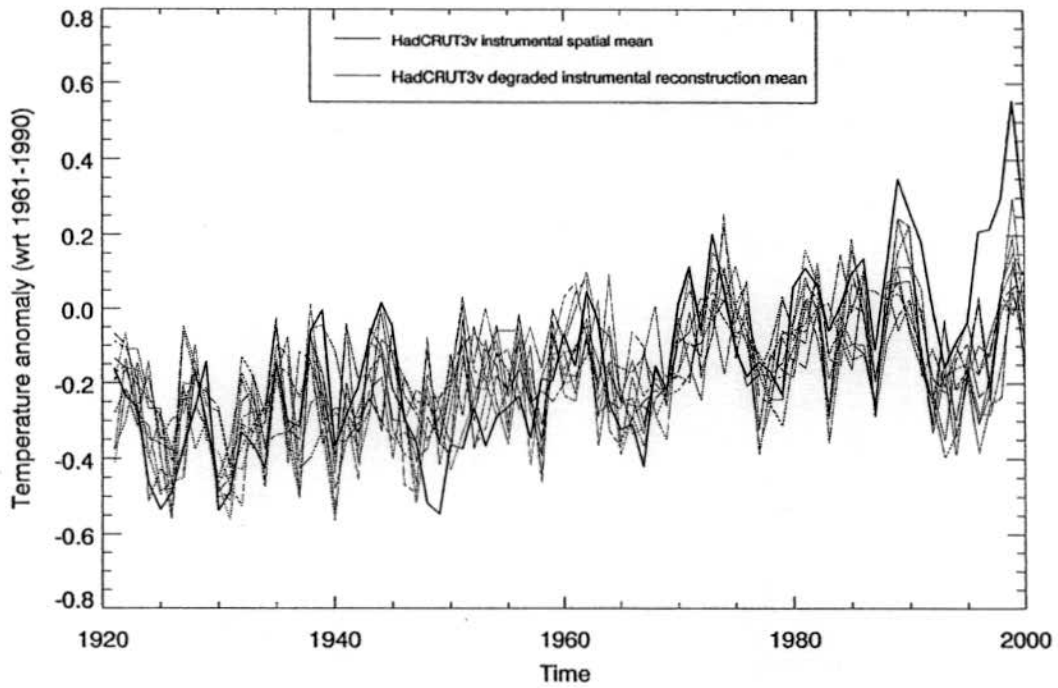


1197

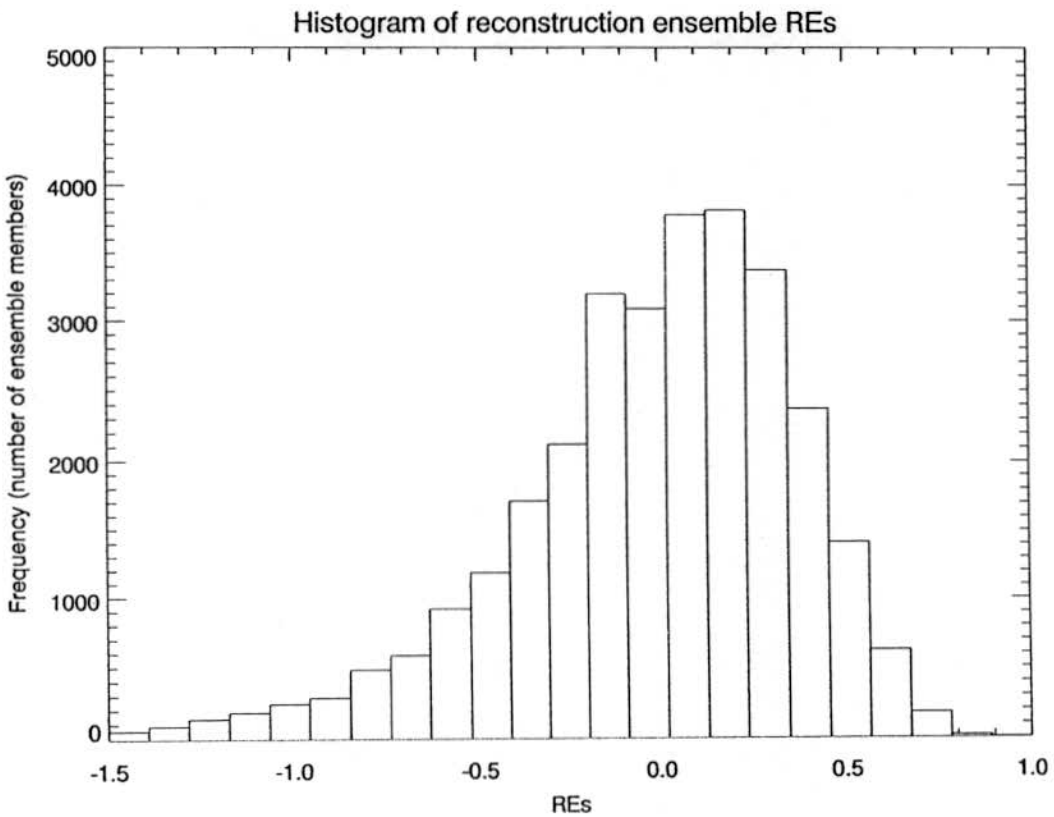
1198

1199 **Figure S3.2**. Instrumental verification using GHCN stations from R27 palaeoclimate record

1200 locations (top). Histogram of mean RE values for 3000-member ensemble (below).



1201



1202

1203 **Figure S3.3**. Pseudo proxy experiment based on ten noise reconstructions (top) and combined

1204 histogram of mean RE values derived from ten, 3000-member ensembles (below).

1205

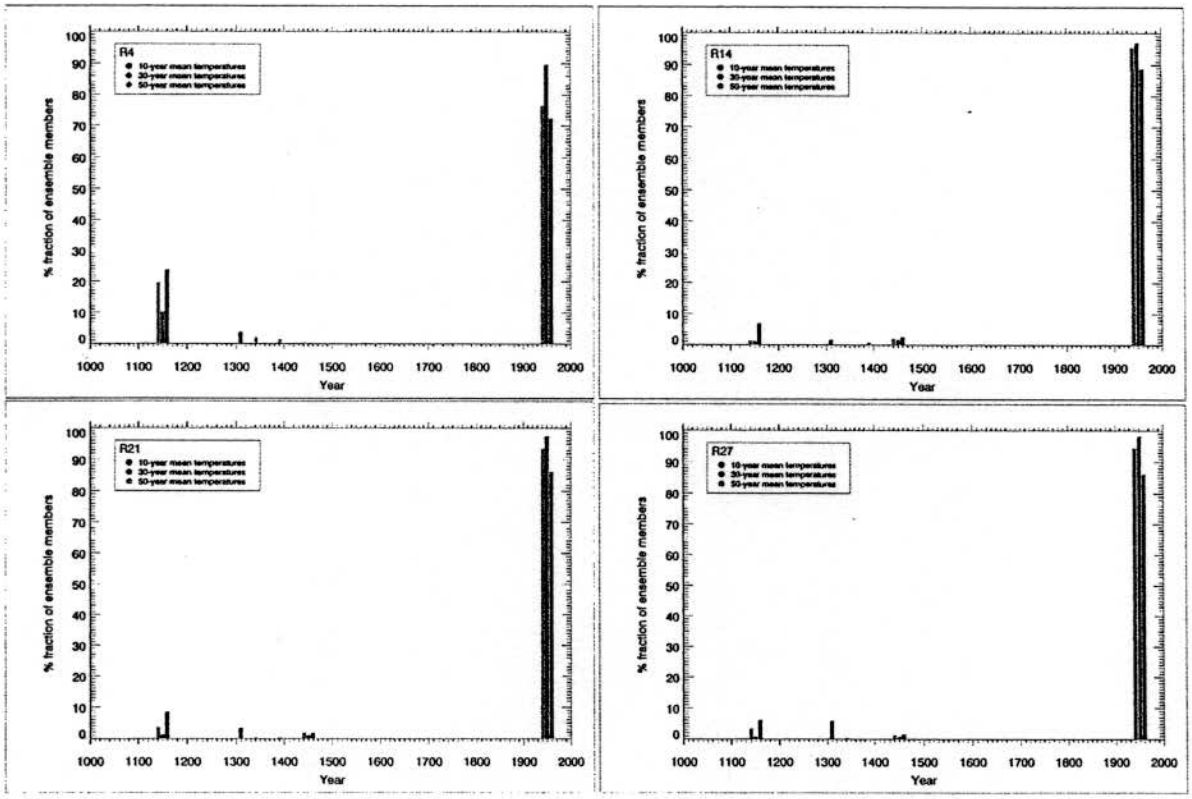


Figure S3.4. Histograms of the times at which the hottest reconstructed 10-year (black), 30-year (middle grey) and 50-year (light grey) periods occurred for each ensemble member and the fraction of 3000 ensemble members for which this occurred. Results are shown for the R27 suite of proxies (lower right) and the sub-nests of R4 (upper left), R14 (upper right) and R21 (lower left).

1212 **Table S3.1**. The percentage of ensemble members (n = 3000) of reconstructed Australasian mean
1213 temperature where the hottest 10-year, 30-year and 50-year period occurred after 1950. Percentage
1214 values are shown for the R4, R14, R21 and R27 networks of the temperature proxy locations.

	R4	**R14**	**R21**	**R27**
10-year period	72.5%	88.8%	86.2%	86.2%
30-year period	89.7%	97.0%	97.5%	98.3%
50-year period	76.4%	95.5%	93.5%	94.5%

1215

S4. CSIRO Mk3L model comparisons

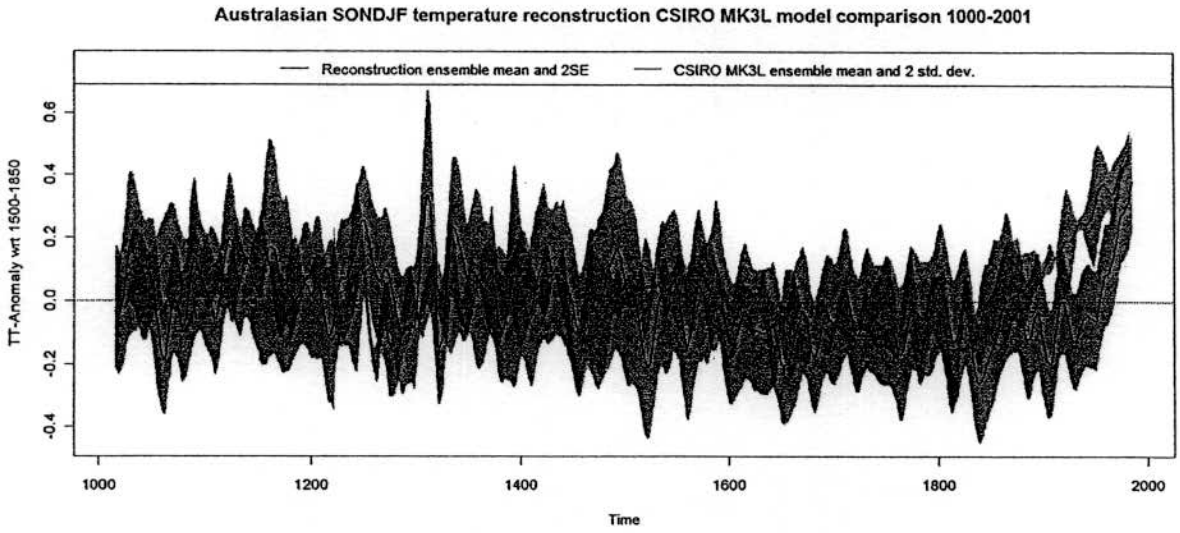
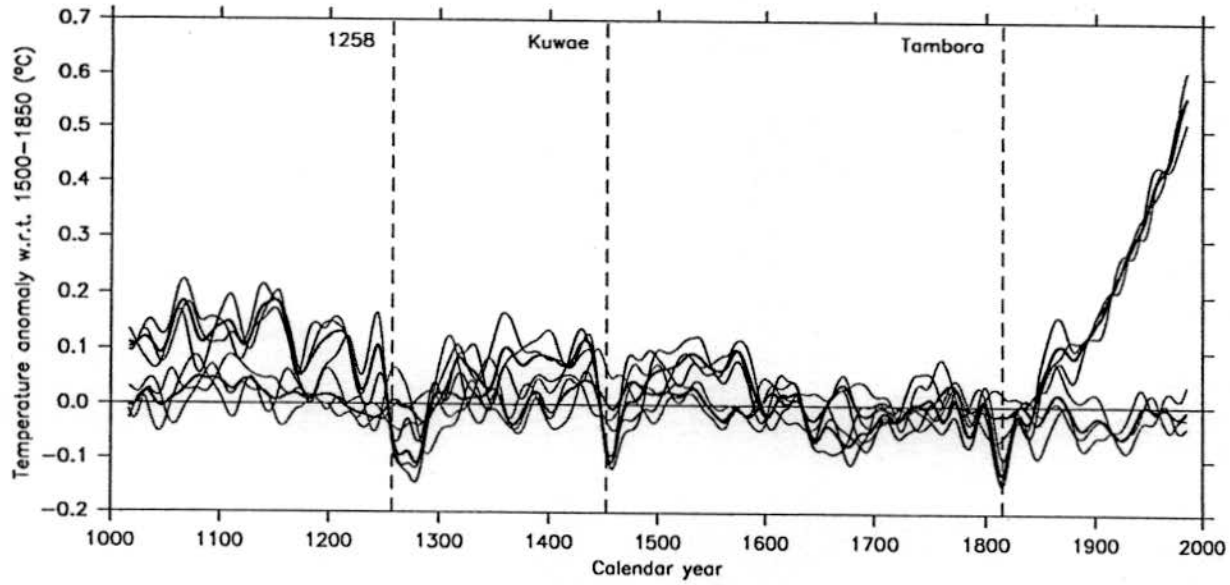


Figure S4.1. Comparison of the 30 year filtered Australasian SONDJF ensemble mean temperature reconstruction (solid black line) with three member ensemble mean simulations (blue) and associated 2SD uncertainties derived from the CSIRO Mk3L model developed by Phipps *et al.* (2011). The 95% combined reconstruction ensemble and calibration reconstruction uncertainties are shaded grey. All anomalies are calculated relative to a 1500–1850 base period, contrasting to Figure 6 that shows anomalies relative to a 1961–1990 base period.



1223 **Figure S4.2**. Forced (blue) and unforced (red) simulations of Australasian mean SONDJF
1224 temperature for the period AD 1001-2000. The unforced data represents three independent 1000-
1225 year sections of a 10,000-year pre-industrial control simulation. The forced data represents a three-
1226 member ensemble of transient simulations, forced with changes in the Earth's orbital parameters,
1227 atmospheric greenhouse gas concentrations, total solar irradiance and volcanic sulphate aerosols.
1228 Thin lines represent individual ensemble members and thick lines the ensemble mean. A 31-year
1229 Hanning smoother is applied. Vertical dashed lines indicate the Kuwae (AD 1452) and Tambora
1230 (AD 1815) volcanic eruptions, as well as the unknown eruption of AD 1258.

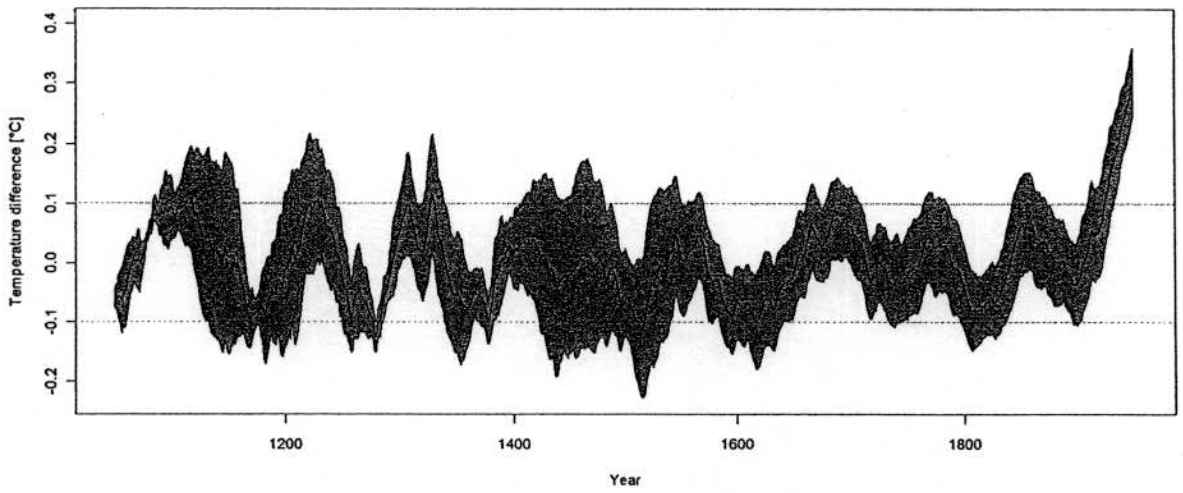
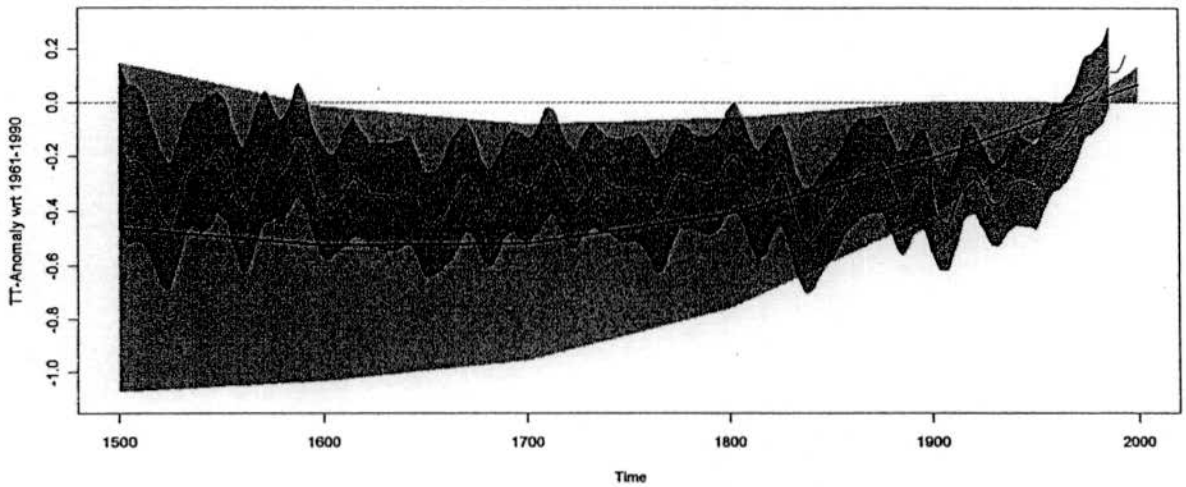


Figure S4.3. Reconstructed temperature differences between consecutive 50-year periods. Black: ensemble mean (centred on the last year of the first 50-year period). Grey shading: Ensemble 2 standard deviation uncertainty bands. Dashed horizontal red lines: Maximum and minimum differences in a 10,000-year pre-industrial control simulation using CSIRO Mk3L (Figure 8) represent the bounds of natural variability.

1237 **S5. Australasian SONDJF temperature reconstruction vs. Australian borehole temperatures**



1238

1239 **Figure S5**. Comparison between the 30-year loess filtered Australasian SONDJF ensemble mean
1240 temperature reconstruction (black) with 2SE uncertainties (grey shading) and Pollack *et al.*'s
1241 (2006) low frequency Australian borehole temperature reconstruction (red) and associated 2SE
1242 uncertainties (pink shading) from AD 1500 onward. 30-year loess filtered HadCRUT3v
1243 Australasian spatial mean (green) also shown over the 1901–1994 period.

1244

S6. Temperature reconstruction 'reliability' measures

Table S6: Name and description of the eight measures that were used to assess the reliability of the reconstruction. For further details see Neukom *et al.* (in prep).

Skill measures

No.	Name	Details
1	RE	Ensemble median RE is higher than the ensemble median RE of a reconstruction using AR(1) noise proxies
2	RMSE	RMSE of the ensemble mean is smaller than the RMSE of the ensemble mean of a reconstruction using AR(1) noise proxies

Robustness measures

No.	Name	Details
3	Nests - decadal	Final reconstruction is similar to the reconstruction of each proxy-nest. We calculate the ensemble mean of each nest over all years with data available, not only the time slice that is represented by the nest. If this mean similar to the full ensemble mean (both 30-year filtered) over the years that are *not* represented by the nest, then the years that *are* represented by the nest are considered robust.
4	Nests - interannual	Same as no. 3 but comparing the 50-year running standard deviation of the unfiltered reconstructions (nests vs. final reconstruction)
5	Proxies - decadal	Final reconstruction is similar to the reconstruction after removing each proxy individually. The 30-year filtered mean of the full ensemble is compared to the 30-year filtered mean of all members, where a given proxy has been removed from the proxy set. Each year, where the two reconstructions are similar for all 27 proxies to be removed, is considered robust.
6	Proxies - interannual	Same as no. 5 but comparing the 50-year running standard deviation of the unfiltered reconstructions (removed proxies vs. final reconstruction)
7	Ensemble members - decadal	Final reconstruction (30-year filtered) is similar to the mean of only the ensemble members with RE>0 (30-year filtered)
8	Ensemble members - interannual	Same as no. 5 but comparing the 50-year running standard deviation of the unfiltered reconstructions (members with RE>0 only vs. Final reconstruction)

S7. Underestimation of reconstructed temperature after 1995

In the years 1996–2001 reconstructed temperatures are consistently lower than instrumental data (Figure 2). However, this difference is not caused by the proxy records' inability to register exceptionally warm temperatures (a phenomenon called 'divergence' in the literature, see e.g. Esper and Frank, 2009) for the following reasons:

1. 'Unequal attention': Esper and Frank (2009) provide a number of possibilities to incorrectly detect a divergence problem. Our case is an example of 'unequal attention' (see their Figure 1i), where differences between reconstructed and instrumental temperatures of similar magnitude occur also in other years during the overlap period. In our case, there is also an underestimation of instrumental temperatures around 1940, a rather cool phase. Hence, the difference at the end of the reconstruction is very likely to be a 'normal' calibration issue unrelated to the particularly warm instrumental temperatures over the 1996–2001 period.
2. Sub-regional temperature variations: During 1996-2001 the number of proxies available is already relatively low (between 11 in 1996 and 4 in 2001, see Table 1). The most important candidates for a divergence problem are the two tree ring records Mt Read and Oroko, which both cover the full reconstruction period. Figure S7.1 shows a variation of Figure 2 using these two proxies only (red curve). An alternative reconstruction is provided using the instrumental data that correspond to these two tree ring records (Cook et al. 2006) as predictors (green curve). The apparent discrepancy remains practically unchanged if instrumental predictors are used. Hence, the difference between our reconstruction and the instrumental target is likely to stem from differences between sub-regional temperatures (from New Zealand and Tasmania) and the Australasian temperature mean during this period. The relationship between the tree ring data and local temperatures remains robust during this period.
3. Uncertainties: As shown in Figure 2, instrumental temperatures are well within the uncertainty range of our reconstruction during warm years, except for the years 1997 and 2001.

While these factors explain that differences in reconstructed and instrumental temperatures are not due to 'divergence', they also show that proxy based reconstructions are not perfect and local temperatures may not always be representative for large-scale fluctuations. Despite these differences, Figures 3, 4 and S1 and Sections S2 and S3 show that our results represent a skilful reconstruction of Australasian temperatures over the 1000–2001 period.

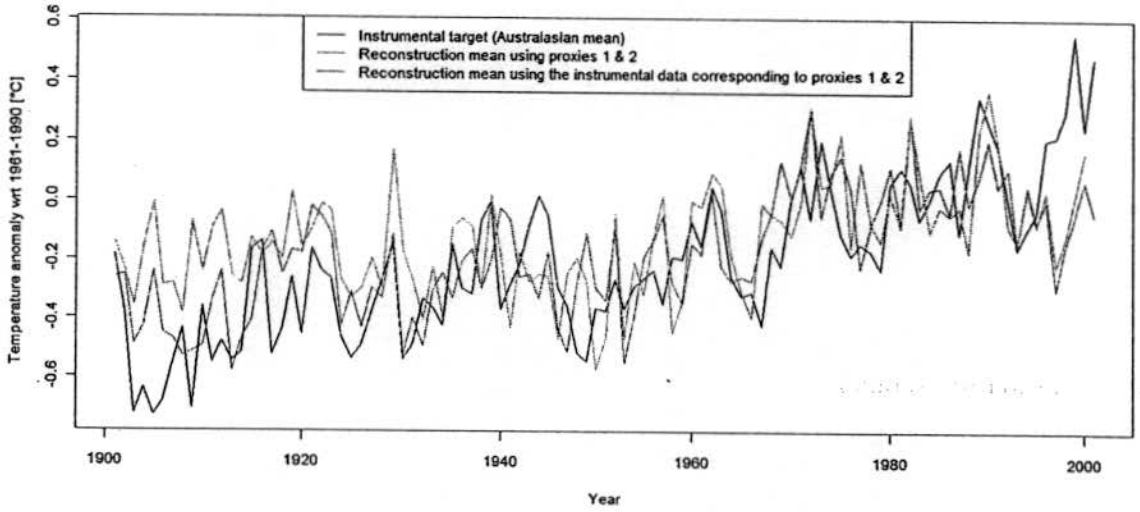


Figure S7.1. Black: Instrumental target data 1900-2001. Red: Reconstruction ensemble median using only proxies 1 and 2 (see Table 1) as predictors. Green: Same as red but using the corresponding instrumental temperature station data as proxies (see Cook *et al.* 2006 for data description.)

S8. Solar, volcanic and anthropogenic forcing

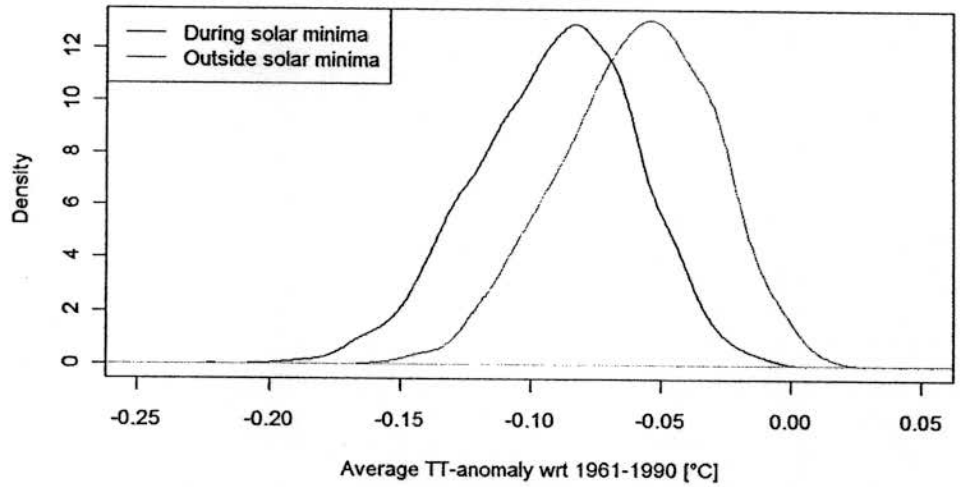


Figure S8.1. Black: ensemble distribution of the average 30-year loess filtered temperature anomalies during solar minima: Oort (1040–1080), Wolf (1280–1350), Spörer (1460–1550), Maunder (1645–1715), and Dalton Minimum (1790–1820). Red: Same as black but for the remaining years of the 1000–1850 period.

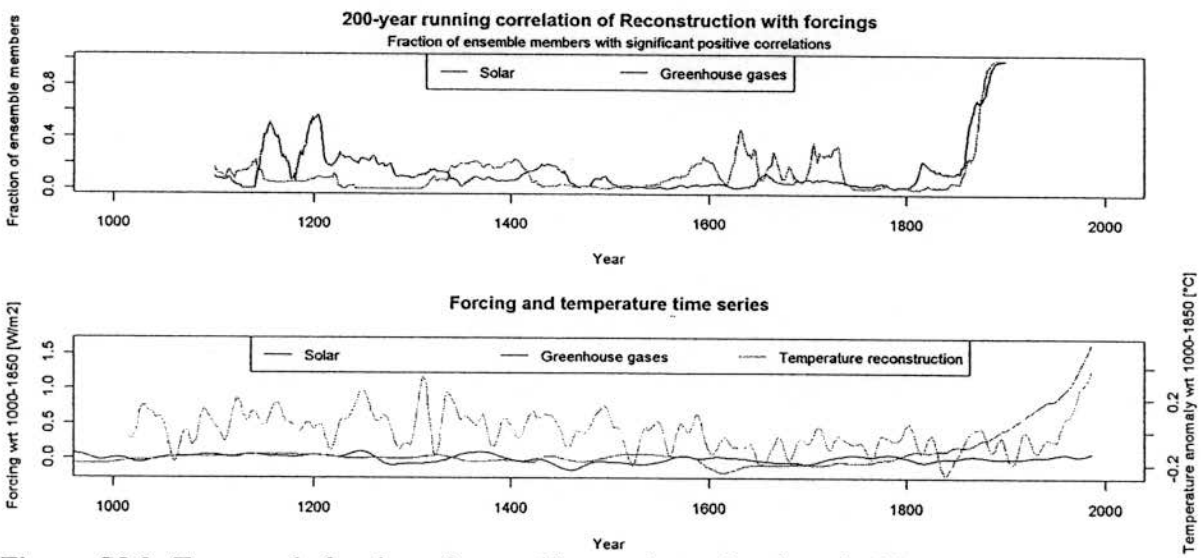


Figure S8.2. Top panel: fraction of ensemble members showing significant ($p<0.05$) positive 200-year running correlation of the 30-year filtered reconstruction with solar forcing (Steinhilber *et al.*, 2009) (black) and greenhouse gas concentrations (MacFarling–Meure *et al.*, 2006) (red). Bottom panel: Absolute values of solar (black) and greenhouse gas (red) radiative

forcing (W/m^2) and our ensemble mean reconstruction (green) expressed relative to a 1000–1850 pre-industrial base period.

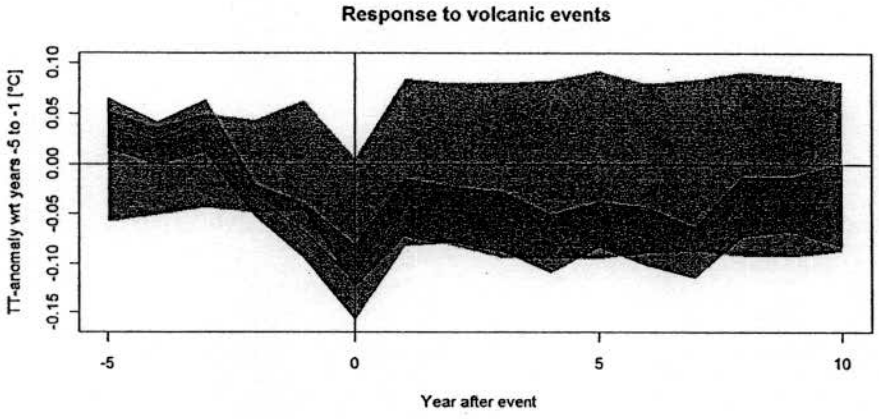
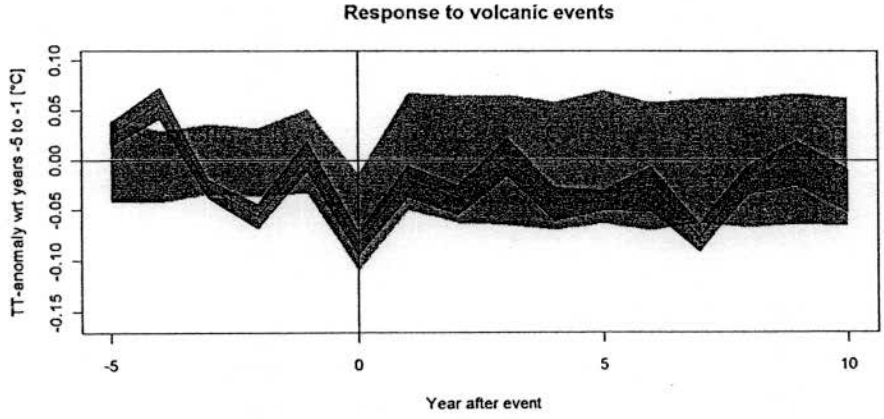
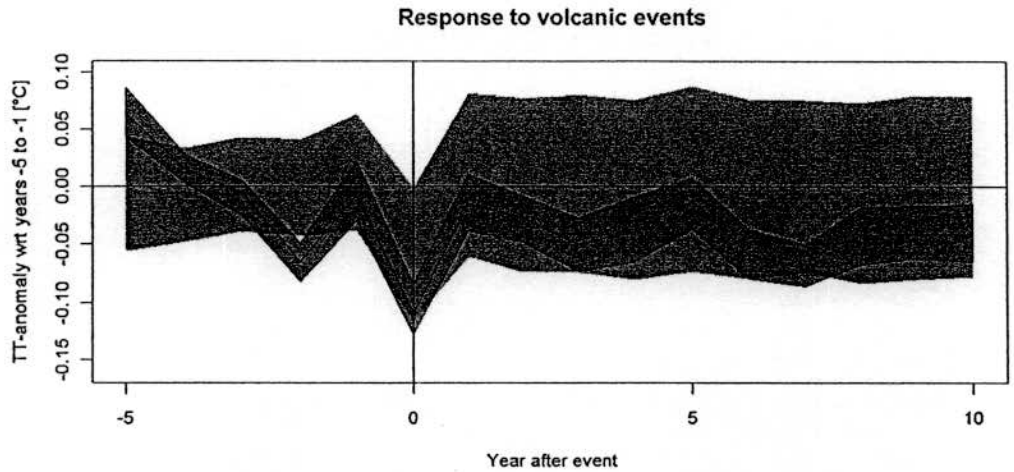


Figure S8.3. Superimposed epoch analysis showing the response of reconstructed temperatures to volcanic forcing given by Crowley *et al.* (2008). The 33% largest eruptions exceeding a reconstructed forcing of -0.5 W/m^2 are used (11 events). Black: Median temperatures of the ensemble mean between 5 years before and 10 after the eruption (expressed as anomalies relative to the average of the five years preceding the eruption). Uncertainty estimates represent bootstrapped re-sampling of the medians. The red shaded area represents the 95% confidence interval of 1000 iterations of calculating the median of 11 random non-volcanic events. We selected the coldest of the years 0 and +1 after the eruption as the "response year" (year "0" in the plot) to allow for dating uncertainties or eruptions that take place late in the year.



1308 **Figure S8.4.** Same as Figure S8.3 but using the Crowley *et al.* (2000) volcanic forcing dataset

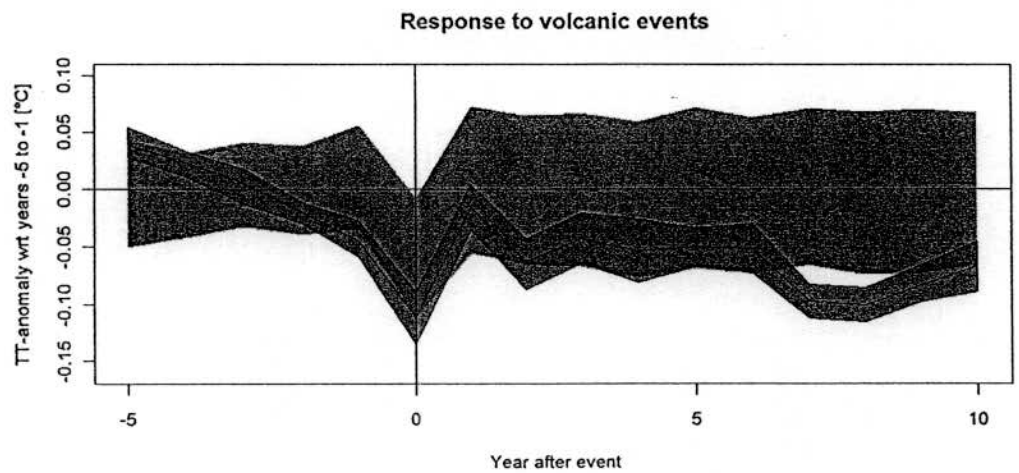
1309 with 19 events selected.



1310

1311 **Figure S8.5.** Same as Figure S8.3 but using the volcanic forcing dataset of Gao *et al.* (2008) global

1312 forcing with 13 events selected.



1313

1314 **Figure S8.6.** Same as Figure S8.3 but using the volcanic forcing dataset of Gao *et al.* (2008)

1315 Southern Hemisphere forcing with 17 events selected.

38

Re: Statement in response

Joelle Gergis
Sent:08 June 2012 16:17
To: David John Karoly

Publication of scientific study put on hold

Publication of a recent scientific study on temperature variations in Australasia over the last thousand years has been delayed. The study, 'Evidence of unusual late 20th century warming from an Australasian temperature reconstruction spanning the last millennium' by Joelle Gergis, Raphael Neukom, Stephen Phipps, Ailie Gallant and David Karoly, was recently accepted for publication in the *Journal of Climate*. An issue has been identified in the processing of the data used in the study, which may affect the results.

While the paper states that "both proxy climate and instrumental data were linearly detrended over the 1921–1990 period", it was discovered on Tuesday 5 June that the records used in the final analysis were not detrended for proxy selection, making this statement incorrect. Although this is an unfortunate data processing issue, it is likely to have implications for the results reported in the study. The journal has been contacted and the publication of the study has been put on hold.

This is a normal part of science. The testing of scientific studies through independent analysis of data and methods strengthens the conclusions. In this study, an issue has been identified and the results are being re-checked.

On 8/06/12 3:57 PM, "David Karoly" <dkaroly@unimelb.edu.au> wrote:

> Draft statement is attached, David
>
> ~~~~~~
> **Prof David Karoly**
> School of Earth Sciences
> University of Melbourne, VIC 3010, AUSTRALIA
> ph: +61 3 8344 4698
> fax: +61 3 8344 7761
> email: dkaroly@unimelb.edu.au
> http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
> <http://www.earthsci.unimelb.edu.au/%7Edkaroly/wp/>
> ~~~~~~

39

RE: Climate blog discussion

David John Karoly

Sent: 08 June 2012 16:40
To: John Dubois; Diane Squires; Rebecca Scott; Joelle Gergis

Hi John and Rebecca,

Below is our suggested statement in response to the climate change blog discussion.

Your comments are welcome. We would like to send this to the blog site this evening, to be seen to be proactive in dealing with this. We do not want to do anything more until we meet on Tuesday morning. After that meeting, we will need to contact the federal Dept of Climate Change and Energy Efficiency, as they funded the study. We will also need to advise the Australian Science Media Centre, as they facilitated the media conference when this study was accepted for publication in mid-May.

Best wishes, David

~~~~~~
Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
~~~~~~

Publication of scientific study put on hold

Publication of a recent scientific study on temperature variations in Australasia over the last thousand years has been delayed. The study, 'Evidence of unusual late 20th century warming from an Australasian temperature reconstruction spanning the last millennium' by Joelle Gergis, Raphael Neukom, Stephen Phipps, Ailie Gallant and David Karoly, was recently accepted for publication in the Journal of Climate. An issue has been identified in the processing of the data used in the study, which may affect the results.

While the paper states that "both proxy climate and instrumental data were linearly detrended over the 1921–1990 period", it was discovered on Tuesday 5 June that the records used in the final analysis were not detrended for proxy selection, making this statement incorrect. Although this is an unfortunate data processing issue, it is likely to have implications for the results reported in the study. The journal has been contacted and the publication of the study has been put on hold.

This is a normal part of science. The testing of scientific studies through independent analysis of data and methods strengthens the conclusions. In this study, an issue has been identified and the results are being re-checked.

40

Re: Climate blog Final statement

Rebecca Scott

Sent: 08 June 2012 17:43
To: David John Karoly; John Dubois; Diane Squires; Joelle Gergis
Importance: High

Print publication of scientific study put on hold

An issue has been identified in the processing of the data used in the study, ŒEvidence of unusual late 20th century warming from an Australasian temperature reconstruction spanning the last millennium¹ by Joelle Gergis, Raphael Neukom, Stephen Phipps, Ailie Gallant and David Karoly, accepted for publication in the Journal of Climate.

We are currently reviewing the data.

On 8/06/12 4:40 PM, "David John Karoly" <dkaroly@unimelb.edu.au> wrote:

> Hi John and Rebecca,
>
> Below is our suggested statement in response to the climate change blog discussion.
>
> Your comments are welcome. We would like to send this to the blog site this evening, to be seen to be proactive in dealing with this. We do not want to do anything more until we meet on Tuesday morning. After that meeting, we will need to contact the federal Dept of Climate Change and Energy Efficiency, as they funded the study. We will also need to advise the Australian Science Media Centre, as they facilitated the media conference when this study was accepted for publication in mid-May.
>
> Best wishes, David
>
> ~~~~~~
> Prof David Karoly
> School of Earth Sciences
> University of Melbourne, VIC 3010, AUSTRALIA
> ph: +61 3 8344 4698
> fax: +61 3 8344 7761
> email: dkaroly@unimelb.edu.au
> http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
> ~~~~~~
>
> Publication of scientific study put on hold
>
> Publication of a recent scientific study on temperature variations in Australasia over the last thousand years has been delayed. The study, ŒEvidence of unusual late 20th century warming from an Australasian temperature reconstruction spanning the last millennium¹ by Joelle Gergis, Raphael Neukom, Stephen Phipps, Ailie Gallant and David Karoly, was recently accepted for publication in the Journal of Climate. An issue has been identified in the processing of the data used in the study, which may affect the results.
>
> While the paper states that ³both proxy climate and instrumental data were linearly detrended over the 19211990 period², it was discovered on Tuesday 5

> June that the records used in the final analysis were not detrended for proxy
> selection, making this statement incorrect. Although this is an unfortunate
> data processing issue, it is likely to have implications for the results
> reported in the study. The journal has been contacted and the publication of
> the study has been put on hold.
>
> This is a normal part of science. The testing of scientific studies through
> independent analysis of data and methods strengthens the conclusions. In this
> study, an issue has been identified and the results are being re-checked.
>
>
>

Rebecca Scott | Senior Media Officer | University Communications
Telephone +61 3 8344 0181 | Mobile +61 417 164 791 | Email
rebeccas@unimelb.edu.au
Web newsroom.melbourne.edu | Facebook facebook.com/melbuni |
Twitter twitter.com/uommedia

>>
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them. If this email is received in error please delete it and notify us by
return email.

41

FW: Statement in response

David John Karoly
Sent: 08 June 2012 17:56
To: Raphael Neukom[redacted]

Hi Raphi,

I hope you got some sleep. Joelle is away this weekend and not taking her computer.
As you will have seen from various emails, we have contacted J Climate and asked them to put the paper on hold, and contacted the PAGES 2K group as well.

We have had advice from the media team here at teh University, as well as an independent media advisor.
We have prepared a short statement to be used in response to any questions and to be sent to Stephen McIntyre to go on the ClimateAudit web site. The longer version of the statement is in the email message below.

The short version is

> **Print publication of scientific study put on hold**
>
> An issue has been identified in the processing of the data used in the study, "Evidence of unusual late 20th century warming from an Australasian temperature reconstruction spanning the last millennium" by Joelle Gergis, Raphael Neukom, Stephen Phipps, Ailie Gallant and David Karoly, accepted for publication in the *Journal of Climate*.
>
> We are currently reviewing the data and results.

Key points: We know there is an issue. The publication is on hold. We are reviewing the data and results. This is a normal part of science.

Hope you are happy with this, David

~~~~~~
Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
~~~~~~

From: Joelle Gergis
Sent: 08 June 2012 16:17
To: David John Karoly
Subject: Re: Statement in response

Print Publication of scientific study put on hold

Publication of a recent scientific study on temperature variations in Australasia over the last thousand years has been delayed. The study, 'Evidence of unusual late 20th century warming from an Australasian temperature reconstruction spanning the last millennium' by Joelle Gergis, Raphael Neukom, Stephen Phipps, Ailie Gallant and David Karoly, was recently accepted for publication in the *Journal of Climate*. An issue has been identified in the processing of the data used in the study, which may affect the results.

While the paper states that "both proxy climate and instrumental data were linearly detrended over the 1921–1990 period", it was discovered on Tuesday 5 June that the records used in the final analysis were not detrended for proxy selection, making this statement incorrect. Although this is an unfortunate data processing issue, it is likely to have implications for the results reported in the study. The journal has been contacted and the publication of the study has been put on hold.

This is a normal part of science. The testing of scientific studies through independent analysis of data and methods strengthens the conclusions. In this study, an issue has been identified and the results are being re-checked.

FW: Recent climate proxy study

Joelle Gergis

Sent: 08 June 2012 14:54
To: David John Karoly

42

------ Forwarded Message
From: [redacted]
Date: Fri, 8 Jun 2012 14:52:05 +1000
To: Joelle Gergis <jgergis@unimelb.edu.au>
Subject: Recent climate proxy study

Dear Dr Gergis

As a geoscientist following the debate regarding your recent climate paper with a southern hemisphere hockey stick, I can only conclude that what you have produced is a load of tendentious junk, full of statistical shortcomings and misstatements. The temperature records for the past century show no significant warming in Australia. Your geography is also very ordinary, since many of your sample sites are 1000s of km away from what normal people regard as Australasia.

Your refusal to provide data to others implies that it would not stand up to expert scrutiny.

Unless and until we hear from you in defence of what appears to be well based criticism, I can only say that this is a case of ". . . another zebra down – just another day on the Serengeti. . "

Yours faithfully

[redacted]

------ End of Forwarded Message

Publication of scientific study put on hold

43

David John Karoly
Sent: 08 June 2012 18:24
To: Swirepik, Anthony [Anthony.Swirepik@climatechange.gov.au]

Hi Anthony,

As I said on the phone, an issue has been identified in the study by Joelle Gergis, myself and others. This may affect the results. A longer explanation is at the bottom.
An short agreed statement is:

> **Print publication of scientific study put on hold**
>
> An issue has been identified in the processing of the data used in the study, "Evidence of unusual late 20th century warming from an Australasian temperature reconstruction spanning the last millennium" by Joelle Gergis, Raphael Neukom, Stephen Phipps, Ailie Gallant and David Karoly, accepted for publication in the *Journal of Climate*.
>
> We are currently reviewing the data and results.

Key points: We know there is an issue. The publication is on hold. We are reviewing the data and results. This is a normal part of science.

Hope you are happy with this. Please do not distribute this to the media without contacting me first. It is fine to use it in response to questions. I can be contacted over the weekend by mobile: [redacted]

Best wishes, David

~~~~~~
Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
~~~~~~

Print Publication of scientific study put on hold

Publication of a recent scientific study on temperature variations in Australasia over the last thousand years has been delayed. The study, 'Evidence of unusual late 20th century warming from an Australasian temperature reconstruction spanning the last millennium' by Joelle Gergis, Raphael Neukom, Stephen Phipps, Ailie Gallant and David Karoly, was recently accepted for publication in the *Journal of Climate*. An issue has been identified in the processing of the data used in the study, which may affect the results.

While the paper states that "both proxy climate and instrumental data were linearly detrended over the 1921–1990 period", it was discovered on Tuesday 5 June that the records used in the final analysis were not detrended for proxy selection, making this statement incorrect. Although this is an unfortunate data processing issue, it is likely to have implications for the results reported in the study. The journal has been contacted and the publication of the study has been put on hold.

This is a normal part of science. The testing of scientific studies through independent analysis of data and methods strengthens the conclusions. In this study, an issue has been identified and the results are being re-checked.

RE: FW: Statement in response

44

David John Karoly
Sent: 08 June 2012 18:36
To: Raphael Neukom [redacted]

Hi Raphi,

I am about to go home and have some dinner, then I'll send this to McIntyre, so that he gets it Friday morning. Melbourne Uni wanted as little detail in the short statement as possible. I'll put the date in my email to McIntyre, which he will likely post, as well as the short statement. I doubt that he will accept that we didn't find the issue without his help, but that doesn't matter.

Please keep good records of what happenned when, and what you did. Also, keep any records of emails you receive from McIntyre or other bloggers. Joelle is being sent hate emails.

I'll send you some more comments later about what I think you could do in terms of data processing and data selection, as well as checking, and the priorities. I agree that it might be good to run your code thru Ailie's processing software too, as a check.

I definitely don't want you to burn out. You need to do your best job for the fellowship interview in 2 weeks. I suggested that you both take a break, both Joelle and you, until you are together in Switzerland and can work on the analysis and processing together.

Best wishes, David

~~~~~~
Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
~~~~~~

From: Raphael Neukom [redacted]
Sent: 08 June 2012 18:18
To: David John Karoly
Subject: Re: FW: Statement in response

Hi David,

Thanks for this. I think this is a good strategy and the only way to move forward. I think the text is written well. Maybe we can include the date when we discovered the error also in the short statement so that it is clear that we did not just do it as a reaction to the McIntyre blog?

Maybe we can also make clear that it was my mistake, so that the Australian co-authors can be protected a bit from agressive mails they do not deserve. The public situation is more relaxed here in Switzerland.

I am just making the table with the decadal correlations. And I will try to write down everything that happened in the correct chronological order to be sure I can recall this all correctly. Because I think it may be interesting for some people to see how the error and its discovery developed and when/how we

(re-)acted.

Apart from that there are many things I could do in terms of analysis [redacted] So if you have some advice on what to do now first I would appreciate. I think all the analysis needs to be replicated by someone else (maybe Ailie or Steven) to make sure all other errors I made can be identified and eliminated. Also for the SH paper. I'll have to present my SNF proposal to the evaluation committee on June 19 and need to get prepared for this next week [redacted]

Thanks a lot for your support!

Raphi

Am 08.06.2012 09:56, schrieb David John Karoly:

> Hi Raphi,
>
> I hope you got some sleep. Joelle is away this weekend and not taking her computer.
> As you will have seen from various emails, we have contacted J Climate and asked them to put the paper on hold, and contacted the PAGES 2K group as well.
>
> We have had advice from the media team here at teh University, as well as an independent media advisor.
> We have prepared a short statement to be used in response to any questions and to be sent to Stephen McIntyre to go on the ClimateAudit web site. The longer version of the statement is in the email message below.
>
> The short version is
>
> **Print publication of scientific study put on hold**
>
> An issue has been identified in the processing of the data used in the study, "Evidence of unusual late 20th century warming from an Australasian temperature reconstruction spanning the last millennium" by Joelle Gergis, Raphael Neukom, Stephen Phipps, Ailie Gallant and David Karoly, accepted for publication in the *Journal of Climate*.
>
> We are currently reviewing the data and results.
>
> Key points: We know there is an issue. The publication is on hold. We are reviewing the data and results. This is a normal part of science.
>
> Hope you are happy with this, David

Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/

From: Joelle Gergis
Sent: 08 June 2012 16:17
To: David John Karoly
Subject: Re: Statement in response

Print Publication of scientific study put on hold

Publication of a recent scientific study on temperature variations in Australasia over the last thousand years has been delayed. The study, 'Evidence of unusual late 20th century warming from an Australasian temperature reconstruction spanning the last millennium' by Joelle Gergis, Raphael Neukom, Stephen Phipps, Ailie Gallant and David Karoly, was recently accepted for publication in the *Journal of Climate*. An issue has been identified in the processing of the data used in the study, which may affect the results.

While the paper states that "both proxy climate and instrumental data were linearly detrended over the 1921–1990 period", it was discovered on Tuesday 5 June that the records used in the final analysis were not detrended for proxy selection, making this statement incorrect. Although this is an unfortunate data processing issue, it is likely to have implications for the results reported in the study. The journal has been contacted and the publication of the study has been put on hold.

This is a normal part of science. The testing of scientific studies through independent analysis of data and methods strengthens the conclusions. In this study, an issue has been identified and the results are being re-checked.

--
Raphael Neukom
School of Earth Sciences
University of Melbourne
Victoria 3010, Australia

45

Re: Error in our JCLI-D-11-00649 submission

Whittaker, Gwendolyn [gwhittaker@ametsoc.org]
Sent: 08 June 2012 22:05
To: Joelle Gergis
Cc: John Chiang [chiang.jcli@ametsocmail.org]; JCLI Chief Editor [jcled@envsci.rutgers.edu]; Raphael Neukom [redacted] David John Karoly; s.phipps@unsw.edu.au; Ailie Jane Eyre Gallant

Dear Dr. Gergis and Dr. Chiang,

I have put a production HOLD on this paper - I will now await further word from Dr. Gergis and Dr. Chiang before any further production is done.

In cases where papers return to peer review (for another round of revision and new decision) after acceptance, we do remove the Early Online Release version from our site.

Gwendolyn

--
Gwendolyn Whittaker
Publications Coordinator &
Peer Review Support Manager
American Meteorological Society

gwhittaker@ametsoc.org

phone: 617.226.3929
fax: 617.531.2096

45 Beacon Street
Boston, MA 02108

On Thu, Jun 7, 2012 at 10:35 PM, Joelle Gergis <jgergis@unimelb.edu.au> wrote:

> Dear Dr Chiang
>
> I am the first author of the paper 'Evidence of unusual late 20th century warming from an Australasian temperature reconstruction spanning the last millennium' JCLI-D-11-00649 which was recently accepted for publication in the Journal of Climate.
>
> While attempting to release non-publicly available records used in our study with NOAA this week, our team discovered an error in our paper.
>
> In section 2.2 lines 220-224 of the paper we say:
>
> For predictor selection, both proxy climate and instrumental data were linearly detrended over the 1921–1990 period to avoid inflating the correlation coefficient due to the presence of the global warming signal present in the observed temperature record. Only records that were significantly ($p<0.05$) correlated with the detrended instrumental target over the 1921–1990 period were selected for analysis.
>
> When we went to recheck this on Tuesday, we discovered that the records used in the final analysis were not

detrended for proxy selection, making this statement incorrect.

The detrending of proxy records had been done in another paper on Southern Hemisphere temperature variations that we had been writing simultaneously, so we wrongly assumed the same thing had been done in the Australasian paper. [redacted] this was not picked up until now.

Although it was an unfortunate data processing error, it does have implications for the results of the paper. We wish to alert you to this issue before the paper goes into final production.

Meanwhile, independently of our team's detection of this error, prominent climate change blogger Stephen McIntyre has identified the issue overnight (I was alerted through an intimidating email this morning):

http://climateaudit.org/2012/06/06/gergis-significance

So instead of this being a unwanted but unfortunately normal part of science, we are likely to have an extremely negative online commentary about our work and possibly the journal. We apologise in advance for any problems caused.

As you know, the paper has already been accepted and is posted on the 'Early online release' section of the Journal of Climate website. Until we have a chance to revise the submission, we suggest that the paper is removed.

Please let us know how you'd like us to proceed, be it through a revised or new submission.

All the best

Joelle Gergis, on behalf of the co-authors

--
Dr Joelle Gergis
Climate Research Fellow
School of Earth Sciences
University of Melbourne,
VIC 3010, AUSTRALIA
Ph: +61 3 834 49868
Fax: +61 3 834 47761
http://climatehistory.com.au

On 1/05/12 1:57 PM, "John Chiang" <chiang.jcli@ametsocmail.org> wrote:

> CC: chiang.jcli@ametsocmail.org
>

> Re: JCLI-D-11-00649
> Journal of Climate
>
>
> Dear Dr. Gergis,
>
> We are pleased to inform you that your manuscript, "Evidence of unusual late
> 20th century warming from an Australasian temperature reconstruction spanning
> the last millennium," has been accepted for publication in Journal of Climate.
>
> Congratulations!
>
> Your paper will begin production after AMS has received the appropriate Page
> and Color Charge Form from you or your funding administration. Links to the
> forms are below.
>
> Now that your manuscript has been accepted for publication, the peer-review
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> information, please contact AMS Publications Coordinator Gwendolyn Whittaker
> (gwhittaker@ametsoc.org).
>
> Thank you for publishing in Journal of Climate
>
> Sincerely,
>
> Dr. John Chiang, editor
> Journal of Climate
>
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> Gwendolyn Whittaker, Publications Coordinator, gwhittaker@ametsoc.org
>
>

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Gwendolyn Whittaker
Publications Coordinator &
Peer Review Support Manager
American Meteorological Society

gwhittaker@ametsoc.org

phone: 617.226.3929
fax: 617.531.2096

45 Beacon Street
Boston, MA 02108

FREEDOM OF INFORMATION REQUEST

Part 2(b)

Emails between paper authors 30th May to 12th June 2012

Karoly emails 46 - 90

FW: Print production of scientific study put on hold

46

David John Karoly
Sent: 09 June 2012 06:08
To: Joelle Gergis; Raphael Neukom [redacted] Ailie Jane Eyre Gallant; s.phipps@unsw.edu.au

Hi,

I have just sent the email below to Stephen McIntyre. If you are asked about the study, please refer to the statement and stick to the following key messages.

Key points: We know there is an issue. The publication is on hold. We are reviewing the data and results. This is a normal part of science.

Best wishes, David

~~~~~~
Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
~~~~~~

From: David John Karoly
Sent: 09 June 2012 06:02
To: smcintyre25@yahoo.com
Subject: Print production of scientific study put on hold

Dear Stephen,

I am contacting you on behalf of all the authors of the Gergis et al (2012) study 'Evidence of unusual late 20th century warming from an Australasian temperature reconstruction spanning the last millennium'

An issue has been identified in the processing of the data used in the study, which may affect the results. While the paper states that "both proxy climate and instrumental data were linearly detrended over the 1921–1990 period", we discovered on Tuesday 5 June that the records used in the final analysis were not detrended for proxy selection, making this statement incorrect. Although this is an unfortunate data processing issue, it is likely to have implications for the results reported in the study. The journal has been contacted and the publication of the study has been put on hold.

This is a normal part of science. The testing of scientific studies through independent analysis of data and methods strengthens the conclusions. In this study, an issue has been identified and the results are being re-checked.

We would be grateful if you would post the notice below on your ClimateAudit web site.
We would like to thank you and the participants at the ClimateAudit blog for your scrutiny of our study, which also identified this data processing issue.

Thanks, David Karoly

Print publication of scientific study put on hold

An issue has been identified in the processing of the data used in the study, "Evidence of unusual late 20th century warming from an Australasian temperature reconstruction spanning the last millennium" by Joelle Gergis, Raphael Neukom, Stephen Phipps, Ailie Gallant and David Karoly, accepted for publication in the *Journal of Climate*.

We are currently reviewing the data and results.

~~~~~~
Prof David Karoly
School of Earth Sciences
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ph: +61 3 8344 4698
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email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
~~~~~~

47

Print production of scientific study put on hold

David John Karoly
Sent: 09 June 2012 06:10
To: smcintyre25@yahoo.ca

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email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
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FW: Print production of scientific study put on hold

48

David John Karoly
Sent: 09 June 2012 06:21
To: Michael Mann [mann@meteo.psu.edu]

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Subject: Print production of scientific study put on hold

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Re: Print production of scientific study put on hold

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Michael Mann [mann@meteo.psu.edu]
Sent: 09 June 2012 06:39
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Attachments: WahletalScience06.pdf (107 KB) ; MRWA-JGR07.pdf (1 MB)

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RE: Print production of scientific study put on hold

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Re: Print production of scientific study put on hold

51

Michael Mann [mann@meteo.psu.edu]
Sent: 09 June 2012 07:41
To: David John Karoly

thanks very much David,
that all sounds very reasonable, and re-assuring too.
I'll be anxious to see the updated results. I'll be surprised if it fundamentally changes the conclusion, but I guess I'll have to stay tuned like the others.
please keep me updated on this.
ok if I share this w/ Gavin and Eric Steig?
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The sooner you guys can comment, the better.
otherwise the worst will be assumed, sadly :(
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Re: Error in our JCLI-D-11-00649 submission

Whittaker, Gwendolyn [gwhittaker@ametsoc.org]
Sent: 09 June 2012 08:59
To: David John Karoly
Cc: Joelle Gergis; John Chiang [chiang.jcli@ametsocmail.org]; JCLI Chief Editor [jcled@envsci.rutgers.edu]; Raphael Neukom [redacted] s.phipps@unsw.edu.au; Ailie Jane Eyre Gallant

Dear Dr. Gergis and all,

I can confirm that press removed the EOR version of this paper from our site earlier this afternoon.

Gwendolyn

On Fri, Jun 8, 2012 at 3:44 PM, David John Karoly <dkaroly@unimelb.edu.au> wrote:

> Thanks for advising us of this action. It is what we wanted.
>
> Thanks, David
>
> ~~~~~~
> **Prof David Karoly**
> School of Earth Sciences
> University of Melbourne, VIC 3010, AUSTRALIA
> ph: +61 3 8344 4698
> fax: +61 3 8344 7761
> email: dkaroly@unimelb.edu.au
> http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
> ~~~~~~
>
> ---
>
> **From:** Whittaker, Gwendolyn [gwhittaker@ametsoc.org]
> **Sent:** 08 June 2012 22:05
> **To:** Joelle Gergis
> **Cc:** John Chiang; JCLI Chief Editor; Raphael Neukom; David John Karoly; s.phipps@unsw.edu.au; Ailie Jane Eyre Gallant
> **Subject:** Re: Error in our JCLI-D-11-00649 submission
>
> Dear Dr. Gergis and Dr. Chiang,
>
> I have put a production HOLD on this paper - I will now await further word from Dr. Gergis and Dr. Chiang before any further production is done.
>
> In cases where papers return to peer review (for another round of revision and new decision) after acceptance, we do remove the Early Online Release version from our site.
>
> Gwendolyn
>
> --
> Gwendolyn Whittaker
> Publications Coordinator &
> Peer Review Support Manager
> American Meteorological Society

gwhittaker@ametsoc.org

phone: 617.226.3929
fax: 617.531.2096

45 Beacon Street
Boston, MA 02108

On Thu, Jun 7, 2012 at 10:35 PM, Joelle Gergis <jgergis@unimelb.edu.au> wrote:

Dear Dr Chiang

I am the first author of the paper 'Evidence of unusual late 20th century warming from an Australasian temperature reconstruction spanning the last millennium' JCLI-D-11-00649 which was recently accepted for publication in the Journal of Climate.

While attempting to release non-publicly available records used in our study with NOAA this week, our team discovered an error in our paper.

In section 2.2 lines 220-224 of the paper we say:

For predictor selection, both proxy climate and instrumental data were linearly detrended over the 1921–1990 period to avoid inflating the correlation coefficient due to the presence of the global warming signal present in the observed temperature record. Only records that were significantly ($p<0.05$) correlated with the detrended instrumental target over the 1921–1990 period were selected for analysis.

When we went to recheck this on Tuesday, we discovered that the records used in the final analysis were not detrended for proxy selection, making this statement incorrect.

The detrending of proxy records had been done in another paper on Southern Hemisphere temperature variations that we had been writing simultaneously, so we wrongly assumed the same thing had been done in the Australasian paper [redacted] this was not picked up until now.

Although it was an unfortunate data processing error, it does have implications for the results of the paper. We wish to alert you to this issue before the paper goes into final production.

Meanwhile, independently of our team's detection of this error, prominent climate change blogger Stephen McIntyre has identified the issue overnight (I was alerted through an intimidating email this morning):

http://climateaudit.org/2012/06/06/gergis-significance

So instead of this being a unwanted but unfortunately normal part of science, we are likely to have an extremely negative online commentary about our work and possibly the journal. We apologise in advance for any problems caused.

As you know, the paper has already been accepted and is posted on the 'Early online release' section of

the Journal of Climate website. Until we have a chance to revise the submission, we suggest that the paper is removed.

Please let us know how you'd like us to proceed, be it through a revised or new submission.

All the best

Joelle Gergis, on behalf of the co-authors

--
Dr Joelle Gergis
Climate Research Fellow
School of Earth Sciences
University of Melbourne,
VIC 3010, AUSTRALIA
Ph: +61 3 834 49868
Fax: +61 3 834 47761
http://climatehistory.com.au

On 1/05/12 1:57 PM, "John Chiang" <chiang.jcli@ametsocmail.org> wrote:

> CC: chiang.jcli@ametsocmail.org
>
> Re: JCLI-D-11-00649
> Journal of Climate
>
>
> Dear Dr. Gergis,
>
> We are pleased to inform you that your manuscript, "Evidence of unusual late
> 20th century warming from an Australasian temperature reconstruction spanning
> the last millennium," has been accepted for publication in Journal of Climate.
>
> Congratulations!
>
> Your paper will begin production after AMS has received the appropriate Page
> and Color Charge Form from you or your funding administration. Links to the
> forms are below.
>
> Now that your manuscript has been accepted for publication, the peer-review
> editorial office no longer has control of it. If you need further
> information, please contact AMS Publications Coordinator Gwendolyn Whittaker
> (gwhittaker@ametsoc.org).

> Thank you for publishing in Journal of Climate
>
> Sincerely,
>
> Dr. John Chiang, editor
> Journal of Climate
>
>
> **********
> PRODUCTION INFORMATION
> **********
> Questions about charges should be sent to Christine Keane
> (ckeane@ametsoc.org).
>
> ----If you are paying your charges in full and submitted your paper before 1
> May 2011, use:
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> after 1 May 2011, use:
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>
> Reprints can be ordered from Sheridan Press using the following link:
> http://eoc.sheridan.com/ametsoc/eoc
>
> If you need further information, please contact:
> Gwendolyn Whittaker, Publications Coordinator, gwhittaker@ametsoc.org
>
>

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Gwendolyn Whittaker

Publications Coordinator &
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54

RE: Print production of scientific study put on hold

David John Karoly
Sent: 09 June 2012 10:19
To: Michael Mann [mann@meteo.psu.edu]

Hi Mike,

I am happy for you to share my emails with Gavin and Eric. I am not surprised that WUWT has posted. I expect that CA will post something soon, but I haven't received a response from McIntyre yet.

As I said earlier, I would prefer that RC did not post prior to CA.

We do not plan to make any more detailed response on the paper and the reasons for the withdrawal than what I have sent to CA and to you. We need to redo the analysis to assess how much the detrending of the data over the calibration period affects the proxy selection, and then the results. We need then to consider whether the detrending should be included or not. As you said earlier, there may be good reasons for not using detrended data for the proxy selection. It is much better that we have answers to these questions than prepare a hasty response. The manuscript will likely go back to the reviewers for another review of the revised manuscript.
I do not want the timing of our responses to be reactive or to be determined by what WUWT or CA post.
The question of how much the issue with the data processing affects the results will be determined by further analysis. It is not a fatal flaw.

Thanks for your comments and support, David

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Prof David Karoly
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From: Michael Mann [mann@meteo.psu.edu]
Sent: 09 June 2012 07:41
To: David John Karoly
Subject: Re: Print production of scientific study put on hold

thanks very much David,
that all sounds very reasonable, and re-assuring too.
I'll be anxious to see the updated results. I'll be surprised if it fundamentally changes the conclusion, but I guess I'll have to stay tuned like the others.
please keep me updated on this.
ok if I share this w/ Gavin and Eric Steig?
thanks,
mike

On Jun 8, 2012, at 4:57 PM, David John Karoly wrote:

> Hi Mike,
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> Thanks for your email. I agree with all your comments about McIntyre, except that you shouldn't say that McIntyre has leaked this. He or someone on his blog noticed that the paper was no longer available in the EOR site for JClimate (correct). We sent him information about the status of the paper and asked him to make a post.
> We'll see what happens. We can only hope.

Thanks also for your comments about detrending prior to calibration or not. That is why we say there is an issue with the study, rather than an error. The manuscript says the data were detrended, but in fact they were not. Given the small number of proxies in the Australasian region, we have used proxies from a wider region. Some show negative correlations with Australasian temps on interannual time scales, due to the spatial structure of the teleconnection pattern, but positive correlations for the recent trend.

We do have to correct the statement in the paper. We have not yet decided whether we will stick with the full calibration ie current results or a detrended calibration.

I'll look at your papers and discuss with Raphi and Joelle. I am definitely not an expert in palaeoclimate, which is why I am n-th author on the paper, there to provide advice and protection.

Best wishes, David

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Prof David Karoly
School of Earth Sciences
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From: Michael Mann [mann@meteo.psu.edu]
Sent: 09 June 2012 06:39
To: David John Karoly
Subject: Re: Print production of scientific study put on hold

Hi David,
Well I'm afraid McIntyre has probably already leaked this anyway. I probably don't have to tell you this, but don't trust him to behave ethically or honestly here, and assume that anything you tell him will be cherry-picked in a way that maximally discredits the study and will be leaked as suits his purposes.

We have simply noted at RC in the comments that the paper does appear to have been retracted from the AMS website, and we have no further information as to why.
I will share this w/ Eric and Gavin so they know the status,
mike

p.s. just a side note. we have found in our own extensive pseudoproxy tests that detrending the data prior to calibration is *not* actually a good idea. See abstract of the '07 JGR article also the attached *Science* comment by Wahl et al. So even if that does change the results, its not obvious that it would be for the better. Just my two cents.

[see attached file: WahletalScience06.pdf] [see attached file: MRWA-JGR07.pdf]

On Jun 8, 2012, at 4:21 PM, David John Karoly wrote:

> Hi Mike,
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> The comment on RealClimate is correct. We have identified a data processing issue with the Gergis et al (2012) study. I have just sent the following email to Stephen McIntyre.
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> I would be grateful if you would hold off posting anything about this on the RealClimate site until Monday. Some people might reach the wrong conclusions if RealClimate was to

have a post on this before ClimateAudit.

This is a normal part of science, and demonstrates that science works.

Best wishes, David

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~~~~~~

From: David John Karoly
Sent: 09 June 2012 06:10
To: smcintyre25@yahoo.ca
Subject: Print production of scientific study put on hold

Dear Stephen,

I am contacting you on behalf of all the authors of the Gergis et al (2012) study 'Evidence of unusual late 20th century warming from an Australasian temperature reconstruction spanning the last millennium'

An issue has been identified in the processing of the data used in the study, which may affect the results. While the paper states that "both proxy climate and instrumental data were linearly detrended over the 1921–1990 period", we discovered on Tuesday 5 June that the records used in the final analysis were not detrended for proxy selection, making this statement incorrect. Although this is an unfortunate data processing issue, it is likely to have implications for the results reported in the study. The journal has been contacted and the publication of the study has been put on hold.

This is a normal part of science. The testing of scientific studies through independent analysis of data and methods strengthens the conclusions. In this study, an issue has been identified and the results are being re-checked.

We would be grateful if you would post the notice below on your ClimateAudit web site.
We would like to thank you and the participants at the ClimateAudit blog for your scrutiny of our study, which also identified this data processing issue.

Thanks, David Karoly

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> study, "Evidence of unusual late 20th century warming from an

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We are currently reviewing the data and results.

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Re: Print production of scientific study put on hold

55

Michael Mann [mann@meteo.psu.edu]
Sent: 09 June 2012 11:35
To: David John Karoly

thanks David,
that's good to know, it might prove very helpful.

by the way, what I meant was that we will post an update/correction to our RC article only *after* you, Joelle et al have an *official* update that you're ready to go public with. So we'll just sit tight in the meantime, and await word from you guys.

this will all blow over and hopefully, in the end, amount to less than a mole hill...

talk to you later,
mike

On Jun 8, 2012, at 9:19 PM, David John Karoly wrote:

> Go for it. There is a robust discussion on CA at
> http://climateaudit.org/2012/06/08/gergis-et-al-put-on-hold/
>
> Not all of it as bad as many CA discussions, but I do have rose-colored glasses on.
>
> Best wishes, David
>
> PS We do have a fully-documented record or who, when and how the data processing issue was identified by a member of the author team independent of, and before, any posts on this issue at CA or other web sites. Please don't post the last comment.
>
> ~~~~~~
> **Prof David Karoly**
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> **From:** Michael Mann [mann@meteo.psu.edu]
> **Sent:** 09 June 2012 10:43
> **To:** David John Karoly
> **Subject:** Re: Print production of scientific study put on hold
>
> ok David,
> will inform them. please do keep us updated/posted. we'll post some sort of update to the piece in due course.
> I'm sure this isn't a fatal flaw. But a good idea to double-check everything and make sure its air tight when you go public w/ any correction.
> thanks for the update. looking forward to further word,

mike

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$300,000 for a three-week...

56

[redacted]
Sent: 10 June 2012 06:25
To: [redacted]

From: ***The Courier Mail / Herald Sun***

$300,000 for a three-week scare

Andrew Bolt –, Sunday, June, 10, 2012, (5:12am)

As Jo Nova puts it:
300,000 dollars and three years to produce a paper that lasted three weeks
She's talking about the paper by Joelie Gergis, researcher and warmist activist, purporting to show unprecedented warming of all of (whisper this next bit) 0.09 degrees in Australasia:
The paper might have been scientifically invalid, but it was a box-office success.
The headlines were everywhere
"1000 years of climate data confirms Australia's warming" said the press release from University of Melbourne. It was picked up by The Guardian: "Australasia has hottest 60 years in a millennium, scientists find"; The Age and The Australian led with "Warming since 1950 'unprecedented'. The story was on ABC 24 and ABC news where Gergis proclaimed:" there are no other warm periods in the last 1000 years that match the warming experienced in Australasia since 1950." It was all over the ABC including ABC Radio National, and they were "95% certain"! On ABC AM, "the last five decades years in Australia have been the warmest. " Plus there were pages in Science Alert, Campus Daily Eco news, The Conversation, Real Climate and Think Progress....
Skeptics have been looking through the paper, and three weeks after it was published a team at Climate Audit uncovered a problem so significant that the authors announced that this paper is "on hold". It has been withdrawn from the American Meteorological Society website. Bishop Hill has probably the best summary of what this means, and how it unfolded.
The question:
Will any of these media outlets update their news?...
On AM, David Karoly raved about how the study was strong because it relied more on observations not modeling (it is getting to them that skeptics keep pointing out they have no empirical evidence), and claimed he had "high confidence" in the results. (Is that the same kind of high confidence he has in future predictions of warming?)
MATTHEW CARNEY: Professor Karoly says the strength of the study is that it's relied more on direct observations and measurements than climate modelling.
DAVID KAROLY: Nothing is absolutely certain in science but we say with very high confidence because we have repeated the analysis alone for the uncertainties that the warming in the last 50 years is very unusual and cannot, very likely cannot be explained by natural climate variability alone.
How concerned are they with accuracy? Are all these media outlets happy to leave their readers or viewers with the impression that these results are robust, reliable, and strong?

Question

57

[redacted]

Sent: 10 June 2012 13:00
To: David John Karoly

Dear Professor Karoly:

In light of recent comments about the recently published Gergis paper, will you be issuing any revised opinions regarding this paper and its conclusions?

Sincerely,

[redacted]
Albany, WA

FREE Animations for your email - by IncrediMail! Click Here!

just wanted to be sure

Andrew Revkin [redacted]
Sent: 10 June 2012 14:41
To: David John Karoly

58

Dear David,

Been on the road and immersed on other subjects but caught up with the mcintyre post tonight. Is your note to him cited correctly?
Is there a gameplan/timetable for reviewing the issue?
(and do you know if the U of Melbourne press office is going to issue an update on the news release it sent out when the paper came out?)

Gergis et al "Put on Hold"

Jun 8, 2012 – 3:56 PM

A few days ago, Joelle Gergis closed her letter refusing data stating:

> *We will not be entertaining any further correspondence on the matter.*

Gergis' statement seems to have been premature. David Karoly, the senior author, who had been copied on Gergis' surly email and who is also known as one of the originators of the "death threat" story, wrote today:

> *Dear Stephen,*
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> *This is a normal part of science. The testing of scientific studies through independent analysis of data and methods strengthens the conclusions. In this study, an issue has been identified and the results are being re-checked.*
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I urge readers not to get too wound up about this, as there are a couple of potential fallback positions. They might still claim to "get" a Stick using the reduced population of proxies that pass their professed test. Alternatively, they might now say that the "right" way of screening is to do so without detrending and "get" a Stick that way. However, they then have to face up to the "Screening Fallacy". As noted in my earlier post, while this fallacy is understood on critical blogs, it is not understood by real_climate_scientists and I would not be surprised it Gergis et al attempt to revive their article on that basis.

One thing we do know. In my **first post** on Gergis et al on May 31, I had referred to the Screening Fallacy. The following day (June 1), the issue of screening on de-trended series was discussed in comment. I added the following comment in the main post (responding to comment by Jim Bouldin and others):

> *Gergis et al 2012 say that their screening is done on de-trended series. This measure might mitigate the screening fallacy – but this is something that would need to be checked carefully. I haven't yet checked on the other papers in this series.*

There was a similar discussion at Bishop Hill. What the present concession means – is that my concession was premature and that the screening actually done by Gergis et al was within the four corners of the Screening Fallacy. However, no concessions have been made on this point.

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http://www.nytimes.com/dotearth
Senior Fellow, Pace Acad. for Applied Env. Studies
Cell: 914-441-5556 Fax: 914-989-8009
Twitter: @revkin Skype: Andrew.Revkin

RE: just wanted to be sure

59

David John Karoly
Sent: 10 June 2012 16:19
To: Andrew Revkin [redacted]

Hi Andrew,

Thanks for your interest in this study. As far as I can tell, Stephen has cited my email to him correctly. His comments are of course his own.

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Cell: 914-441-5556 Fax: 914-989-8009
Twitter: @revkin Skype: Andrew.Revkin

60

RE: Question

David John Karoly
Sent: 10 June 2012 16:23
To: [redacted]

Dear [redacted]

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Best wishes, David

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Sincerely,

[redacted]
Albany, WA

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Re: just wanted to be sure

61

Andrew Revkin [redacted]
Sent: 10 June 2012 22:55
To: David John Karoly

Thanks!

p.s., i know there's lots of acrimony and assertion online, but also an awful lot of minds testing the quality of information. Would you say this secondary peer review in the blogosphere is, on balance, good or bad for the scientific process?

On Sun, Jun 10, 2012 at 2:19 AM, David John Karoly <dkaroly@unimelb.edu.au> wrote:

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62

FW: Print production of scientific study put on hold

David John Karoly
Sent: 11 June 2012 11:52
To: [redacted]@theage.com.au]

Hi [redacted]

This is what I sent to Stephen McIntyre.

Best wishes, David

Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/

From: David John Karoly
Sent: 09 June 2012 06:10
To: smcintyre25@yahoo.ca
Subject: Print production of scientific study put on hold

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email: dkaroly@unimelb.edu.au
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Print publication put on hold

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64

Fwd: Please set the record straight

Rebecca Scott
Sent: 11 June 2012 12:03
To: Diane Squires; John Dubois; David John Karoly

Hi all, I've received several emails like this one - but this has been sent to Media aswell

I have received several others calling for release to be taken down

See below

Rebecca

Sent from my iPhone

Begin forwarded message:

From: [redacted]
Date: 10 June 2012 8:59:01 AM AEST
To: <rebeccas@unimelb.edu.au>
Cc: [redacted]
Subject: Please set the record straight

Rebecca

I've read your press release 1000 years of climate data confirms Australia's warming, note that it has been widely circulated, have Cc'd as many publishers as possible directly and am in process of contacting the others through their websites.

The paper you lauded as "form(ing) the Australasian region's contribution to the 5th IPCC climate change assessment report chapter on past climate" has survived for just three weeks.

It has been taken down from the American Meteorological Society and Real Climate websites.

The Paper has been put on hold.

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study has been put on hold.

Alarmist predictions are being debunked on a daily basis and there is no better local example than Tim Flannery and his rainfall predictions. Every one of them has turned out to be utterly wrong.

Please set the Australian public record straight about the Gergis et al Paper.

Best regards

[redacted]

[redacted]

[redacted]

****** Confidentiality and Privilege Notice *******

This e-mail is intended only to be read or used by the addressee. It is confidential and may contain legally pri vileged information. You may not disclose, copy, distribute, rely on, modify or use this email except as authorised by the sender. If you have received this message in error, please notify me immediately by return email and delete this email. The sender does not accept any liability for any loss or damage arising from the use of any information or data contained in this email or attachment. Confidentiality and legal priv ilege are not waived or lost by reason of mistaken delivery to you.

65

Journal of Climate paper

[redacted] on behalf of Ivan Oransky [ivan-oransky@erols.com]
Sent: 11 June 2012 04:16
To: David John Karoly

Professor Karoly:

I blog at Retraction Watch: http://retractionwatch.com. I'm writing a post about your Journal of Climate paper that is now on hold and had a few questions:

-- I take it from your comments elsewhere that you expect to do another analysis and correct the paper. Is that accurate? Do you have a time-frame for that?
-- Has the analysis in this paper been used by other work, and if so, will other studies require correction?

Thanks in advance.

Regards,
Ivan Oransky

--
Ivan Oransky, MD
Executive Editor, Reuters Health
Adjunct Assistant Professor, New York University's Science, Health, and Environmental Reporting Program
Treasurer, Association of Health Care Journalists
Clinical Assistant Professor of Medicine, New York University School of Medicine
Blogger, Embargo Watch http://embargowatch.wordpress.com (a blog independent of Reuters that does not necessarily reflect its views)
Blogger, Retraction Watch http://retractionwatch.wordpress.com (ditto)
http://twitter.com/ivanoransky
[redacted]

Re: Please set the record straight

66

Diane Squires
Sent: 11 June 2012 13:04
To: Rebecca Scott
Cc: John Dubois; David John Karoly

Thanks Bec
As discussed we will add the paragraph agreed to on Friday to the media release.

David, have you sent this paragraph on to the other authors as well?
Also, am I correct in thinking the other authors will send any media queries on to you?

Thanks
Diane

--
Diane Squires
Media and PR Director
Marketing and Communications
University of Melbourne

P: +61 3 8344 6937
M: 0432 754 232
E: dsquires@unimelb.edu.au

www.newsroom.melbourne.edu

On 11/06/2012, at 12:03 PM, "Rebecca Scott" <rebeccas@unimelb.edu.au> wrote:

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> I have received several others calling for release to be taken down
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> See below
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>
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>
> Begin forwarded message:
>
> **From:** [redacted]
> **Date:** 10 June 2012 8:59:01 AM AEST
> **To:** <rebeccas@unimelb.edu.au>
> **Cc:** <newsdesk@theage.com.au>, <letters@theaustralian.com.au>, <justin.norrie@theconversation.edu.au>, <contrib@realclimate.org>, <editor@sciencealert.com.au>, <userhelp@guardian.co.uk>,

<online@theaustralian.com.au>
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[redacted]

[redacted]

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please notify me immediately by return email and delete this email. The sender does not accept any liability for any loss or damage arising from the use of any information or data contained in this email or attachment. Confidentiality and legal privilege are not waived or lo st by reason of mistaken delivery to you.

RE: Please set the record straight

67

David John Karoly
Sent: 11 June 2012 14:00
To: Diane Squires; Rebecca Scott
Cc: John Dubois

Hi Dianne,

I did not send the paragraph to all teh co-authors on Friday evening, only to the one in Europe who was available over the weekend. The others are out of contact. I will send it to all the co-authors later today.

I did send the paragraph to the Climate blog site on Friday night/Sat morning, which has led to those email queries. I have also sent it to Adam Morton from the Age, as he called me today and will likely write a short peice for tomorrow's paper, and to Andy Revkin from the New York Times, who sent me an email question.

Yes, all media queries are being sent to me.

Best wishes, David

~~~~~~
Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
~~~~~~

From: Diane Squires
Sent: 11 June 2012 13:04
To: Rebecca Scott
Cc: John Dubois; David John Karoly
Subject: Re: Please set the record straight

Thanks Bec
As discussed we will add the paragraph agreed to on Friday to the media release.

David, have you sent this paragraph on to the other authors as well?
Also, am I correct in thinking the other authors will send any media queries on to you?

Thanks
Diane

--
Diane Squires
Media and PR Director
Marketing and Communications
University of Melbourne

P: +61 3 8344 6937
M: 0432 754 232
E: dsquires@unimelb.edu.au

www.newsroom.melbourne.edu

On 11/06/2012, at 12:03 PM, "Rebecca Scott" <rebeccas@unimelb.edu.au> wrote:

Hi all, I've received several emails like this one - but this has been sent to Media aswell

I have received several others calling for release to be taken down

See below

Rebecca

Sent from my iPhone

Begin forwarded message:

From: [redacted]
Date: 10 June 2012 8:59:01 AM AEST
To: <rebeccas@unimelb.edu.au>
Cc: [redacted]
Subject: Please set the record straight

Rebecca

I've read your press release 1000 years of climate data confirms Australia's warming, note that it has been widely circulated, have Cc'd as many publishers as possible directly and am in process of contacting the others through their websites.

The paper you lauded as "form(ing) the Australasian region's contribution to the 5th IPCC climate change assessment report chapter on past climate" has survived for just three weeks.

It has been taken down from the American Meteorological Society and Real Climate websites.

The Paper has been put on hold.

An issue has been identified in the processing of the data used in the study, which may affect the results. While the paper states that "both proxy climate and instrumental data were linearly detrended over the 1921–1990 period", we discovered on Tuesday 5 June that the records

used in the final analysis were not detrended for proxy selection, making this statement incorrect. Although this is an unfortunate data processing issue, it is likely to have implications for the results reported in the study. The journal has been contacted and the publication of the study has been put on hold.

Alarmist predictions are being debunked on a daily basis and there is no better local example than Tim Flannery and his rainfall predictions. Every one of them has turned out to be utterly wrong.

Please set the Australian public record straight about the Gergis et al Paper.

Best regards

[redacted]

[redacted]

[redacted]

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FW: Gergis et al put on hold

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Joelle Gergis
Sent: 11 June 2012 16:01
To: David John Karoly

From: [redacted]
Sent: Saturday, 9 June 2012 9:33 AM
To: Joelle Gergis
Cc: Robyn Williams; Andrew Jaspan
Subject: Gergis et al put on hold

Dear Joelle,
Do hope you let ABC and The Conversation they need to update their stories.

Gergis et al put on hold
http://climateaudit.org/2012/06/08/gergis-et-al-put-on-hold/

cheers
[redacted]

FW: Error in our JCLI-D-11-00649 submission

69

Joelle Gergis
Sent: 11 June 2012 16:01
To: David John Karoly; Raphael Neukom [redacted] Ailie Jane Eyre Gallant; Steven J Phipps [s.phipps@unsw.edu.au]

From: John Chiang [jch_chiang@berkeley.edu]
Sent: Saturday, 9 June 2012 9:04 AM
To: Joelle Gergis
Cc: John Chiang
Subject: Fwd: Error in our JCLI-D-11-00649 submission

Dear Joelle:

After consulting with the Chief Editor, I have decided to rescind acceptance of the paper - you'll receive an official email from J Climate to this effect as soon as we figure out how it should be properly done. I believe the EOR has already been taken down.

Also, since it appears that you will have to redo the entire analysis (and which may result in different conclusions), I will also be requesting that you withdraw the paper from consideration. Again, you'll hear officially from J Climate in due course. I invite you to resubmit once the necessary analyses and changes to the manuscript have been made.

I hope this will be acceptable to you. I regret the situation, but thank you for bringing it to my prompt attention.

Best regards,
John

From: Joelle Gergis <jgergis@unimelb.edu.au>
Subject: Error in our JCLI-D-11-00649 submission
Date: June 8, 2012 4:35:28 AM GMT+02:00
To: John Chiang <chiang.jcli@ametsocmail.org>, "Whittaker, Gwendolyn" <gwhittaker@ametsoc.org>, JCLI Chief Editor <jcled@envsci.rutgers.edu>
Cc: Raphael Neukom [redacted], David John Karoly <dkaroly@unimelb.edu.au>, "s.phipps@unsw.edu.au" <s.phipps@unsw.edu.au>, Ailie Jane Eyre Gallant <agallant@unimelb.edu.au>

Dear Dr Chiang

I am the first author of the paper 'Evidence of unusual late 20th century warming from an Australasian temperature reconstruction spanning

the last millennium' JCLI-D-11-00649 which was recently accepted for publication in the Journal of Climate.

While attempting to release non-publicly available records used in our study with NOAA this week, our team discovered an error in our paper.

In section 2.2 lines 220-224 of the paper we say:

For predictor selection, both proxy climate and instrumental data were linearly detrended over the 1921–1990 period to avoid inflating the correlation coefficient due to the presence of the global warming signal present in the observed temperature record. Only records that were significantly ($p<0.05$) correlated with the detrended instrumental target over the 1921–1990 period were selected for analysis.

When we went to recheck this on Tuesday, we discovered that the records used in the final analysis were not detrended for proxy selection, making this statement incorrect.

The detrending of proxy records had been done in another paper on Southern Hemisphere temperature variations that we had been writing simultaneously, so we wrongly assumed the same thing had been done in the Australasian paper. [redacted] this was not picked up until now.

Although it was an unfortunate data processing error, it does have implications for the results of the paper. We wish to alert you to this issue before the paper goes into final production.

Meanwhile, independently of our team's detection of this error, prominent climate change blogger Stephen McIntyre has identified the issue overnight (I was alerted through an intimidating email this morning):

http://climateaudit.org/2012/06/06/gergis-significance

So instead of this being a unwanted but unfortunately normal part of science, we are likely to have an extremely negative online commentary about our work and possibly the journal. We apologise in advance for any problems caused.

As you know, the paper has already been accepted and is posted on the 'Early online release' section of the Journal of Climate website. Until we have a chance to revise the submission, we suggest that the paper is removed.

Please let us know how you'd like us to proceed, be it through a revised

or new submission.

All the best

Joelle Gergis, on behalf of the co-authors

--
Dr Joelle Gergis
Climate Research Fellow
School of Earth Sciences
University of Melbourne,
VIC 3010, AUSTRALIA
Ph: +61 3 834 49868
Fax: +61 3 834 47761
http://climatehistory.com.au

On 1/05/12 1:57 PM, "John Chiang" <chiang.jcli@ametsocmail.org> wrote:

> CC: chiang.jcli@ametsocmail.org
>
> Re: JCLI-D-11-00649
> Journal of Climate
>
>
> Dear Dr. Gergis,
>
> We are pleased to inform you that your manuscript, "Evidence of unusual late
> 20th century warming from an Australasian temperature reconstruction spanning
> the last millennium," has been accepted for publication in Journal of Climate.
>
> Congratulations!
>
> Your paper will begin production after AMS has received the appropriate Page
> and Color Charge Form from you or your funding administration. Links to the
> forms are below.
>
> Now that your manuscript has been accepted for publication, the

peer-review
> editorial office no longer has control of it. If you need further
> information, please contact AMS Publications Coordinator Gwendolyn Whittaker
> (gwhittaker@ametsoc.org).
>
> Thank you for publishing in Journal of Climate
>
> Sincerely,
>
> Dr. John Chiang, editor
> Journal of Climate
>
>
> **********
> PRODUCTION INFORMATION
> **********
> Questions about charges should be sent to Christine Keane
> (ckeane@ametsoc.org).
>
> ----If you are paying your charges in full and submitted your paper before 1
> May 2011, use:
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> If you need further information, please contact:
> Gwendolyn Whittaker, Publications Coordinator, gwhittaker@ametsoc.org
>
>

FW: J. Clim. paper

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Joelle Gergis
Sent: 11 June 2012 16:04
To: David John Karoly; Raphael Neukom [redacted] Steven J Phipps [s.phipps@unsw.edu.au]

From: Eric Steig [steig@uw.edu]
Sent: Saturday, 9 June 2012 8:48 AM
To: Ailie Jane Eyre Gallant
Cc: Joelle Gergis
Subject: Re: J. Clim. paper

Thanks

I should also have said: fee free to ignore me! The rest of the RC gang always assumes our help is needed; sometimes our 'help' doesn't wind up helping as it gives undue attention to minor issues.

Your guys call, entirely!

E

On 6/8/12 3:33 PM, Ailie Jane Eyre Gallant wrote:
> Hi Eric,
>
> I believe Joelle and Raphi are re-running the analysis at the moment. I'm sure they'll have more in the next couple of weeks, but Joelle can confirm.
>
> Cheers,
> Ailie
>
> ---
> From: Eric Steig [steig@uw.edu]
> Sent: Saturday, 9 June 2012 7:36 AM
> To: Joelle Gergis; Ailie Jane Eyre Gallant
> Subject: J. Clim. paper
>
> Joelle (and Ailie),
>
> Annoying about the issue with your paper, which unfortunately I heard about through the climate rumour mill.
>
> Do let me know if we at RealClimate can help in any way with any of this (or if you want to do a guest post, or whatever). I feel compelled to say something brief on our web site since we did highlight the paper and people are asking us about it.
>
> Privately, does it matter in the end (will your results stand, do you think)?
>
> Eric
>
> --
> ~~~~~~~~~~~~~~~~~~~~
> Eric Steig
> IsoLab& Quaternary Research Center
> Department of Earth and Space Sciences

> Box 351310, University of Washington
> Seattle WA 98195
> 206-685-3715
> steig@uw.edu
>
>

--
~~~~~~~~~~~~~~~~~~~~~~
Eric Steig
IsoLab & Quaternary Research Center
Department of Earth and Space Sciences
Box 351310, University of Washington
Seattle WA 98195
206-685-3715
steig@uw.edu
~~~~~~~~~~~~~~~~~~~~~~

71

Re: FW: J. Clim. paper

Raphael Neukom [redacted]
Sent: 11 June 2012 16:4[redacted]
To: Joelle Gergis
Cc: David John Karoly; Steven J Phipps [s.phipps@unsw.edu.au]

Maybe we should explain the RC guys what happened? Not for them to publish it, but so they are aware of what has happened and can be prepared to what is going to happen?
They have commented about the paper so it's also about their credibility
cheers
raphi

Am 11.06.2012 08:04, schrieb Joelle Gergis:

From: Eric Steig [steig@uw.edu]
Sent: Saturday, 9 June 2012 8:48 AM
To: Ailie Jane Eyre Gallant
Cc: Joelle Gergis
Subject: Re: J. Clim. paper

Thanks

I should also have said: fee free to ignore me! The rest of the RC gang always assumes our help is needed; sometimes our 'help' doesn't wind up helping as it gives undue attention to minor issues.

Your guys call, entirely!

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> Hi Eric,
>
> I believe Joelle and Raphi are re-running the analysis at the moment. I'm sure they'll have more in the next couple of weeks, but Joe
>
> Cheers,
> Ailie
>
> ---
> From: Eric Steig [steig@uw.edu]
> Sent: Saturday, 9 June 2012 7:36 AM
> To: Joelle Gergis; Ailie Jane Eyre Gallant
> Subject: J. Clim. paper
>
> Joelle (and Ailie),
>
> Annoying about the issue with your paper, which unfortunately I heard about through the climate rumour mill.
>
> Do let me know if we at RealClimate can help in any way with any of this (or if you want to do a guest post, or whatever). I feel compelled to say something brief on our web site since we did highlight the paper and people are asking us about it.
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> Privately, does it matter in the end (will your results stand, do you think)?
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> Eric
>
> --
> ----------
> Eric Steig
> IsoLab& Quaternary Research Center
> Department of Earth and Space Sciences
> Box 351310, University of Washington
> Seattle WA 98195
> 206-685-3715
> steig@uw.edu

--

Eric Steig
IsoLab & Quaternary Research Center
Department of Earth and Space Sciences
Box 351310, University of Washington
Seattle WA 98195
206-685-3715
steig@uw.edu

--
Raphael Neukom
School of Earth Sciences
University of Melbourne
Victoria 3010, Australia

72

RE: FW: J. Clim. paper

David John Karoly
Sent: 11 June 2012 20:01
To: Raphael Neukom [redacted] Joelle Gergis
Cc: Steven J Phipps [s.phipps@unsw.edu.au]; Ailie Jane Eyre Gallant

Hi Raphi,

I had detailed email exchanges with Mike Mann on Sat morning early in Australia, Friday midday in the US, at the same time as I sent my email to Stephen McIntyre. He passed on the info to Gavin Schmidt and Eric Steig.

Eric did add a post at that time on RC to update their original posting about the paper.

I realise now that I should probably have copied you on my emails to Stephen McI over the weekend, but I wanted to protect you from some of the "..." that is flying around. I will send it to you now. There have been emails from Andy Revkin from teh New York Times and Adam Morton at The Age. Adam will have a short article in the Age tomorrow, to update his piece that covered the original paper at length 3 weeks ago.

There is also an official statement from the University of Melbourne. Please direct any media enquiries about the paper being put on hold to me or to the University of Melbourne media office, or use the statement that I am about to send you.

I strongly recommend against engaging with any blog sites or emails that you may receive, except by sending them the official statement.

Separately, I'll also send an email about possible steps to complete the revised paper.

Best wishes, David

~~~~~~
Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
~~~~~~

From: Raphael Neukom [redacted]
Sent: 11 June 2012 16:49
To: Joelle Gergis
Cc: David John Karoly; Steven J Phipps
Subject: Re: FW: J. Clim. paper

Maybe we should explain the RC guys what happened? Not for them to publish it, but so they are aware of what has happened and can be prepared to what is going to happen?
They have commented about the paper so it's also about their credibility
cheers
raphi

Am 11.06.2012 08:04, schrieb Joelle Gergis:

From: Eric Steig [steig@uw.edu]
Sent: Saturday, 9 June 2012 8:48 AM
To: Ailie Jane Eyre Gallant
Cc: Joelle Gergis
Subject: Re: J. Clim. paper

Thanks

I should also have said: fee free to ignore me! The rest of the RC gang always assumes our help is needed; sometimes our 'help' doesn't wind up helping as it gives undue attention to minor issues.

Your guys call, entirely!

E

On 6/8/12 3:33 PM, Ailie Jane Eyre Gallant wrote:

Hi Eric,

I believe Joelle and Raphi are re-running the analysis at the moment. I'm sure they'll have more in the ne:

Cheers,
Ailie

From: Eric Steig [steig@uw.edu]
Sent: Saturday, 9 June 2012 7:36 AM
To: Joelle Gergis; Ailie Jane Eyre Gallant
Subject: J. Clim. paper

Joelle (and Ailie),

Annoying about the issue with your paper, which unfortunately I heard about through the climate rumour mill.

Do let me know if we at RealClimate can help in any way with any of this (or if you want to do a guest post, or whatever). I feel compelled to say something brief on our web site since we did highlight the paper and people are asking us about it.

Privately, does it matter in the end (will your results stand, do you think)?

Eric

--

Eric Steig
IsoLab& Quaternary Research Center
Department of Earth and Space Sciences
Box 351310, University of Washington
Seattle WA 98195
206-685-3715
steig@uw.edu

--

Eric Steig
IsoLab & Quaternary Research Center
Department of Earth and Space Sciences
Box 351310, University of Washington
Seattle WA 98195
206-685-3715
steig@uw.edu

--
Raphael Neukom
School of Earth Sciences
University of Melbourne
Victoria 3010, Australia

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FW: Statement in response

David John Karoly
Sent: 11 June 2012 20:06
To: Ailie Jane Eyre Gallant; s.phipps@unsw.edu.au
Cc: Joelle Gergis; Raphael Neukom [redacted]

Hi Ailie and Steven,

Apologies for not sending this to you over the weekend. This was sent to Raphi on Friday night, as Joelle was about to go away for the weekend, for a very well deserved break.

This has both the short, approved statement and a longer version, as well as some key points if you need to respond to direct questions.

Best wishes, David

PS Sorry, I should have sent this earlier. I got caught up in the events as they were happenning.

~~~~~~
Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
~~~~~~

From: David John Karoly
Sent: 08 June 2012 17:56
To: Raphael Neukom
Subject: FW: Statement in response

Hi Raphi,

I hope you got some sleep. Joelle is away this weekend and not taking her computer.
As you will have seen from various emails, we have contacted J Climate and asked them to put the paper on hold, and contacted the PAGES 2K group as well.

We have had advice from the media team here at teh University, as well as an independent media advisor.
We have prepared a short statement to be used in response to any questions and to be sent to Stephen McIntyre to go on the ClimateAudit web site. The longer version of the statement is in the email message below.

The short version is

Print publication of scientific study put on hold

An issue has been identified in the processing of the data used in the study, "Evidence of unusual late 20th century warming from an Australasian temperature reconstruction spanning the last millennium" by Joelle Gergis, Raphael Neukom, Stephen

Phipps, Ailie Gallant and David Karoly, accepted for publication in the *Journal of Climate*.

We are currently reviewing the data and results.

Key points: We know there is an issue. The publication is on hold. We are reviewing the data and results. This is a normal part of science.

Hope you are happy with this, David

~~~~~~
Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
~~~~~~

From: Joelle Gergis
Sent: 08 June 2012 16:17
To: David John Karoly
Subject: Re: Statement in response

Print Publication of scientific study put on hold

Publication of a recent scientific study on temperature variations in Australasia over the last thousand years has been delayed. The study, 'Evidence of unusual late 20th century warming from an Australasian temperature reconstruction spanning the last millennium' by Joelle Gergis, Raphael Neukom, Stephen Phipps, Ailie Gallant and David Karoly, was recently accepted for publication in the *Journal of Climate*. An issue has been identified in the processing of the data used in the study, which may affect the results.

While the paper states that "both proxy climate and instrumental data were linearly detrended over the 1921–1990 period", it was discovered on Tuesday 5 June that the records used in the final analysis were not detrended for proxy selection, making this statement incorrect. Although this is an unfortunate data processing issue, it is likely to have implications for the results reported in the study. The journal has been contacted and the publication of the study has been put on hold.

This is a normal part of science. The testing of scientific studies through independent analysis of data and methods strengthens the conclusions. In this study, an issue has been identified and the results are being re-checked.

FW: Print production of scientific study put on hold

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David John Karoly
Sent: 11 June 2012 21:00
To: Joelle Gergis; Raphael Neukom [redacted]

Here is the email I sent to Stephen McIntyre.

~~~~~~
Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
~~~~~~

From: David John Karoly
Sent: 09 June 2012 06:10
To: smcintyre25@yahoo.ca
Subject: Print production of scientific study put on hold

Dear Stephen,

I am contacting you on behalf of all the authors of the Gergis et al (2012) study 'Evidence of unusual late 20th century warming from an Australasian temperature reconstruction spanning the last millennium'

An issue has been identified in the processing of the data used in the study, which may affect the results. While the paper states that "both proxy climate and instrumental data were linearly detrended over the 1921–1990 period", we discovered on Tuesday 5 June that the records used in the final analysis were not detrended for proxy selection, making this statement incorrect. Although this is an unfortunate data processing issue, it is likely to have implications for the results reported in the study. The journal has been contacted and the publication of the study has been put on hold.

This is a normal part of science. The testing of scientific studies through independent analysis of data and methods strengthens the conclusions. In this study, an issue has been identified and the results are being re-checked.

We would be grateful if you would post the notice below on your ClimateAudit web site.
We would like to thank you and the participants at the ClimateAudit blog for your scrutiny of our study, which also identified this data processing issue.

Thanks, David Karoly

Print publication of scientific study put on hold

An issue has been identified in the processing of the data used in the study, "Evidence of unusual late 20th century warming from an Australasian temperature reconstruction spanning the last millennium" by Joelle Gergis, Raphael Neukom, Stephen Phipps, Ailie Gallant and David Karoly, accepted for publication in the *Journal of Climate*.

We are currently reviewing the data and results.

~~~~~~
Prof David Karoly
School of Earth Sciences
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email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
~~~~~~

FW: Print production of scientific study put on hold

75

David John Karoly

Sent: 11 June 2012 21:33
To: Raphael Neukom [redacted]; Joelle Gergis; Ailie Jane Eyre Gallant; s.phipps@unsw.edu.au
Attachments: WahletalScience06.pdf (107 KB) ; MRWA-JGR07.pdf (1 MB)

Hi Raphi and Joelle,

Following some email discussions with Mike Mann and helpful discussions with you both last week, there appear to be several different approaches that we can take with revising the Australasian temp recon paper. I am going to go through some of them briefly, and then raise some suggestions for further data analysis that might be needed.

1. Amend the manuscript so that it states the actual way that the proxy selection was done, based on correls that included trends and were significant at the 5% level. The calibration was also done using the full data variations, including trends, over the calibration period. As Mike Mann says below and in the attached papers, this is a common approach. Don't seriously address the proxy selection for detrended data
2. Revise the manuscript to present results for reconstructions based on both proxy selections for full correls and proxy selections for detrended correls. Expand the paper to show both sets of results and explain why the full correls are better.
3. Redo the analysis for proxy selection based on what the manuscript says, proxy selection based on detrended correls, which gives only about 9 selected proxies and only one prior to 1400. No reliable reconstruction prior to 1400.
4. Redo the analysis based on proxy correlations with local/regional temps at interannual and decadal timescales, not the Australasian area average; select proxies that have strong local temperature signals, then average the proxies to get the area average temperature. This approach is like what Raphi is doing for the SH paper, I think.

My preference is now for 1. or 2. above, and not for 3.

Now for some technical questions.

1. Raphi, did you estimate the significance level of the correlations between the target and the individual proxies allowing for the autocorrelation in the proxies and the reduced degrees of freedom? Some of the comments on the CA web site suggest that they can only get sig correlations for the 27 proxies if you assume 70 degrees of freedom, effectively ignoring autocorrelation. Do you have different values for the sig correlations for each proxy, because the autocorrelation is different for each proxy?
2. In a table like the one you provided last week, can you give for each proxy record, for the 1920-1990 period, the correlation, no.of degrees of freedom and sig level for the full data, detrended data and low pass filtered data. This will help us with proxy selection.
3. It is not surprising that there are many fewer significant correlations for the interannual variations and some are even of the opposite sign for the full correlations. The spatial pattern for the temp response to ENSO, which is the main contributor to Aust temp variations at interannual time scales, is not uniform over Australasia, being quite different in NZ or Law Dome than Australia. Ailie or Raphi, can you do a map using the modern temp data for the correlations of interannual variations of gridded temp data with teh target, area average Australasian temps? Then redo the map for the full data, including the trend. My guess is that teh correlns will be much larger scale for the full data. This will help to explain some of the proxy selection issues for interannual variations.

That's enough for now. I am coming around to the idea that the current analysis is fine, but we need to explain why it is ok to use proxy selection based on teh full temp record, rather than the detrended data.

Best wishes, David

~~~~~~
~~~~~~

Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/

From: Michael Mann [mann@meteo.psu.edu]
Sent: 09 June 2012 06:39
To: David John Karoly
Subject: Re: Print production of scientific study put on hold

Hi David,
Well I'm afraid McIntyre has probably already leaked this anyway. I probably don't have to tell you this, but don't trust him to behave ethically or honestly here, and assume that anything you tell him will be cherry-picked in a way that maximally discredits the study and will be leaked as suits his purposes.

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I will share this w/ Eric and Gavin so they know the status,
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p.s. just a side note. we have found in our own extensive pseudoproxy tests that detrending the data prior to calibration is *not* actually a good idea. See abstract of the '07 JGR article also the attached *Science* comment by Wahl et al. So even if that does change the results, its not obvious that it would be for the better. Just my two cents.

[see attached file: WahletalScience06.pdf] [see attached file: MRWA-JGR07.pdf]

--
Michael E. Mann
Professor
Director, Earth System Science Center (ESSC)

Department of Meteorology
503 Walker Building
The Pennsylvania State University
University Park, PA 16802-5013

Phone: (814) 863-4075
FAX: (814) 865-3663
email: mann@psu.edu
www.michaelmann.net

"The Hockey Stick and the Climate Wars": www.thehockeystick.net
"Dire Predictions": www.direpredictions.com

Comment on "Reconstructing Past Climate from Noisy Data"

Eugene R. Wahl,[1]* David M. Ritson,[2] Caspar M. Ammann[3]

von Storch *et al.* (Reports, 22 October 2004, p. 679) criticized the ability of the "hockey stick" climate field reconstruction method to yield realistic estimates of past variation in Northern Hemisphere temperature. However, their conclusion was based on incorrect implementation of the reconstruction procedure. Calibration was performed using detrended data, thus artificially removing a large fraction of the physical response to radiative forcing.

Retention of century-scale temperature variations in proxy-based climate reconstructions is important for understanding real-world natural climate variability and to estimate climate sensitivity. Both are fundamental benchmarks for climate model simulations used to examine human-induced climate change. A recent study by von Storch *et al.* (VS04) (*1*) purported to apply "as realistically as possible" the methodology of Mann *et al.* (MBH) (*2*, *3*) to reconstruct Northern Hemisphere surface temperatures from climate model output. Comparing these emulated reconstructions [based on pseudoproxy data constructed by adding white noise to European Centre Hamburg 4–Hamburg Ocean Primitive Equation–G (ECHO-G) surface temperatures at MBH proxy sites] to the actual model temperatures, VS04 found that the MBH-style reconstructions underestimated the amplitude of true simulated northern hemisphere temperatures by a factor of up to three or more [figure 2A in (*1*); the exact factor depends on the amount of noise included in the pseudoproxies.]. VS04 thus reasoned that MBH could have systematically underestimated past temperature excursions by similar factors. This critique has assumed political importance, being cited in a congressional inquiry concerning the MBH reconstruction (*4*). It has gone unnoted that the VS04 analysis differed critically from the procedures used by MBH, which bears directly on the validity of the VS04 critique.

MBH (see Fig. 1A) calibrated proxies against time series of dominant instrumental temperatures patterns over 1902 to 1980 in a procedure guaranteeing (by construction) retention of sample mean and variance, and thus the calibration period trend (*2*, *3*). MBH additionally validated the reconstructions over an independent time span, 1854 to 1901 (called the "verification" period) (*2*, *3*), during which at least mean (low-frequency) tracking of instrumental temperatures must also be demonstrated. Figure 1B shows the corresponding VS04 results, with two pseudoproxy-based estimates of the true model temperatures. The "75% noise" curve is the case from VS04 [figure 2A in (*1*)] that shows proxy-based reconstructions underestimating the amplitude of true ECHO-G temperatures by more than a factor of three. Although there is strong agreement in MBH between observed and reconstructed temperatures in the 1902 to 1980 calibration period, and good performance in capturing mean temperature during the verification period (Fig. 1A), the results in VS04 are very different (Fig. 1B). Large, systematic amplitude losses appear between the reconstructed and true (simulated) temperatures over both the calibration and verification periods, even though their temporal structures remain similar. In fact, the VS04 results could be closely mimicked by applying scaling factors to the ECHO-G output that reflect the amounts of noise added to construct the pseudoproxies—factors the MBH method would necessarily assimilate in calibration. The systematic amplitude losses in calibration and verification in VS04 indicate highly unsuccessful validation, which would have led to dismissal of the reconstruction results in a real-world paleoclimate analysis and clearly demonstrate a fundamental discrepancy from the MBH algorithm. Therefore, the VS04 results (*1*) cannot speak to the question of whether (and if so, why) the MBH procedure causes large losses of low frequency variability in climate reconstruction.

A later 2005 conference report by Zorita and von Storch (ZVS05) (*5*) acknowledged that VS04 had altered the MBH procedure to base their reconstructions on detrended data, training the model on year-to-year variability. ZVS05 showed results for the same analysis using non-detrended data, which calibrate and verify far more realistically [figure 3 in (*5*)]. These results indicate still some, but much smaller, amplitude loss in the MBH method, at most ~0.2° for the perfect pseudoproxy case (which VS04 suggest shows loss of low frequency variance "induced by the method alone"), in relation to a total excursion of ~1.3° over the 1000-year simulation.

What causes the difference in the VS04/ZVS05 results, and is it indeed "statistically prudent" (ZVS05) to use detrended data for calibration [see also various experiments in (*6*)]? Calibration with detrended data artificially dampens low-frequency climate variations and largely removes effects from the most fundamental physical processes responsible for climatic changes. The MBH reconstruction recombines spatial modes of temperature variability, called "empirical orthogonal functions" or EOFs, which (more or less, given orthogonality) represent physical processes. Some modes can directly influence global/hemispheric mean temperature, e.g., the phase of El Niño–Southern Oscillation (mostly contained in EOF2 in MBH), whereas others are of more regional importance. But over past centuries and the millennium, and particularly over the 20th century, global and hemispheric temperature changes are not simply due to a recombination of internal modes of variability but largely result from externally imposed perturbations to the planet's energy balance (*7*). The 20th century warming "trend," at its core, contains necessary information for the reconstruction algorithm to identify the climate system's primary response to large-scale radiative forcing. Removing this physical process (contained in MBH EOF1) effectively dismisses a large portion of the central physical mechanism necessary to represent climate in both preindustrial and recent times.

Statistically, the MBH procedure allows a century-scale trend (such as the radiatively induced warming trend, or a possible linear component in the trend contributed by any other physical mode of variability) to be mathematically separated from other climatic variations. The proxy series will still calibrate against, and add weight to, all of the EOFs retained in the reconstruction with which they have a relationship. Detrending is therefore not statistically required, and in fact, will artificially dampen low-frequency signals associated with any mode of variability that contributes to EOF1 in MBH.

The VS04 results have been interpreted to cast serious doubt on the MBH reconstruction. [Note that a newer method has since been presented and evaluated (*8*, *9*).] However, these results are in large part dependent on a detrending step not used by MBH, which is physically inappropriate and statistically not required. The take-away message for the climate community should be strong encouragement for more vigorous cross-comparisons of the various reconstruction implementations, based on real-world proxy series, model emulations, and simulated modifications to real-world data. Such a step would help eliminate unnecessary confusion that can distract from the crucial contributions of climate change research to important scientific and policy questions.

[1]Environmental Studies and Geology Division, Science Center, Alfred University, Alfred, NY 14802, USA. [2]Physics Department, Stanford University, Stanford, CA 94305, USA. [3]Climate and Global Dynamics Division, National Center for Atmospheric Research, Boulder, CO 80307, USA.

*To whom correspondence should be addressed. E-mail: wahle@alfred.edu

Re: FW: Print production of scientific study put on hold

76

Raphael Neukom [redacted]
Sent: 11 June 2012 22:43
To: David John Karoly
Cc: Joelle Gergis; Ailie Jane Eyre Gallant; s.phipps@unsw.edu.au

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Thanks and cheers
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Raphael Neukom
School of Earth Sciences
University of Melbourne
Victoria 3010, Australia

RE: FW: Print production of scientific study put on hold

77

David John Karoly
Sent: 12 June 2012 06:55
To: Raphael Neukom [redacted]
Cc: Joelle Gergis; Ailie Jane Eyre Gallant; s.phipps@unsw.edu.au

Hi Raphi,

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Raphael Neukom
School of Earth Sciences
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RE: Newsroom updated

78

David John Karoly
Sent: 12 June 2012 07:20
To: John Dubois; Diane Squires; Rebecca Scott
Cc: Joelle Gergis

Hi,

Adam Morton has a short article on this issue in The Age this morning.
http://www.theage.com.au/environment/climate-change/climate-warming-study-put-on-hold-20120611-2065y.html

Best wishes, David

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From: John Dubois
Sent: 11 June 2012 14:46
To: Diane Squires; Rebecca Scott; David John Karoly
Subject: Newsroom updated

Dear all, the media release on the UoM Newsroom website has been updated with the explanatory note we agreed on and I've advised all the people who wrote to us about it that we've done that.

If you get other queries, you may wish to do the same.

I've also advised the Vice-Chancellor as he may get some of the messages.

Cheers.

John

RE: FW: Print production of scientific study put on hold

79

Ailie Jane Eyre Gallant
Sent: 12 June 2012 07:58
To: David John Karoly; Raphael Neukom [redacted]
Cc: Joelle Gergis; s.phipps@unsw.edu.au

Hi all,

David/Joelle, thanks for all the correspondence re the paper. I think you're all doing a fantastic job of dealing with everything (which ordinarily wouldn't be an issue I suspect, it's just the subject matter). So keep up the good work.

Raphi/David, I Can do on those maps. But, just to clarify:

You want two maps of the correlations between a) Australasian area-averaged temperature (land & ocean) b) Grid point temperatures within the Australian domain (using Sept-Feb data from 1920-1990 from the HadCRUT3 and/or HadCRUT4).

The first map will show these correlations between the **raw** anomalies (i.e. with variations of all time scales still included - in other words NO detrending).

The second map will show these correlations between **linearly detrended** anomalies (i.e. both the target - Aust area-average temps AND the grid points will be detrended using linear regression(??) -is this what you used in the paper, I can't remember).

If that's correct let me know and I'll make them tomorrow.

Just for the record I think David will be correct. Given the large trends in temp anomalies across much of the domain I think you'll see stronger and more consistent correlations across most of the domain using the raw anomalies. Detrending will be much more spatially variable and some areas will be quite different.

Raphi/Joelle - are the HadCRUT3 and/or HadCRUT4 still on Pandora?

Cheers,
Ailie

From: David John Karoly
Sent: Tuesday, 12 June 2012 6:55 AM
To: Raphael Neukom
Cc: Joelle Gergis; Ailie Jane Eyre Gallant; s.phipps@unsw.edu.au
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mike

p.s. just a side note. we have found in our own extensive pseudoproxy tests that detrending the data prior to calibration is *not* actually a good idea. See abstract of the '07 JGR article also the attached *Science* comment by Wahl et al. So even if that does change the results, its not obvious that it would be for the better. Just my two cents.

[see attached file: WahletalScience06.pdf] [see attached file: MRWA-JGR07.pdf]

--
Michael E. Mann
Professor
Director, Earth System Science Center (ESSC)

Department of Meteorology
503 Walker Building
The Pennsylvania State University
University Park, PA 16802-5013

Phone: (814) 863-4075
FAX: (814) 865-3663
email: mann@psu.edu
www.michaelmann.net

"The Hockey Stick and the Climate Wars": www.thehockeystick.net
"Dire Predictions": www.direpredictions.com

--

Raphael Neukom
School of Earth Sciences
University of Melbourne
Victoria 3010, Australia

thanks again.

Andrew Revkin [redacted]
Sent: 12 June 2012 08:39
To: David John Karoly

80

herewith

June 11, 2012, 6:12 PM

Australian Warming, Hockey Sticks and Open Review

By ANDREW C. REVKIN

A much-cited study (paper here) concluded last month that the extent of warming in Australia in recent decades was so great compared to climate variations in the last millennium that it had to be mainly the result of warming from the human-driven buildup of greenhouse gases in the atmosphere. (Here's a video interview from May with the lead author, Joëlle Gergis from the University of Melbourne.)

It's the latest research in more than a decade of work producing a climate "hockey stick" — graphs of global or regional temperatures showing relatively little variation over a millennium or more and then a sharp uptick since the middle of the twentieth century (the blade at the end of the stick).

Now the paper, at the request of the authors, has been "put on hold" by the Journal of Climate after questions were raised publicly about one of the researchers' methods, starting with a comment on Steve McIntyre's Climate Audit blog. This field of study uses sophisticated statistical methods to derive meaning from scattered and variegated indirect indicators of past temperature — with tree rings being the most familiar example.

It is unclear whether the problem will affect the study's conclusions. Depending on the result, readers of the initial burst of news could end up with a familiar sense of whiplash.

To see how quickly the research results made the rounds, check the headlines here. My unfavorite would be "IT'S OFFICIAL: Australia is warming and it is your fault," in the Herald Sun. This is a classic case of what I've been calling "single-study syndrome," the bias in the news process toward the "front-page thought" and tendency to forget that science is a herky-jerky process.

Over the weekend, I got in touch with David Karoly, one of the paper's authors and a longtime contact on climate science, to confirm the accuracy of a post by McIntyre quoting him. He said all was accurate, adding this noted about the review of the work: Read more...

--

ANDREW C. REVKIN
Dot Earth blogger, The New York Times
http://www.nytimes.com/dotearth
Senior Fellow, Pace Acad. for Applied Env. Studies
Cell: 914-441-5556 Fax: 914-989-8009
Twitter: @revkin Skype: Andrew.Revkin

RE: FW: Print production of scientific study put on hold

David John Karoly
Sent: 12 June 2012 08:57
To: Ailie Jane Eyre Gallant; Raphael Neukom [redacted]
Cc: Joelle Gergis; s.phipps@unsw.edu.au

81

Hi Ailie,

Yes, the correlation maps are just as you describe. Please check the manuscript for the exact start and end dates of the calibration period. I think that year 1 starts Sept 1920-Feb 1921 and year 70 is Sept 89- Feb 1990, but Raphi or Joelle could confirm that. Also, you are probably better to use HadCRUT3 temps, as that was what the paper used, I think. The HadCRUT4 temps have more SH data coverage, but won't make much difference.

Thanks for doing this, David

~~~~~~
Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
~~~~~~

From: Ailie Jane Eyre Gallant
Sent: 12 June 2012 07:58
To: David John Karoly; Raphael Neukom
Cc: Joelle Gergis; s.phipps@unsw.edu.au
Subject: RE: FW: Print production of scientific study put on hold

Hi all,

David/Joelle, thanks for all the correspondence re the paper. I think you're all doing a fantastic job of dealing with everything (which ordinarily wouldn't be an issue I suspect, it's just the subject matter). So keep up the good work.

Raphi/David, I Can do on those maps. But, just to clarify:

You want two maps of the correlations between a) Australasian area-averaged temperature (land & ocean) b) Grid point temperatures within the Australian domain (using Sept-Feb data from 1920-1990 from the HadCRUT3 and/or HadCRUT4).

The first map will show these correlations between the **raw** anomalies (i.e. with variations of all time scales still included - in other words NO detrending).

The second map will show these correlations between **linearly detrended** anomalies (i.e. both the target - Aust area-average temps AND the grid points will be detrended using linear regression(??) -is this what you used in the paper, I can't remember).

If that's correct let me know and I'll make them tomorrow.

Just for the record I think David will be correct. Given the large trends in temp anomalies across much of the domain I think you'll see stronger and more consistent correlations across most of the domain using the raw anomalies. Detrending will be much more spatially variable and some areas will be quite different.

Raphi/Joelle - are the HadCRUT3 and/or HadCRUT4 still on Pandora?

Cheers,
Ailie

From: David John Karoly
Sent: Tuesday, 12 June 2012 6:55 AM
To: Raphael Neukom
Cc: Joelle Gergis; Ailie Jane Eyre Gallant; s.phipps@unsw.edu.au
Subject: RE: FW: Print production of scientific study put on hold

Hi Raphi,

Thanks for your email. There is no great urgency to get this done. I recommend that you and Joelle work on it when you are together when Joelle visits later this month.

Ailie, I think that you have looked at some of the teleconnection patterns in your own JClim paper.
Can you have a look at responding to item 3. in the technical questions below? I suggest that you use gridded HadCRUT3 or HadCRUT4 monthly temp data for the same period as the paper, 1920-90 (I think) Sept-Feb average, and calculate the correlations of each grid box with the Australasian region area average for detrended data and for the full data. The correlations should be for the larger region that includes the locations of all teh proxies considered.

Thanks, David

~~~~~~
Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
~~~~~~

From: Raphael Neukom [redacted]
Sent: 11 June 2012 22:43
To: David John Karoly
Cc: Joelle Gergis; Ailie Jane Eyre Gallant; s.phipps@unsw.edu.au
Subject: Re: FW: Print production of scientific study put on hold

Hi David,

Thanks for these suggestions. I've also discussed this with David Frank today and he has very similar suggestions.
If possible we should do point 1 below in the main manuscript and include points 2 and 4 in the supplementary section with a brief discussion of the issue.

To the technical questions:
1. We did not take autocorrelations into account fot Australasia (but I did for the SH). If I do so for Australasia (using the formula of Stevens JoC manuscript) about 22 out of the 27 proxies that we used remain in the proxy set (calculated last week under time pressure).
2. I will provide this table (but I am not sure whether I can make it in the next few days).

3. This is a very good idea. Ailie can you do this? I can also try but only with the (target) grid as I don't have access to all the newest station data from the region.

Thanks and cheers
Raphi

Am 11.06.2012 13:33, schrieb David John Karoly:

Hi Raphi and Joelle,

Following some email discussions with Mike Mann and helpful discussions with you both last week, there appear to be several different approaches that we can take with revising the Australasian temp recon paper. I am going to go through some of them briefly, and then raise some suggestions for further data analysis that might be needed.

1. Amend the manuscript so that it states the actual way that the proxy selection was done, based on correls that included trends and were significant at the 5% level. The calibration was also done using the full data variations, including trends, over the calibration period. As Mike Mann says below and in the attached papers, this is a common approach. Don't seriously address the proxy selection for detrended data
2. Revise the manuscript to present results for reconstructions based on both proxy selections for full correls and proxy selections for detrended correls. Expand the paper to show both sets of results and explain why the full correls are better.
3. Redo the analysis for proxy selection based on what the manuscript says, proxy selection based on detrended correls, which gives only about 9 selected proxies and only one prior to 1400. No reliable reconstruction prior to 1400.
4. Redo the analysis based on proxy correlations with local/regional temps at interannual and decadal timescales, not the Australasian area average; select proxies that have strong local temperature signals, then average the proxies to get the area average temperature. This approach is like what Raphi is doing for the SH paper, I think.

My preference is now for 1. or 2. above, and not for 3.

Now for some technical questions.

1. Raphi, did you estimate the significance level of the correlations between the target and the individual proxies allowing for the autocorrelation in the proxies and the reduced degrees of freedom? Some of the comments on the CA web site suggest that they can only get sig correlations for the 27 proxies if you assume 70 degrees of freedom, effectively ignoring autocorrelation. Do you have different values for the sig correlations for each proxy, because the autocorrelation is different for each proxy?
2. In a table like the one you provided last week, can you give for each proxy record, for the 1920-1990 period, the correlation, no.of degrees of freedom and sig level for the full data, detrended data and low pass filtered data. This will help us with proxy selection.
3. It is not surprising that there are many fewer significant correlations for the interannual variations and some are even of the opposite sign for the full correlations. The spatial pattern for the temp response to ENSO, which is the main contributor to Aust temp variations at interannual time scales, is not uniform over Australasia, being quite different in NZ or Law Dome than Australia. Ailie or Raphi, can you do a map using the modern temp data for the correlations of interannual variations of gridded temp data with teh target, area average Australasian temps? Then redo the map for the full data, including the trend. My guess is that teh correlns will be much larger scale for the full data. This will help to explain some of the proxy selection issues for interannual variations.

That's enough for now. I am coming around to the idea that the current analysis is fine, but we need to explain why it is ok to use proxy selection based on teh full temp record, rather than the detrended data.

Best wishes, David

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Prof David Karoly
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~~~~~~

From: Michael Mann [mann@meteo.psu.edu]
Sent: 09 June 2012 06:39
To: David John Karoly
Subject: Re: Print production of scientific study put on hold

Hi David,
Well I'm afraid McIntyre has probably already leaked this anyway. I probably don't have to tell you this, but don't trust him to behave ethically or honestly here, and assume that anything you tell him will be cherry-picked in a way that maximally discredits the study and will be leaked as suits his purposes.

We have simply noted at RC in the comments that the paper does appear to have been retracted from the AMS website, and we have no further information as to why.
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p.s. just a side note. we have found in our own extensive pseudoproxy tests that detrending the data prior to calibration is *not* actually a good idea. See abstract of the '07 JGR article also the attached *Science* comment by Wahl et al. So even if that does change the results, its not obvious that it would be for the better. Just my two cents.

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"Dire Predictions": www.direpredictions.com

--
Raphael Neukom
School of Earth Sciences
University of Melbourne
Victoria 3010, Australia

82

[redacted]
Sent: 12 June 2012 11:05
To: David John Karoly

Hi Professor Karoly

I wrote an article for [redacted] about the paper Evidence of Unusual Late 20th Century Warming from an Australasian Temperature Reconstruction Spanning the Last Millenium and I was hoping to check with you the accuracy of this post on the Climate Audit blog.

I'm sure you've received many inquiries over this already -- my apologies for adding another -- but I was hoping you could explain in layman's terms what you mean when you say records were not "detrended for proxy selection". How important is this to the data process? And is it possible to say when this issue will be clarified?

Many thanks,

--

[redacted]
[redacted] from outside Australia)

Re: FW: Print production of scientific study put on hold

Steven J Phipps [s.phipps@unsw.edu.au]

Sent: 12 June 2012 13:51
To: Raphael Neukom[redacted]
Cc: David John Karoly; Joelle Gergis; Ailie Jane Eyre Gallant

83

Hi all,

I appreciate that my opinion wasn't being explicitly solicited on this, but I do have thoughts and so I hope you don't mind if I share them. I'm actually on leave this week, so you'll also have to forgive me if I raise issues without having fully reviewed the appropriate literature first.

On the issue of detrending: it strikes me that, on balance, it is preferable if this is NOT done. While I understand that anthropogenic trends will inflate correlation coefficients, this can be dealt with by allowing for autocorrelation when assessing significance. If any linear trends ARE removed when validating individual proxies, then the validation exercise will essentially only confirm the ability of the proxies to reconstruct interannual variations. That's fine if that's what we want to reconstruct, but in an exercise of this nature we are also interested in reconstructing longer-term trends. It therefore appears to be preferable to leave any trends in the data, so that we are also assessing the ability of the proxies to reconstruct this information.

I realise that both approaches have been widely used in the past, and that both are supported in the literature. Thus I believe that either approach is entirely justifiable. Based on the various emails circulated over the past few days, it appears that we will not have a viable millennial-scale reconstruction if we pursue the detrended approach. I therefore feel that we should use the raw data to validate the proxies. From Raphi's email, this will leave 22 of the 27 proxies in the reconstruction once autocorrelation is taking into account. This should mean that the final reconstruction will not change significantly. To address debate over this issue, we should also present results for the detrended approach in the Supplementary Material.

My preference is therefore for David's Option 2, with Option 1 as my second choice. I dislike Option 3 as it will not leave us with a viable reconstruction. I also dislike Option 4 as it strikes me as essentially starting again from scratch - which seems unnecessary given how far this work has already progressed, and also seems out of proportion to what is only a matter of fixing a technical issue.

Thank you for cc'ing me in this, and I would appreciate it if I could continue to be cc'ed in all technical correspondence. As a co-author on this study, I naturally have a strong interest in this. These issues are also directly relevant to two other manuscripts that I am working on currently.

Also, one question: which is the single proxy prior to 1400 which survives under the detrended approach?

Good luck with your continuing efforts on this, and please don't be shy about asking me if there's anything I can do to help.

Steven

> Hi David,

> Thanks for these suggestions. I've also discussed this with David Frank
> today and he has very similar suggestions.
> If possible we should do point 1 below in the main manuscript and include
> points 2 and 4 in the supplementary section with a brief discussion of the
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> ~~~~~~
> Prof David Karoly
> School of Earth Sciences
> University of Melbourne, VIC 3010, AUSTRALIA
> ph: +61 3 8344 4698
> fax: +61 3 8344 7761
> email: dkaroly@unimelb.edu.au
> http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
> ~~~~~~
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> ---
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> Sent: 09 June 2012 06:39
> To: David John Karoly
> Subject: Re: Print production of scientific study put on hold
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> --
> Michael E. Mann
> Professor
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> Department of Meteorology Phone: (814) 863-4075
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>
> "The Hockey Stick and the Climate Wars": www.thehockeystick.net "Dire
> Predictions": www.direpredictions.com
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> --
> Raphael Neukom
> School of Earth Sciences
> University of Melbourne
> Victoria 3010, Australia
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>

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Dr Steven J Phipps

Climate Change Research Centre
ARC Centre of Excellence for Climate System Science

Faculty of Science
University of New South Wales
UNSW Sydney
NSW 2052
Australia

Tel +61 2 9385 8957
Fax +61 2 9385 8969

http://www.stevenphipps.com

84

Fwd: climate paper

Joelle Gergis
Sent: 12 June 2012 13:59
To: David John Karoly; Rebecca Scott
Attachments: ole1.bmp (1 KB) ; ole0.bmp (646 B) ; ole4.bmp (4 KB) ; ole3.bmp (12 KB) ; ole2.bmp (458 B)

Sent from my iPhone

Begin forwarded message:

From: [redacted]@theaustralian.com.au>
Date: 12 June 2012 1:56:05 PM AEST
To: <jgergis@unimelb.edu.au>
Subject: climate paper

Dear Dr Gergis,
I'm writing for tomorrow's paper about the withdrawal of the reconstructed temperatures journal article on which you were lead author. I'd like to ask you about this.
regards,

[redacted]
The Australian
Level 2, 2 Holt Street, Surry Hills, NSW, 2010
T: +61 2 9288 2551
E: [redacted]@theaustralian.com.au http://www.theaustralian.com.au/subscribe http://twitter.com/#!/australian
http://pages.e.newsdigitalmedia.com.au/GPC?a=TheAustralian

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climate paper

[redacted]@theaustralian.com.au]
Sent: 12 June 2012 14:00
To: David John Karoly

85

Dear Professor Karoly,
I'm writing about the status of the multi-author paper on reconstructed temperatures. I'd like to ask you about this.

[redacted]
The Australian
Level 2, 2 Holt Street, Surry Hills, NSW, 2010
T: +61 2 9288 2551
E: [redacted]theaustralian.com.au http://www.theaustralian.com.au/subscribe http://twitter.com/#!/australian
http://pages.e.newsdigitalmedia.com.au/GPC?a=TheAustralian
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RE: climate paper

86

David John Karoly
Sent: 12 June 2012 15:04
To: Rebecca Scott; Joelle Gergis

Hi,

As I said to Rebecca, I have just had a 45 min conversation with [redacted], Aust Higher Ed supplement. I do not want to talk to [redacted] had no background, wanted to start again on what the original paper said, etc etc.

It is much better for us that [redacted] covers this than [redacted]

Best wishes, David

~~~~~~
Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
~~~~~~

From: Rebecca Scott
Sent: 12 June 2012 14:29
To: Joelle Gergis
Cc: David John Karoly
Subject: Re: climate paper

Thanks Joelle. David will you get back to [redacted]? I have had a call from [redacted] at the Australian.

Rebecca

Sent from my iPhone

On 12/06/2012, at 1:59 PM, "Joelle Gergis" <jgergis@unimelb.edu.au> wrote:

> Sent from my iPhone
>
> Begin forwarded message:
>
> **From:** [redacted]@theaustralian.com.au>
> **Date:** 12 June 2012 1:56:05 PM AEST
> **To:** <jgergis@unimelb.edu.au>
> **Subject: climate paper**

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regards,

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http://twitter.com/#!/australian http://pages.e.newsdigitalmedia.com.au/GPC?a=TheAustralian

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<ole1.bmp>

<ole0.bmp>

<ole4.bmp>

<ole3.bmp>

<ole2.bmp>

87

Re: climate paper and the Australian

Rebecca Scott
Sent: 12 June 2012 15:28
To: David John Karoly
Cc: Diane Squires; John Dubois

HI David, [redacted] (sorry I said [redacted] earlier) has rung and left me another message. I have sent him the link to the statement on our newsroom and told him you were speaking to [redacted]

Any thoughts on how to handle this now? Fending him off a good idea?

Cheers
R

On 12/06/12 3:04 PM, "David John Karoly" <dkaroly@unimelb.edu.au> wrote:

> Hi,
>
> As I said to Rebecca, I have just had a 45 min conversation with [redacted] Aust Higher Ed supplement. I do not want to talk to [redacted] had no background, wanted to start again on what the original paper said, etc etc.
>
> It is much better for us that [redacted] covers this than [redacted]
>
> Best wishes, David
>
> ~~~~~~
> **Prof David Karoly**
> School of Earth Sciences
> University of Melbourne, VIC 3010, AUSTRALIA
> ph: +61 3 8344 4698
> fax: +61 3 8344 7761
> email: dkaroly@unimelb.edu.au
> http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
> <http://www.earthsci.unimelb.edu.au/%7Edkaroly/wp/>
> ~~~~~~

From: Rebecca Scott
Sent: 12 June 2012 14:29
To: Joelle Gergis
Cc: David John Karoly
Subject: Re: climate paper

Thanks Joelle. David will you get back to [redacted]? I have had a call from [redacted] at the Australian.

Rebecca

Sent from my iPhone

On 12/06/2012, at 1:59 PM, "Joelle Gergis" <jgergis@unimelb.edu.au> wrote:

Sent from my iPhone

Begin forwarded message:

From: [redacted]@theaustralian.com.au>
Date: 12 June 2012 1:56:05 PM AEST
To: <jgergis@unimelb.edu.au>
Subject: climate paper

Dear Dr Gergis,

I'm writing for tomorrow's paper about the withdrawal of the reconstructed temperatures journal article on which you were lead author. I'd like to ask you about this.

regards,

[redacted]
The Australian
Level 2, 2 Holt Street, Surry Hills, NSW, 2010
T: +61 2 9288 2551
E: [redacted]theaustralian.com.au
http://www.theaustralian.com.au/subscribe
<http://www.theaustralian.com.au/subscribe>
http://twitter.com/#!/australian <http://twitter.com/#!/australian>
http://pages.e.newsdigitalmedia.com.au/GPC?a=TheAustralian
<http://pages.e.newsdigitalmedia.com.au/GPC?a=TheAustralian>
<http://www.theaustralian.com.au>
<http://www.1degree.com.au/>

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Rebecca Scott | Senior Media Officer | University Communications
Telephone +61 3 8344 0181 | **Mobile** +61 417 164 791 | **Email** rebeccas@unimelb.edu.au
Web newsroom.melbourne.edu | **Facebook** facebook.com/melbuni |
Twitter twitter.com/uommedia

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Re: climate paper and the Australian

Rebecca Scott
Sent: 12 June 2012 15:48
To: David John Karoly
Cc: Diane Squires; John Dubois

Thanks David

Di and John have reinforced that we have now done the Australian – via [redacted]
(was just checking on what to do with two requests from the Aus)

Cheers
Rebecca

On 12/06/12 3:28 PM, "Rebecca Scott" <rebeccas@unimelb.edu.au> wrote:

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> Cheers
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http://twitter.com/#!/australian
<http://twitter.com/#!/australian>
http://pages.e.newsdigitalmedia.com.au/GPC?a=TheAustralian
<http://pages.e.newsdigitalmedia.com.au/GPC?a=TheAustralian>
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Twitter twitter.com/uommedia

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Twitter twitter.com/uommedia

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RE: Print production of scientific study put on hold

[redacted]@theaustralian.com.au]
Sent: 12 June 2012 16:52
To: David John Karoly

ps, David,

Has the team identified how this mistake in data processing happened (I understand the wish not to identify the team member/s immediately responsible.)

regards, [redacted]

From: David John Karoly [mailto:dkaroly@unimelb.edu.au]
Sent: Tuesday, 12 June 2012 4:44 PM
To: [redacted]
Subject: FW: Print production of scientific study put on hold

Dear [redacted]

Sorry for the delay in sending you the email below, which I had sent to Stephen McIntyre, on Saturday morning.

Best wishes, David

~~~~~~
Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
http://www.earthsci.unimelb.edu.au/~dkaroly/wp/
~~~~~~

From: David John Karoly
Sent: 09 June 2012 06:10
To: smcintyre25@yahoo.ca
Subject: Print production of scientific study put on hold

Dear Stephen,

I am contacting you on behalf of all the authors of the Gergis et al (2012) study 'Evidence of unusual late 20th century warming from an Australasian temperature reconstruction spanning the last millennium'

An issue has been identified in the processing of the data used in the study, which may affect

the results. While the paper states that "both proxy climate and instrumental data were linearly detrended over the 1921–1990 period", we discovered on Tuesday 5 June that the records used in the final analysis were not detrended for proxy selection, making this statement incorrect. Although this is an unfortunate data processing issue, it is likely to have implications for the results reported in the study. The journal has been contacted and the publication of the study has been put on hold.

This is a normal part of science. The testing of scientific studies through independent analysis of data and methods strengthens the conclusions. In this study, an issue has been identified and the results are being re-checked.

We would be grateful if you would post the notice below on your ClimateAudit web site. We would like to thank you and the participants at the ClimateAudit blog for your scrutiny of our study, which also identified this data processing issue.

Thanks, David Karoly

Print publication of scientific study put on hold

An issue has been identified in the processing of the data used in the study, "Evidence of unusual late 20th century warming from an Australasian temperature reconstruction spanning the last millennium" by Joelle Gergis, Raphael Neukom, Stephen Phipps, Ailie Gallant and David Karoly, accepted for publication in the *Journal of Climate*.

We are currently reviewing the data and results.

~~~~~~
Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
email: dkaroly@unimelb.edu.au
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RE: Print production of scientific study put on hold

David John Karoly
Sent: 12 June 2012 16:58
To: [redacted]@theaustralian.com.au]

No, I think that it was just an oversight, as you mentioned in our phone conversation, I think.

There is a switch in the computer code that allows one or the other method to be used. It was not noticed that this switch was set differently than the method that was described in the manuscript. It was associated with an early part of the data processing and many of the later choices and parts were doubl-checked.

Best wishes, David

~~~~~~
Prof David Karoly
School of Earth Sciences
University of Melbourne, VIC 3010, AUSTRALIA
ph: +61 3 8344 4698
fax: +61 3 8344 7761
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