

From: [Raphael Neukom](#)
To: [Raphael Neukom](#)
Subject: Southern Hemisphere proxy review paper published
Date: Thursday, 22 December 2011 22:12:30 PM
Attachments: [Neukom Gergis 2011.pdf](#)

Dear colleagues,

Please find attached our new paper published in The Holocene, OnlineFirst:

Neukom, R. and Gergis, J. (2011): Southern Hemisphere high-resolution palaeoclimate records of the last 2000 years, The Holocene, DOI: 10.1177/0959683611427335

Please note that tables 5-12 (denoted as "available online" in the text) are appended at the end of the attached pdf for your convenience.

Many thanks to all of you who contributed proxy data and made this publication possible!

cheers and happy holidays

Raphael

--

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

From: [Raphael Neukom](#)
To: [Janice Lough](#)
Subject: Re: time series
Date: Tuesday, 17 August 2010 15:25:53 PM
Attachments: [SSA_mean_Recon_DJF_900-1901-1995_PCR.txt](#)
[PCR_Recon_JJA_SSA-mean_1706-1901-1995.txt](#)
[SSA_mean_PP_Recon_JJA_1590-1995.txt](#)
[SSA_mean_PP_Recon_DJF_1498-1995.txt](#)

Dear Janice,

Here you go, all values are anomalies (relative to 1901-1995 for temperature and relative to 1931-1995 for precip.).

Sorry about the messy filenames:

SSA_mean_Recon_DJF_900-1901-1995_PCR.txt: Summer temperature reconstruction AD 900-1995

PCR_Recon_JJA_SSA-mean_1706-1901-1995.txt: Winter temperature reconstruction AD 1706-1995

SSA_mean_PP_Recon_DJF_1498-1995.txt: Summer precipitation reconstruction 1498-1995

SSA_mean_PP_Recon_JJA_1590-1995.txt: Winter precipitation reconstruction 1498-1995

Any questions about the data or if you need something else, just let me know.

Cheers,
Raphael

Janice Lough schrieb:

Hi Raphael

Thanks I really only need the spatially averaged annual time series – the NE Qld rainfall reconstruction is for the summer half of the year (Oct-Mar) – so definitely the summer series & also just the winter if that was possible. Thanks that would be great.

Maybe I didn't go deep enough into the NOAA site as I just thought I saw the spatial reconstructions.

Thanks & best wishes

Janice

Janice M. Lough
Senior Principal Research Scientist
Australian Institute of Marine Science
PMB 3, Townsville MC
Queensland 4810
Australia

email: j.lough@aims.gov.au
Tel: (07) 47 534248
Fax: (07) 47 725852
Mobile: 0438970999

From: Raphael Neukom [<mailto:rneukom@unimelb.edu.au>]
Sent: Tuesday, 17 August 2010 10:10 AM
To: Janice Lough
Subject: Re: time series

Dear Janice,

No problem with providing my reconstruction data (they are also available at the NOAA Paleo Database).

Just to make sure I send you the right things:

You are interested in the southern South American mean reconstruction time series (spatial average), right?

I reconstructed precip and temperature for both summer and winter. Should I send you the seasonal recons or do you prefer an annual averages?

Very interesting, I am looking forward to see the results!

Cheers,
Raphael

Janice Lough schrieb:
Hi Raphael

I wonder if you could help me with provision of some time series data from your recent GRL (S Am rainfall) & Climate Dynamics (S Am T) papers.

I am finalising my paper on reconstruction of NE Australia tropical summer rainfall back to 1685. I am working on a table that compares available SH proxies/reconstructions for 3 sub-periods that appear significantly different in my reconstruction: 1685-1764, 1765-1855 & 1856-1900. It would be neat if I could also include the time series from your SH reconstructions.

Full acknowledgement would be given but OK if not possible.

Thanks & best wishes

Janice

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From: Raphael Neukom
To: Janice Lough
Subject: Re: time series
Date: Tuesday, 17 August 2010 10:13:46 AM

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I reconstructed precip and temperature for both summer and winter. Should I send you the seasonal recons or do you prefer an annual averages?

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From: [Raphael Neukom](#)
To: [Janice Lough](#)
Cc: [Joelle Gergis](#)
Subject: Re: GBR coral records
Date: Wednesday, 28 July 2010 13:22:17 PM

Dear Janice,

Thanks a lot for your very helpful advice and data! Thanks to this our database is now up to date and we can start working with the data. Once you are happy with providing the quantitative luminescence indices, we would be extremely interested in getting them.

As you suggested, the next step for us will be to screen the relationship of the records with our targets for different seasonal/annual windows.

Best wishes

Raphael

Janice Lough schrieb:

Hi Raphael & Joelle

Thanks for your email & glad to hear things are progressing.

<!--[if !supportLists]-->1) <!--[endif]-->Attached file "river reconstructions" contains the separate 4 rivers reconstructions that were used to develop the "all rivers/qld rainfall" reconstructions in the 2007 paper. I am not sure that the individual core data will be of much use as they are simply assessments of luminescence intensity on a scale from 0-3 (with the new reconstruction I am writing up, I will be able to provide quantitative annual luminescence indices for each core used in the reconstruction – working towards submission within the next month so will let you know as soon as I am comfortable with releasing that data).

<!--[if !supportLists]-->2) <!--[endif]-->The only long O18 or Sr/Ca data for the GBR are the 5-yr average series of Hendy et al and Calvo et al – not sure whether that resolution would fit into your scheme?

<!--[if !supportLists]-->3) <!--[endif]-->The annual d18O record of Druffell et al 1999 just dropped off my radar when I was doing the 2004 paper – so there was no reason for it's exclusion.

<!--[if !supportLists]-->4) <!--[endif]-->Attached Excel file contains a list of published coral O18 records from the western Pacific and Indian Oceans that I have been messing around with recently – not for reconstruction purposes – but I presume that you are aware of all these? The sheet with correlations with SSTs is just for annual average data – a mixed bag and also does not preclude, for those series with sufficient sampling resolution, different responses between, for example, summer & winter (see Table 4 in Lough (2004)) – which might be worth teasing out before you go into reconstruction mode (though you are probably ahead of me on this!).

Hope this helps

Best wishes

Janice

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From: Raphael Neukom [<mailto:rneukom@unimelb.edu.au>]
Sent: Tuesday, 27 July 2010 17:07 PM
To: Janice Lough
Cc: Joelle Gergis
Subject: GBR coral records

Dear Janice,

We would like to get back to you with a few questions:

We have now established a database with proxy data that may be potentially used in our reconstructions. In terms of coral data we ended up with the records listed in the attached table.

Now as there are many good records from the Great Barrier Reef, we think it may be better to not use many single-site datasets but one or a few composite(s) of high quality records. An idea would be to use the luminescence series that you used in your 2007 Paleocceanography paper for the streamflow reconstructions and build the composites based on the groups you used for the different rivers (or build our own composites based on the correlations with our reconstruction targets).

Do you think this is reasonable, and if yes would you mind to provide the luminescence series you've used (we found only the reconstructed streamflow values, but not the coral data at the NOAA database)?

Do you think it makes sense to - in addition to the luminescence series - include other proxy data from the GBR that may be more SST-related, such as oxygen isotopes or Sr/Ca? If yes, what dataset would you recommend to use?

Finally, we've come across the $\delta^{18}\text{O}$ record from Abraham Reef (Druffel 1999 and others;
ftp://ftp.ncdc.noaa.gov/pub/data/paleo/coral/west_pacific/great_barrier/abraham1999iso.txt
) . We find that you were not using this record, so we'd like to ask whether you have a comment about it and would recommend to use it or not.

Sorry for bothering you again with so many questions, but we really want to make sure that we use reliable datasets and your expert judgement is certainly the best way to achieve this.

Thanks a lot and best regards

Raphael

Janice Lough schrieb:
Dear Joelle & Raphael

Thank you for your emails & glad to help where I can. Yes, please keep me informed about progress. I am likely to pester you for any up-to-date stuff early next year as I've

been invited to give a keynote on paleo work at Greenhouse 2011 next April – it would seem a good opportunity to advertise Aus2K work etc.

Best wishes

Janice

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From: Joelle Gergis [<mailto:jgergis@unimelb.edu.au>]
Sent: Thursday, 15 July 2010 11:24 AM
To: Janice Lough
Cc: Raphael Neukom
Subject: Re: Advice on coral data

Thanks very much for your thoughts and those papers Janice.

I particularly appreciate your comments on the reliability of some of the records that are available. This is exactly why I thought to contact you!

We will take another careful look through the NOAA database to make sure we haven't missed anything. Sounds like you have some great work in progress, it would be good to hear about it when you are ready. No problem at all using the Lough (2007) paper as I think we should stick to published records.

I agree it is an ambitious project but I think a preliminary look at eastern and western Pacific records is a nice collaboration between the Aus2K and the South American groups. Who knows what we will see but it is worth a try. Happy to keep you posted as things progress.

Thanks again for your help with this.

All the best

Joelle

--

Dr Joelle Gergis
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Fax: +61 3 834 47761
Mobile: + 61 415 449 241
<http://climatehistory.com.au>

On 14/07/10 5:56 PM, "Janice Lough" <J.Lough@aims.gov.au> wrote:

Hi Joelle & Raphael

Thanks for your email and apologies for the delay in replying - actually been in Melbourne talking to fish biologists!

An ambitious project!

1) as to Australian coral records - I am pretty sure I included those that are available in my Aus2k talk - 5-yr Sr/Ca & O18 from Eva Calvo and Erica Hendy's work; Kuhnert et al's Ningaloo & Houtman O18; Ellen Druffel's annual Abraham Reef O18 - all captured in NOAA's paleoclimate data base. The only other one I can think of is in the attached Wei et al (2009) paper - again 5-yr & single coral. Unfortunately, when I messed around with the data I could not identify, for example, a temperature signal in the Sr/Ca series - so probably not very helpful. I have copies of a couple of Sr/Ca & O18 series that Malcolm McCulloch produced a few years ago - very puzzling as not climate signal and hence never published (though there probably still is a story there as to why no signal.....).

2) I am pretty sure that NOAA's database is up-to-date with all the published coral records from around the world that I am aware of (it should also have Jens's data).

3) Feel embarrassed that I haven't progressed with writing up my new tropical QLD rainfall reconstruction from coral luminescence - as based on measured rather than visual assessment, it is more reliable & more robust. OK to use the Lough (2007) reconstruction but, if you don't mind, I would like to hold off distributing the new version till I have at least submitted the paper.

4) Am currently involved in a collaboration with Sandy Tudhope & Julian Sachs (Univ Washington) re reconstructing Pacific climate variability using mollusks, sediments & corals. As part of that Sandy has just done O18 analyses on a Moorea core and has will be doing the same for 2 of our longest cores from the southern GBR and an offshore reef in the central GBR.....so, hopefully more to come.

5) A couple of queries/comments for Raphael - think you have done excellent work but would question use of some coral records (cf Frank et al "noodle" paper) that you included in the S American work. First, the McCulloch et al Ba/Ca series from the central GBR is a terrestrial sediment tracer which has a strong human imprint ~1870 due to European settlement and land clearing..... Second, the C13 record from Kuhnert's work in the Houtman Abrolhus - C13 records in corals are notorious for our lack of understanding of what they mean and do not seem to have a clear and consistent climate signal.....Third, Brad Linsley's Raratonga Sr/Ca series shows an apparent decline in SSTs ~2-3C over a matter of months in the early part of the record. In the attached paper (Linsley et al 2006) they note this and lack of consistency with new Fiji records and that the 1726-1760 part of the Raratonga record should not be considered reliable.

Also attached a useful review paper for coral O18 which you may or may not have come across.

Hope this helps & best wishes

Janice

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Senior Principal Research Scientist
Australian Institute of Marine Science
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Queensland 4810, Australia

e-mail: j.lough@aims.gov.au
Tel: 07 47 534 248

From: Joelle Gergis [jgergis@unimelb.edu.au]
Sent: Tuesday, 13 July 2010 11:37 AM
To: Janice Lough
Cc: Raphael Neukom
Subject: Advice on coral data

Hi Janice

It was good to catch up with you in Melbourne recently, thanks for making the effort to be involved.

As mentioned at the Aus2K workshop, we have Raphael Neukom a Swiss researcher working with our group in Melbourne at the moment. He did the multi proxy analysis for the PAGES 2K South American group (I've attached two of his papers here for you).

He is currently on a Swiss NSF-funded 1 yr post-doc based here for 6 months and with Rosanne D'Arrigo's group at LDEO for the remaining 6 months. The plan is to see what's possible in terms of capturing broad scale Southern Hemisphere SLP and SST patterns associated with ENSO and SAM. These spatial field reconstructions will then be compared to model output.

As a first step, we are in the process of merging our data in a database to store and query the records for subsequent climate analysis.

The database includes a function to export this information into the PAGES Aus2K metadatabase format which only has two records in it at the moment:

<http://www.pages-igbp.org/cgi-bin/WebObjects/metadb.woa/wa/group?group=aus2k>

We have gone through the NOAA WDC and collected all the long records we could find from the Pacific and I contacted Jens Zinke recently for Indian Ocean records.

In terms of Australian coral data, we are only using your 2007 composite river flow and rainfall reconstructions from the GBR (1631-2005), because we know it has been carefully screened.

Are there other published records from the Australian coast that we should be using?

If so, and the records are not publically available, would you be interested in collaborating with us on this?

When you get a chance, we'd really appreciate your advice.

I hope all is well with you,

Joelle

--

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From: [Raphael Neukom](#)
To: [Janice Lough](#)
Cc: [Joelle Gergis](#)
Subject: GBR coral records
Date: Tuesday, 27 July 2010 17:07:25 PM
Attachments: [Coral_Records.xls](#)

Dear Janice,

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Now as there are many good records from the Great Barrier Reef, we think it may be better to not use many single-site datasets but one or a few composite(s) of high quality records. An idea would be to use the luminescence series that you used in your 2007 Paleocceanography paper for the streamflow reconstructions and build the composites based on the groups you used for the different rivers (or build our own composites based on the correlations with our reconstruction targets).

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Best wishes

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All the best

Joelle

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To: Janice Lough
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Joelle

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From: [Raphael Neukom](#)
To: [Janice Lough](#)
Subject: Re: Advice on coral data
Date: Thursday, 15 July 2010 13:16:54 PM

Dear Janice,

Thank you very much for your detailed and very helpful update/comments! We will go carefully through all the records again and select the reliable and suitable ones for our purposes. Fortunately, the mentioned coral records did not have much influence on our S American reconstructions, so the inconsistencies could probably not significantly bias the results. However, I appreciate your comments very much and reckon that there is a lot of space for improvement of our results.

Thanks and best wishes,
Raphael

Janice Lough schrieb:

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An ambitious project!

1) as to Australian coral records - I am pretty sure I included those that are available in my Aus2k talk - 5-yr Sr/Ca & O18 from Eva Calvo and Erica Hendy's work; Kuhnert et al's Ningaloo & Houtman O18; Ellen Druffel's annual Abraham Reef O18 - all captured in NOAA's paleoclimate data base. The only other one I can think of is in the attached Wei et al (2009) paper - again 5-yr & single coral. Unfortunately, when I messed around with the data I could not identify, for example, a temperature signal in the Sr/Ca series - so probably not very helpful. I have copies of a couple of Sr/Ca & O18 series that Malcolm McCulloch produced a few years ago - very puzzling as not climate signal and hence never published (though there probably still is a story there as to why no signal.....).

2) I am pretty sure that NOAA's database is up-to-date with all the published coral records from around the world that I am aware of (it should also have Jens's data).

3) Feel embarrassed that I haven't progressed with writing up my new tropical QLD rainfall reconstruction from coral luminescence - as based on measured rather than visual assessment, it is more reliable & more robust. OK to use the Lough (2007) reconstruction but, if you don't mind, I would like to hold off distributing the new version till I have at least submitted the paper.

4) Am currently involved in a collaboration with Sandy Tudhope & Julian Sachs (Univ Washington) re reconstructing Pacific climate variability using mollusks, sediments & corals. As part of that Sandy has just done O18 analyses on a Moorea core and has will be doing the same for 2 of our longest cores from the southern GBR and an offshore reef in the central GBR.....so, hopefully more to come.

5) A couple of queries/comments for Raphael - think you have done excellent work but would question use of some coral records (cf Frank et al "noodle" paper) that you included in the S American work. First, the McCulloch et al Ba/Ca series from the central GBR is a terrestrial sediment tracer which has a strong human imprint ~1870 due to European settlement and land clearing..... Second, the C13 record from Kuhnert's work in the Houtman Abrolhus - C13 records in corals are notorious for our lack of understanding of what they mean and do not seem to have a clear and consistent climate signal..... Third, Brad Linsley's Raratonga Sr/Ca series shows an apparent decline in SSTs ~2-3C over a matter of months in the early part of the

record. In the attached paper (Linsley et al 2006) they note this and lack of consistency with new Fiji records and that the 1726-1760 part of the Raratonga record should not be considered reliable.

Also attached a useful review paper for coral O18 which you may or may not have come across.

Hope this helps & best wishes

Janice

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From: Joelle Gergis [jgergis@unimelb.edu.au]
Sent: Tuesday, 13 July 2010 11:37 AM
To: Janice Lough
Cc: Raphael Neukom
Subject: Advice on coral data

Hi Janice

It was good to catch up with you in Melbourne recently, thanks for making the effort to be involved.

As mentioned at the Aus2K workshop, we have Raphael Neukom a Swiss researcher working with our group in Melbourne at the moment. He did the multi proxy analysis for the PAGES 2K South American group (I've attached two of his papers here for you).

He is currently on a Swiss NSF-funded 1 yr post-doc based here for 6 months and with Rosanne D'Arrigo's group at LDEO for the remaining 6 months. The plan is to see what's possible in terms of capturing broad scale Southern Hemisphere SLP and SST patterns associated with ENSO and SAM. These spatial field reconstructions will then be compared to model output.

As a first step, we are in the process of merging our data in a database to store and query the records for subsequent climate analysis.

The database includes a function to export this information into the PAGES Aus2K metadatabase format which only has two records in it at the moment:

<http://www.pages-igbp.org/cgi-bin/WebObjects/metadb.woa/wa/group?group=aus2k>

We have gone through the NOAA WDC and collected all the long records we could find from the Pacific and I contacted Jens Zinke recently for Indian Ocean records.

In terms of Australian coral data, we are only using your 2007 composite river flow and rainfall reconstructions from the GBR (1631-2005), because we know it has been carefully screened.

Are there other published records from the Australian coast that we should be using?

If so, and the records are not publically available, would you be interested in collaborating with us on this?

When you get a chance, we'd really appreciate your advice.

I hope all is well with you,

Joelle

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