From: Stuart Stothoff
Sent: Wednesday, August 23, 2006 10:01 AM
To: Randall Fedors
Cc: Eugene Peters
Subject: RE: met and PDO

Randy

The met data is under N:\\sstothoff\Request 0418-1.

As I understand the proposed linkage between the PDO and El Nino, it's kind of like an aliasing thing. The idea was that a deep pool of water exchanges with the surface waters during part of the year, so it only gets part of the signal that the surface water gets. Presumably if communication were year-round, the El Nino oscillations would have a much longer period due to greater capacitance. So we observe two signals, the PDO and El Nino. I'll try and dig up this paper.

stu

-----Original Message-----
From: Randall Fedors [mailto:RWF@nrc.gov]
Sent: Wednesday, August 23, 2006 5:40 AM
To: sstothoff@cnwra.swri.edu
Cc: Eugene Peters
Subject: Re: Behl and Kennett 1996

Stu,

I've heard the hot and dry over the past 5,000 yrs for YM, but I knew this was not consistent with the ususal definition for the Holocene Epoch (i.e., past 10,000 yrs). At one time, I had both time frames in the abstract just to be clear.

Your right about the "near" YM stations. I think I will refer to them as the YMP stations. Then the NOAA (up to 100 yrs) and NTS (generally approximately 50-yr records) stations will be the "other" stations.
I will try to add a link to the SBB data, something in terms of generic supporting data (e.g., such as ...).

I thought the PDO periodicity was multi-decadel (two, maybe three, cycles expressed in many meteorological station/sea surface P ot T data records. If so, then the periodicity of the ENSO (3 to 7 year cycles) seems inconsistent with the exchange of water idea. During periods of negative PDO indices (I think I remember that right), the El Ninos are significantly enhanced. I noted a change for the southern Nevada stations that coincided with the PDO signal. Are they now questioning the multi-decadal periodicity of the PDO?

--Randy

>>> Stuart Stothoff <sstothoff@cnwra.swri.edu> 08/22/2006 5:09 PM >>>

Randy

Regarding the abstract:
* I think that hot and dry applies over about 8 or 11 ky, not 5 ky
* NTS met stations have been online since 1959 - is this "near" Yucca Mountain?
* There is some yakking about how tree rings are anomalously large in the last few decades, which may be due to increased atmospheric CO2.
* The record I have for the bristlecone rings is through 1978 (a few years after this are present with just a few samples)
* We may wish to consider cores from the Santa Barbara Basin as well as tree rings (see below)

I modified the abstract slightly (attached), but didn't put in the Santa Barbara Basin idea.

I was just given a CD with measured precipitation records from Yucca Mountain that you requested in April as information request 0418-01. The documentation suggests that you request it to be sent to NRC headquarters. I presume that you obtained a CD as well?

I put a document Behl_Kennett9601.pdf in the N: drive, regarding the Santa Barbara Basin (SBB). This is interesting from the standpoint of the last 8000 yr in Figure 2. The attached figure uses this information. The wiggles in the bioturbation index seem to qualitatively correspond to the bristlecone record, although I have yet to plot them head-to-head. I understand from Kennett that they have done some comparisons with a good match for the last 3000 yr, with a paper in press or on the way. I am going to try and obtain the bioturbation index data from Behl.

The bioturbation index is an indicator of benthic activity, with warm temperatures making the sediment anoxic and allowing varves to be preserved. Linkage between the ocean and terrestrial signatures is a good confirmation of the tree ring signal. Note that the literature shows an oscillation on a 1000- to 2000-yr frequency that seems to correspond to periods of El Nino and La Nina dominance, and this shows up in the bioturbation index.

I don't know if it would be appropriate to try and link in SBB information to the abstract to buttress the tree ring idea. The nice thing about the SBB cores are that they indicate that variability seen in the tree rings for the Holocene is anticipated to occur even under glacial conditions, although frequency seems to slow as conditions become cooler.

I seem to remember coming across a document that suggests the cyclicity may come from alternating salinity transfers between the Atlantic and Pacific.

An additional source of information that we may want to tap into (but not promise in the abstract) comes from the packrat middens. I've obtained a version of the database, with 800 to 900 samples from across the SW. Just looking at the database, the middens seem to give a blurred picture, since in the cases where multiple C14 dates are obtained they usually do not agree. For example, in one case 5 dates ranged from about 9600 to 12600 ka for different subsamples from the same sample. This may make it difficult to interpret millenial-scale signals.

I also note in passing that one explanation for the Pacific Decadal Oscillation is that it is simply a reddened El Nino signal. The thought is that deep waters are isolated from the surface waters for part of the year and in communication other parts, thus imparting a persistence that manifests as the PDO.

stu

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Email Number: 1275

Mail Envelope Properties (1FA53ADF29758448974A8AC1118E627EA23FB6F99E)

Subject: RE: met and PDO
Sent Date: 8/23/2006 10:00:42 AM
Received Date: 8/23/2006 10:00:00 AM
From: Stuart Stothoff

Created By: sstothoff@cnwra.swri.edu

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Tracking Status: None

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Files	**Size**	**Date & Time**
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