

2 KYR PROJECT MEETING SUMMARY TUCSON, 15 MAY 2006

Participants: Abbott, Mark; Besonen, Mark; Bird, Broxton; Conroy, Jessica; Duvall, Matt; Francus, Pierre; Hu, Feng Sheng; Hughen, Konrad; Kathan, Kasey; Kaufman, Darrell; Larsen, Darren; Otto-Bleisner, Bette; Overpeck, Johnathan; Schiff, Caleb; Retelle, Mike; Werner, Al

Summary: The following is a summary of the one-day PI workshop held in Tucson on May 15, 2006. It is being distributed to all collaborators and students whose e-mail addresses were forward to me by PIs. This report includes an update on the status of each of the 30 study lakes. Please let me know if you have any information to add to the lake status report, or names to the e-mail distribution list.

Eight PIs and eight collaborators/students met to review progress and discuss synthesis strategies, including potential climate-modeling designs. Discussion focused on lakes with annually resolved records, and the PI workshop was followed by a one-day meeting to explore new software and analytical approaches currently being developed for studying laminated lake sediment by the VARVES group at the University of Arizona and by Francus' group in Quebec.

Preliminary synthesis: The PIs agreed that the first attempt to pull together a synthesis for this project will be in one year (spring 2007). All PIs should plan to have preliminary datasets available to contribute at that time. Priority will be on the 400-year-long interval between 850 and 1250 AD. This period is probably the longest interval of relative warmth during the last 2 kyr and is bounded by pronounced cooling events, which might help to synchronize our records; it will also be a focus of our GCM experiments. Please make a strong effort to complete geochronological and proxy analyses at the highest-possible resolution over this interval of your lake records during the coming year.

GCM experimental design (from Bette): We discussed two approaches to achieving our goals. First a simulation with CCSM for the past 2000 years is desirable. This will allow the long time series to be put into a temporal perspective and would extend through the 20th century. This simulation is already scheduled as part of the CCSM Paleoclimate Working Group computer allocation. Computing costs make running multiple simulations for the past 2000 years prohibitive. Alternatively, simulations for the past 2000 years could be coordinated among multiple modeling groups to use the same forcings for this time period. Second, we discussed focusing on a shorter time period to allow multiple simulations. The ensemble approach using best estimates of the solar, volcanic, and other forcings would allow an assessment of the internal versus forced variability. Additional simulations would allow us to determine the sensitivity of the Arctic regional response to uncertainties in the solar and volcanic reconstructions and the implementations of these forcings in CCSM. The PIs agreed to focus on the warm period during the so-called Medieval Warm Period from about 850 to 1250 AD. The spatial and temporal coherence, or lack there of, of a Medieval Warm Period is of considerable importance. Using the low-resolution version of CCSM, we can reasonably expect to get computing time for about 7 runs.

Postdoc position: An advertisement for a climate-modeler postdoc position for this project will be posted soon. All PIs should encourage qualified applicants to contact Bette about this opportunity.

Progress at study lakes: No PI has yet developed a new time series of calibrated climate from a laminated lake. A few are close, but most records will ultimately afford only indices of summer warmth or effective moisture. PIs at the meeting or who otherwise contacted me reported the following progress/status at their lakes:

- Birch: Pollen analysis completed at 17yr resolution to 500 yr
- Blue: Varve-thickness record completed to 1400 yr; will be extended to 2000 yr; calibration will be difficult at this high-elevation lake.
- C2: New cores will be recovered during 2006; prospect temperature calibration presently unclear.
- Cape Hurd: 600 yr varve-thickness record is complete and will be extended to 2000 yr; prospect temperature calibration presently unclear.
- Cascade: Origin of laminations is currently unclear; BSi seems to covary with summer temperature over instrumental period.
- CF3: Chironomid-based temperatures completed at millennial scale.
- CF8:
- Como: Isotopic analyses are pending for this closed-basin lake; a multi-decadal-scale record of P-E is expected.
- Depot: Laminated record extends to 3500 yr BP; last 60 yr is missing; prospects for temperature calibration is presently unclear.
- Donard: Varve-thickness and composition record will extend to 1250 yr BP; good candidate for calibration against local instrumental record, possibly rainfall influenced.
- Greyling: Laminations are visible on core face, but thin sections show diffuse layering unsuited for further analyses. Efforts will shift to Hallet Lake this summer (2006)
- Haukadalsvatn: TOC and BSi analyses will be completed at ca. 8 yr intervals over last 2000 yr.
- Hudson:
- Hvitvatn: Laminations are annual with 3-part varve; thickness of winter clay cap is correlated with summer air temperature; 2000 yr record will be completed by end of 2007.
- Kekertalujuak:
- Linne: Analyses focused on surface cores and modern lake processes; a 2000 yr record of varve thickness is expected with hope of calibration against instrumental data.
- Ltla/Stora Vadarvatn:
- Moose: Chironomid-based summer temperatures at multi-decadal resolution is complete to 1200 yr; will extend to 2000 yr.
- Murray: Varve thickness, grain size, and chironomid analyses are in progress for 2000 yr; calibration will be hampered by missing the last few decades of sediment.
- Ogaq: Thin sectioning is complete; potential for temperature calibration not yet known.
- Omega:
- S42:
- Sawtooth: Varve thickness back to 2600 yr and grain size to 1000 yr.
- Squanga Lake: Isotopic analyses are pending for this closed-basin lake; a multi-decadal-scale record of P-E is expected.

- Sven: Chironomid-based temperatures completed at millennial scale; pollen analysis underway
- Toby:
- Tugtutog: Microlimited; ^{14}C chronology completed; chironomid analyses pending
- Tukahula: Isotope analyses at ~ 50 yr resolution completed to 2000 yr
- Twin: abandoned and replaced by Hudson
- V57:
- White Cap:

