



ICDP Workshop on Scientific Drilling:

PlioWest: Drilling Pliocene Lakes in Western North America

Virtual Working Group meetings in August-September followed by an In-Person and Virtual workshop, September 23-26, 2021 at CSDCO and LacCore, Minneapolis, Minnesota, USA

Recent studies suggest that the Pliocene Epoch was warmer and largely wetter, at least in the subtropics, than today, which contrasts with the long term hydroclimatic response of drying conditions seen in most climate model simulations. Two features of Pliocene warmth identified from sea-surface temperature (SST) reconstructions could bring about atmospheric circulation changes that may have supported wetter conditions in western North America (WNA) and other Mediterranean-like climates of subtropical drylands across the globe: 1) a weaker than present-day Pliocene zonal gradient in SST between the western and eastern equatorial Pacific, resembling El Niño-like conditions; and 2) polar-amplified Pliocene warmth supporting a weaker equator-to-pole temperature gradient between the tropics and the mid-latitudes, as this controls Hadley strength. The distribution and seasonality of wet conditions in WNA and the timing of late Plio-Pleistocene aridification allow evaluation of these two mechanisms.

Why the Pliocene was warmer and, in some regions, wetter than conditions predicted for the end of this century is a scientifically challenging question with important societal implications. We propose to address this question by turning to the unique and hitherto under-recognized Pliocene lake basins of WNA. The proposed drilling sites are the only location in the world where several Pliocene lake basins are distributed along a latitudinal arrangement in a subtropical - Mediterranean-like climate region. responding to Pacific forcing. The proposed drill sites (Butte Valley, Tule Lake, Summer Lake, Lake Idaho, Searles Lake and Blythe Basin) are also unique as these large basins contained deep freshwater lakes during the Pliocene Epoch. Continuous, new sedimentary records from four selected Pliocene lake basins in WNA compared with existing Pacific SST records will allow us to test hypotheses about Pliocene hydroclimatic conditions, providing understanding for globally distributed subtropical regions with Mediterranean-like climates. Although the goal of this project is not to reconstruct tectonic changes, we will evaluate the sensitivity of the sedimentary records to changes in basin connectivity, hydrology and uplift-related changes in rain shadows.

Due to the global pandemic, this workshop will be virtual and in-person, and it is critical for attendees to be aware of travel restrictions, both traveling to the U.S. and then returning to their home countries (see U.S. State Department [website](#) and your country's restrictions). Adapting to ongoing pandemic constraints, workshop delivery will be virtual as a series of working group discussions with plenary sessions over 7- 8 weeks throughout August and September, 2021, and will then provide a three day in-person workshop (with some virtual delivery) to be held September 23-26 at CSD and LacCore, Minneapolis, Minnesota, USA for those able to attend. The virtual working groups and plenary sessions will be time-zone adjusted to accommodate attendees. Conveners of this workshop include: Alison Smith, Emi Ito, Natalie Burls, David McGee, Peter Molnar, Steve Kuehn, Blas Valero Garcés, Alexander Prokopenko, and Tim Lowenstein.

Scientists wishing to contribute to this workshop are invited to apply with contact details, a 1-page CV, and a 1-page summary of their relevant expertise and intended project contribution to Alison Smith, alisonjs@kent.edu prior to **August 6, 2021**. A scientific committee will decide on invitations and travel support (fully or partially) for the in-person portion of the workshop, taking into account the relevance of the applicants' research relevant to the goals of the workshop, the workshop budget, and the need for balanced disciplines. Early career scientists and scientists from ICDP member countries are encouraged to apply.