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Paper #165331

CHRONOLOGY OF HIGH LAKE LEVELS AT MONO LAKE DURING THE LAST GLACIAL CYCLE

ALI, Guleed A.H.[1], ZIMMERMAN, Susan H.[2], HEMMING, Sidney R.[3], COX, Stephen E.[3], LEROY, Sverre L.[4], STEPONAITIS, Elena A.[3], and WANG, Xianfeng[5], (1) Department of Geosciences, University of Arizona, Gould-Simpson Building #77, 1040 E 4th St, Tucson, AZ 85721, guleed@email.arizona.edu, (2) Center for Accelerator Mass Spectrometry, Lawrence Livermore National Laboratory, Livermore, CA 94550, (3) Department of Earth and Environmental Sciences and Lamont-Doherty Earth Observatory of Columbia University, Palisades, NY 10964, (4) Dept of Chemistry and Physics, Mills College, 5000 MacArthur Blvd, Oakland, CA 94613, (5) Department of Geology and Geophysics, Univeristy of Minnesota, 310 Pillsbury Dr. SE, Minneapolis, MN 55455

Mono Lake, the western-most of the Quaternary Great Basin lakes, shows evidence for past lake level fluxes from basin-wide terraces. Currently, the lake spills at 2196 m, and the highest level from the last glacial cycle is 2155 m (current level is 1945 m). Further evidence of high lake levels during the last glacial cycle comes from the distribution of tufa towers and of deep lake sediments from the Wilson Creek Formation (WCF).

Based on the mapped distribution of the WCF (Lajoie, 1968, UC Berkeley Ph.D.), the highest lake level of the last glacial cycle was attained during the deposition of volcanic ash package A (rhyolitic ashes 1, 3 and 4, and basaltic ash 2). The high lake levels during package A follow an anomalous dry period observed in the WCF stratigraphy between Ash 4 and Ash 5 (23.1 ± 1.2 ka; Chen et al. 1996, Science). $^{40}Ar/^{39}Ar$ measurements of sanidine crystals from Ash 4 yield a minimum age population of 16.6 ± 0.7 ka, thus constraining the beginning of the lake level rise during Package A.

Package A is capped by a layer of lacustrine silt containing fans of thinolite crystals, which are pseudomorphs from the metastable cold water mineral ikaite. Six new ^{14}C measurements on thinolite crystals from the top of the WCF yield ages of ~10.5-10.7 ^{14}C kyr BP. This result is consistent with the estimated thinolite ^{14}C age of ~9.5 ^{14}C kyr BP based on plant macrofossils from a core in the western embayment (Davis, 1999, Quat. Res.), if the reservoir age was ~1 kyr in the lake as it is today. If WCF thinolite can be correlated to the thinolite found in the core, an extensive thinolite-forming event occurred during the Younger Dryas (11.5-12.9 ka).

In addition to the stratigraphic occurrence of thinolite, numerous tufa mounds with this texture have also been documented at different elevations. To test if all the thinolite formed in the Mono Basin occurred during the Younger Dryas, we measured ^{14}C ages from two thinolitic tufa mounds. One mound (2081 m) from the NE Mono Basin yielded an age of 12.8 ^{14}C kyr BP. A second mound (1955 m) just east of Black Point contains 19 layers, which yielded ^{14}C ages indicating a long

interval of tufa formation during much of the last glacial interval. If all the outcrops of thinolite were coeval, the thinolite ^{14}C ages may indicate potential complications, which need further study.

Abstract ID#: 165331
Password: 268378
Meeting: 2009 Portland GSA Annual Meeting (18-21 October 2009)
Session Type: Topical/Theme
Selection: T35. Cenozoic Lakes (Posters)
Title: CHRONOLOGY OF HIGH LAKE LEVELS AT MONO LAKE DURING THE LAST GLACIAL CYCLE
Key Words: Mono Lake
Presentation Format: Poster
Discipline Categories: Quaternary Geology, Geochemistry (Ungraded), Paleoclimatology/Paleoceanography (Ungraded)

Scheduled For:
Presentation Date: Wednesday, 21 October 2009
Presentation Time: 9:00 AM

Abstract Submission Fee: Paid (gsa-2009AM-8098-1367-7527-1292)

First Author

Student Presenting
Guleed A.H. Ali
(Undergraduate student)
Department of Geosciences, University of Arizona
Gould-Simpson Building #77
1040 E 4th St
Tucson, AZ 85721

Office Phone: (520) 621-6000
Email: guleed@email.arizona.edu
Confirmation Email: guleed@email.arizona.edu
Abstract book page: 656

Second Author

Susan H. Zimmerman
Center for Accelerator Mass Spectrometry, Lawrence Livermore National Laboratory
Livermore, CA 94550
Office Phone: 925.422.8462
Email: zimmerman17@llnl.gov
Abstract book page: 656

Third Author

Sidney R. Hemming
Department of Earth and Environmental Sciences and Lamont-Doherty Earth Observatory of Columbia University, Palisades, NY 10964

Office Phone: 845-365-8417
Email: sidney@ldeo.columbia.edu
Abstract book page: 656

Fourth Author

Stephen E. Cox
Department of Earth and Environmental Sciences and Lamont-Doherty Earth Observatory of Columbia University, Palisades, NY 10964
Office Phone: 845-365-8844
Fax Number: 845-365-8155
Email: cox@ldeo.columbia.edu
Confirmation Email: cox@ldeo.columbia.edu
Abstract book page: 656

Fifth Author

Sverre L. LeRoy
(Undergraduate student)
Dept of Chemistry and Physics, Mills College
5000 MacArthur Blvd
Oakland, CA 94613
Office Phone: (510) 430-2317
Email: sleroy@mills.edu
Abstract book page: 656

Sixth Author

Elena A. Steponaitis
(Undergraduate student)
Department of Earth and Environmental Sciences and Lamont-Doherty Earth Observatory of Columbia University, Palisades, NY 10964
Office Phone: (845) 365-8844
Email: es2596@barnard.edu
Abstract book page: 656

Seventh Author

Xianfeng Wang
Department of Geology and Geophysics, Univeristy of Minnesota

310 Pillsbury Dr. SE
Minneapolis, MN 55455

Office Phone: 612-624-1333
Email: wang0452@umn.edu
Abstract book page: 656