

OSL Geochronology Results for the Panguitch Lake Quadrangle, Utah

by

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Bibliographic citation for this data report:

Utah Geological Survey and Utah State University Luminescence Laboratory, 2013, OSL geochronology results for the Panguitch Lake quadrangle, Utah: Online, Utah Geological Survey Open-File Report 622, variously paginated, <<http://geology.utah.gov/online/ofr/ofr-622.pdf>>.



OPEN-FILE REPORT 622
UTAH GEOLOGICAL SURVEY
a division of
Utah Department of Natural Resources
2013

INTRODUCTION

This open-file report makes available raw analytical data from laboratory procedures completed to determine the age of a sediment sample collected during geologic investigations funded or partially supported by the Utah Geological Survey (UGS). The reference listed in table 1 generally provides additional information such as sample location, geologic setting, and significance or interpretation of the samples in the context of the area where they were collected. This report was prepared by Utah State University Luminescence Laboratory under contract to the UGS. These data are highly technical in nature and proper interpretation requires considerable training in the applicable geochronologic techniques.

The data and methods are available at http://geology.utah.gov/online/analytical_data.htm:

Table 1. Sample number and location.

Sample #	7.5' quadrangle	UTM Easting NAD83-12	UTM Northing NAD83-12	Reference
PL090109-1	Panguitch Lake	348527	4169280	Biek and others (2012)

DISCLAIMER

This open-file release is intended as a data repository for information gathered in support of various UGS projects. The data are presented as received from Utah State University Luminescence Laboratory and do not necessarily conform to UGS technical, editorial, or policy standards; this should be considered by an individual or group planning to take action based on the contents of this report. The Utah Department of Natural Resources, Utah Geological Survey, makes no warranty, expressed or implied, regarding the suitability of this product for a particular use. The Utah Department of Natural Resources, Utah Geological Survey, shall not be liable under any circumstances for any direct, indirect, special, incidental, or consequential damages with respect to claims by users of this product.

REFERENCE

Biek, R.F., Rowley, P.D., Anderson, J.J., Maldonado, F., Moore, D.W., Eaton, J.G., Hereford, R., and Matyjasik, B., 2012, Interim geologic map of the Panguitch 30' x 60' quadrangle, Garfield, Iron, and Kane Counties, Utah: Utah Geological Survey Open-File Report 599, 124 p., 3 plates, scale 1:62,500.

Final OSL Age Report

Project: **Panguitch STATEMAP**
 Scientist: **Bob Biek, Utah Geological Survey**
 Report by: **Tammy Rittenour**

Report Date: **03 August 2010**
 Project: **085**

Dose Rate Information

USU #	Sample #	Depth (m)	Grain size (µm)	H ₂ O%*	U (ppm)	Th (ppm)	K ₂ O%	Rb ₂ O%	Cosmic (Gy/ka)
USU-693	PL090109-1	0.8	75-150	17.5 ± 5.3	2.9 ± 0.2	18.3 ± 1.7	2.13 ± 0.05	86.8 ± 3.5	0.33 ± 0.03

* In-situ moisture content

Optically Stimulated Luminescence Age Information

USU #	Sample #	Location	Equivalent dose (De), Gy # aliquots* (overdispersion)#	Dose Rate (Gy/ka)	OSL Age (ka)
USU-693	PL090109-1	Panguitch	30 (55) 166.19 ± 64.19 (32.7%)	3.39 ± 0.19	48.95 ± 19.24

* Number of aliquots used for age calculation, number of aliquots measured in parentheses

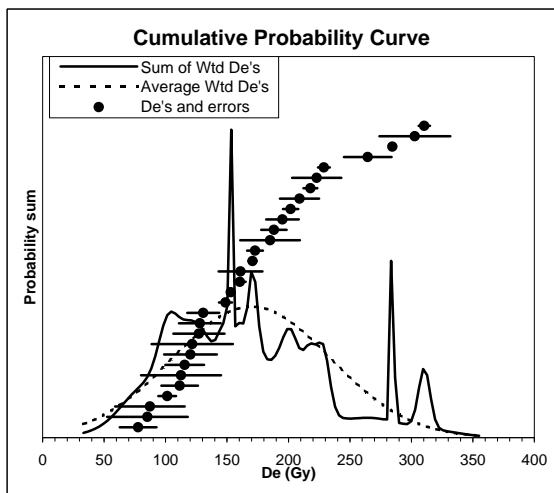
Overdispersion represents error on De beyond instrumental error

Error on De and age is 1 standard deviation

De calculated using the Central Age Model (CAM) of Galbraith et al. 1999

Age analysis using the single-aliquot regenerative-dose (SAR) procedure of Murray and Wintle (2000) on quartz sand using 2-mm aliquots.

Equivalent Dose Distribution: Probability Density Function USU-693



USU Lab procedures for sample processing and age analysis

All samples were opened and processed under dim amber safelight conditions within the lab. Sample processing follows standard procedures involving sieving, gravity separation and acid treatments with HCl and HF to isolate the quartz component of a narrow grain-size range, usually 90-150 μm . The purity of the samples is checked by measurement with infra-red stimulation to detect the presence of feldspar. Sample processing procedures follow those outlined in Aitken (1998) and described in Rittenour et al. (2003, 2005).

The USU Luminescence Lab follows the latest single-aliquot regenerative-dose (SAR) procedures for dating quartz sand (Murray and Wintle, 2000, 2003; Wintle and Murray, 2006). The SAR protocol includes tests for sensitivity correction and brackets the equivalent dose (D_e) the sample received during burial by irradiating the sample at five different doses (below, at, and above the D_e , plus a zero dose and a repeated dose to check for recuperation of the signal and sensitivity correction). The resultant data are fit with a saturating exponential curve from which the D_e is determined. The reported D_e is based on the mean and standard deviation from the measurement of at least 20 aliquots of sand mounted on a 2 mm diameter area of the measurement disks.

Dose-rate measurements were determined by chemical analysis of the U, Th, K and Rb content using ICP-MS and ICP-AES techniques. The contribution of cosmic radiation to the dose rate was calculated using sample depth, elevation, and latitude/longitude following Prescott and Hutton (1994). Dose rates are calculated based on water content, sediment chemistry, and cosmic contribution (Aitken, 1998).

Under the collaborative agreement to analyze samples at the USU Luminescence Lab, it is expected that Dr. Rittenour is included as a co-author on all resultant publications. Please contact me for additional information when you plan your publication.

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