Supplementary Material

1 Supplementary Figures and Tables

1.1 Supplementary Figures

Figure S1. Photo of profile 17-10 at a depth between 140 and 160 cm below the ground surface.

Figure S2. Photo of profile 17-10 at a depth between 200 and 290 cm below the ground surface.

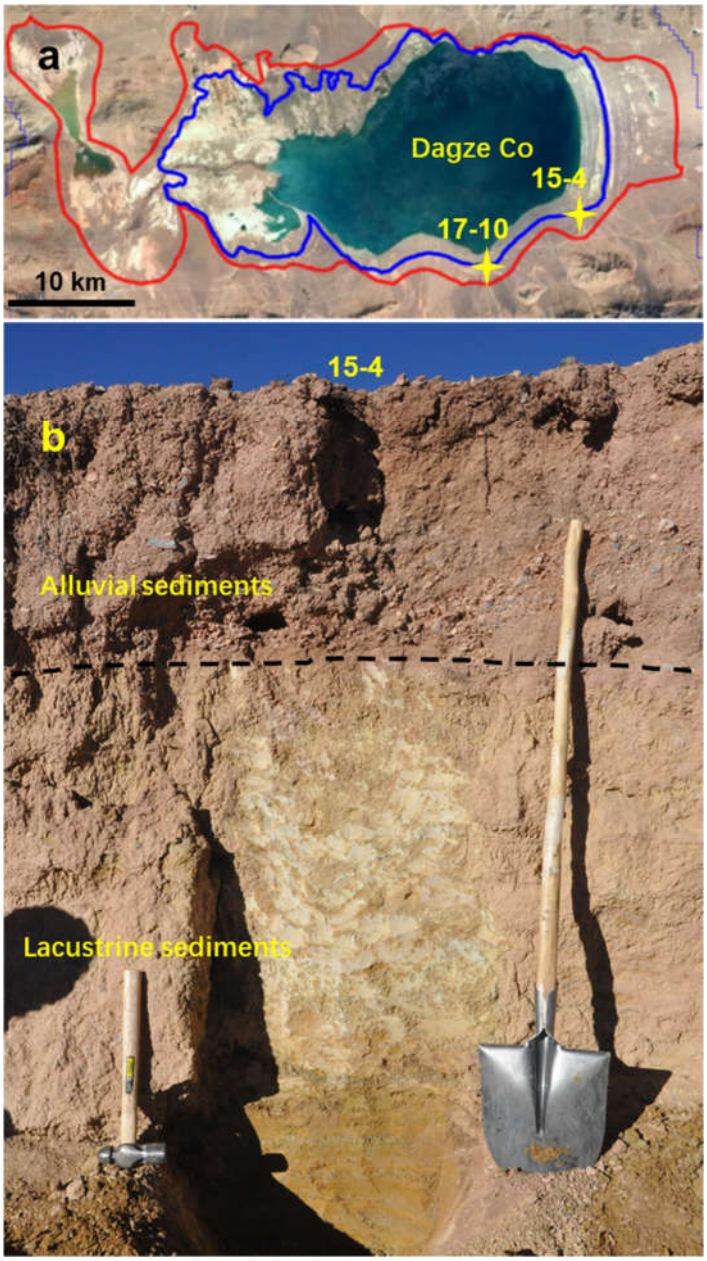

Figure S3. Location of profile 15-4 (a) and photographic image of its sedimentary structure (b).

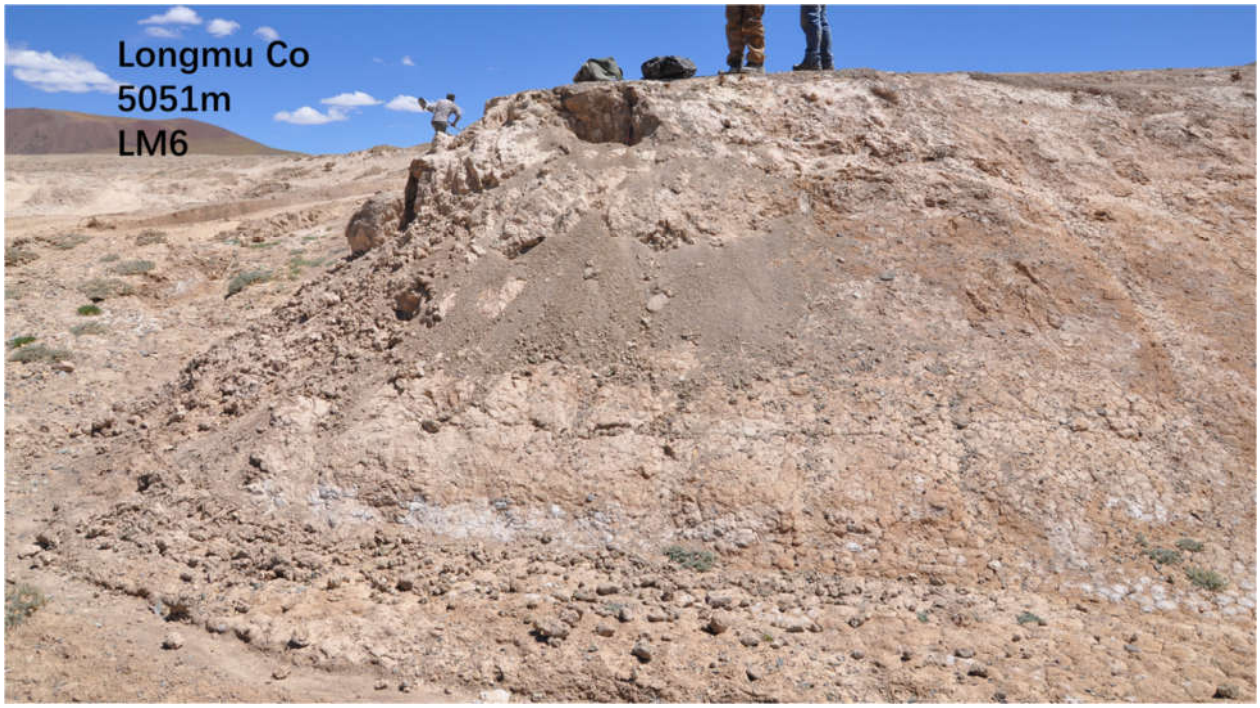

Figure S4. A paleoshoreline composed of lacustrine sands located at the southern margin of Longmu Co that was formed by wave action during a regressive lake phase.

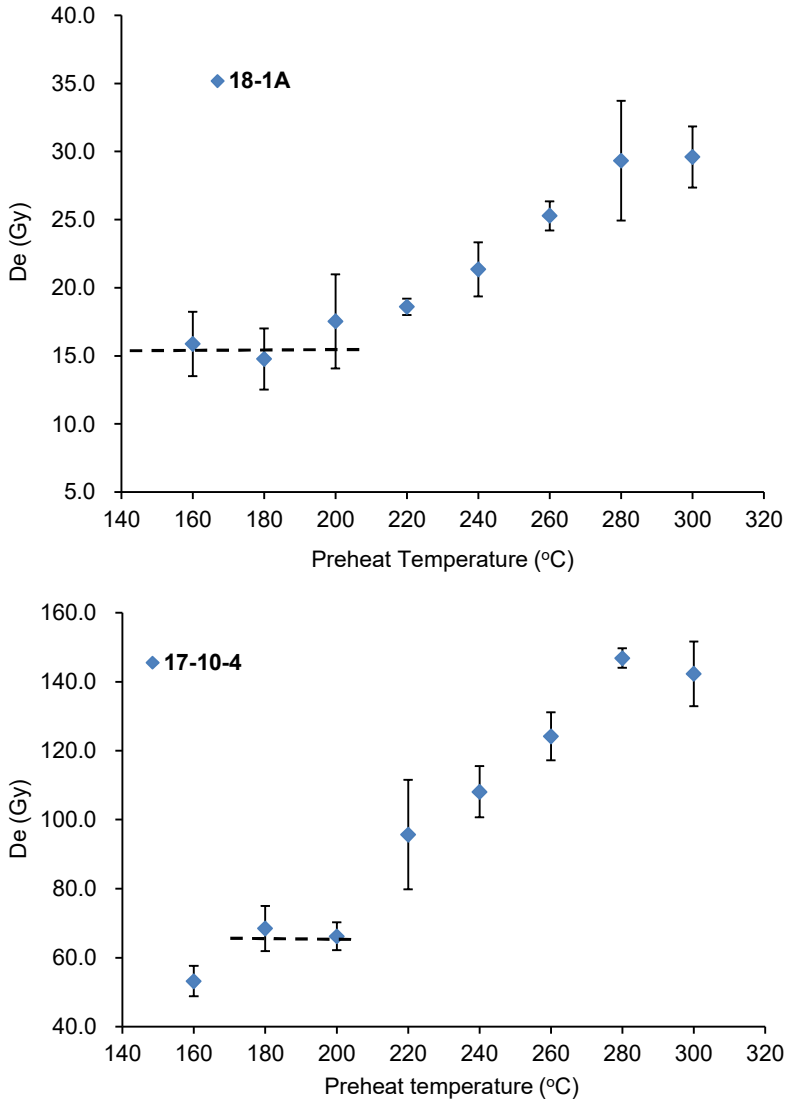

Figure S5. Preheat plateau tests of samples 18-1A and 17-10-4. For samples 18-1A and 17-10-4 a plateau exists from 160-200 °C. Four aliquots were measured at each temperature. Error bars represent one standard error.

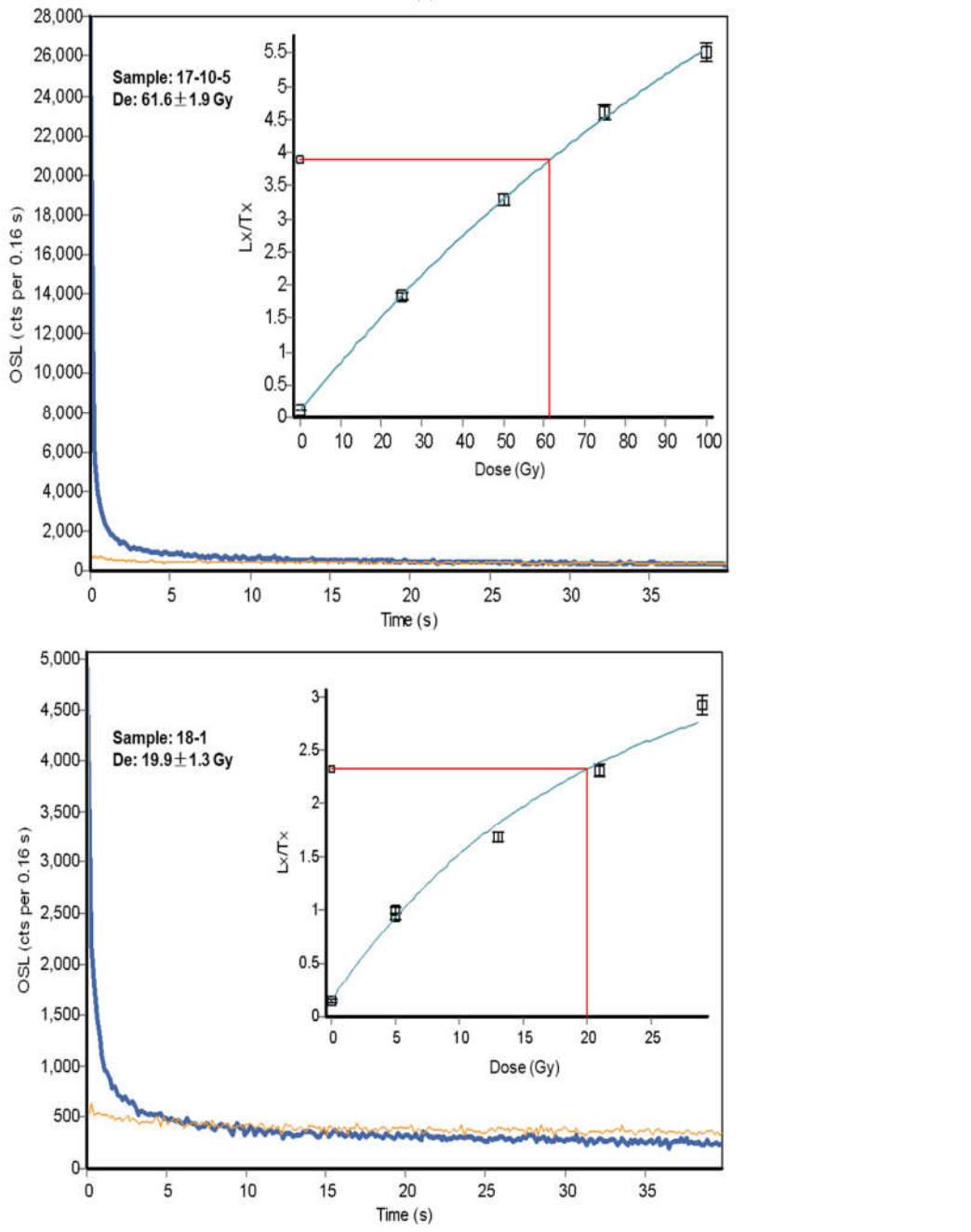

Figure S6. Natural stimulation curves (thick blue line) and zero-dose stimulation curves (fine yellow line) for samples17-10-5 and 18-1A. Insets show the dose-response curves of the samples.

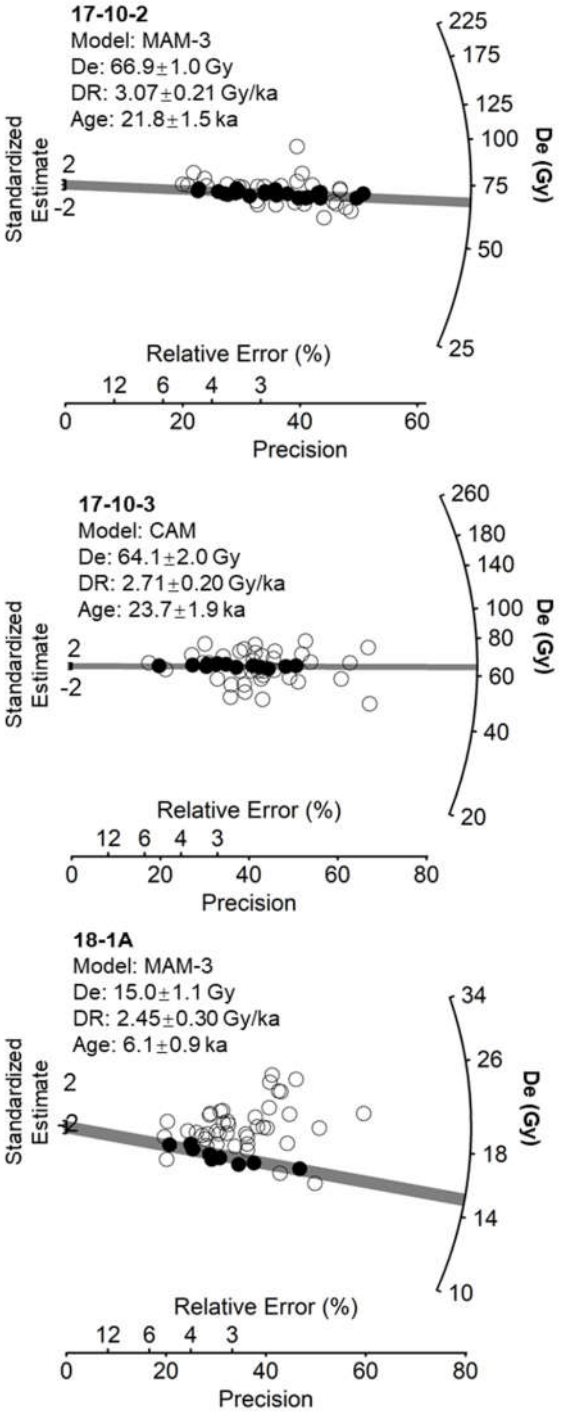

Figure S7. Radial plots showing distributions of equivalent dose (De) and uncertainties of OSL samples from this study. Note that the open circles in the radial plots fall outside the 2-standard deviation estimate ranges and are therefore differentiated from the data points that fall within those ranges. The age model used to calculate the final De, De, dose rate and calculated age are shown at the top-left corner of each plot.

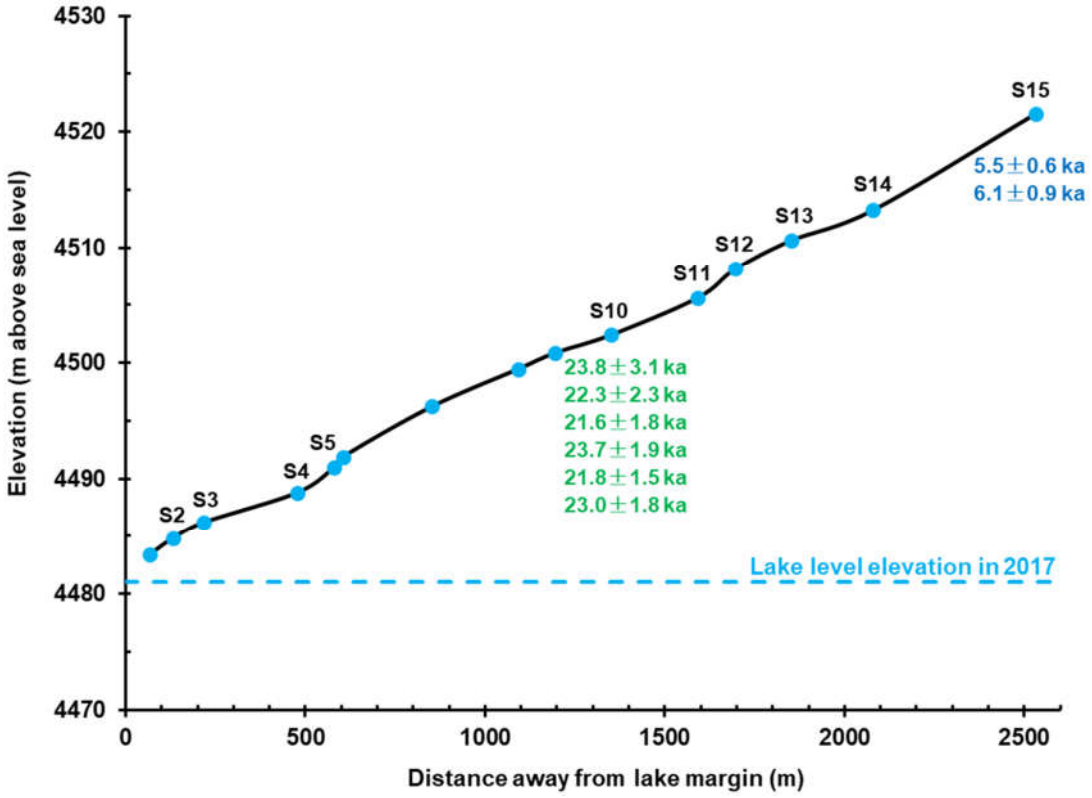

Figure S8. Elevations plotted against the distances from the Dagze Co lake margin (in 2017) for the corresponding paleoshorelines. The associated OSL ages are shown above or below the corresponding paleoshorelines.

1.2 Supplementary Tables

Table S1. Ion content in Dagze Co lake water. Lake water ionic compositions were analyzed at the Test and Analysis Center of the Salt Lake Institute of Qinghai, Chinese Academy of Sciences.

CO_3^{2-} mg/L	HCO_3^- mg/L	Cl^- mg/L	SO_4^{2-} mg/L	Ca^{2+} mg/L	K^+ mg/L	Li^+ mg/L	Na^+ mg/L	Mg^{2+} mg/L
5309	455	1259	4610	1.84	581.5	11.36	6738	85.86

Table S2. Summary of sample codes, radionuclide concentrations, depths, latitudes and longitudes for calculating dose-rates for quartz.

Sample code	K (%)	Th (ppm)	U (ppm)	Depth (m)	Latitude	Longitude
17-10-1	1.630±0.054	8.650±0.268	1.730±0.078	2.55	31.812	87.563
17-10-2	1.770±0.060	10.601±0.297	2.260±0.090	1.95	31.812	87.563
17-10-3	1.701±0.056	9.090±0.273	2.130±0.089	1.60	31.812	87.563
17-10-4	1.610±0.055	8.780±0.263	2.080±0.087	1.30	31.812	87.563
17-10-5	1.690±0.054	8.080±0.250	2.040±0.086	0.90	31.812	87.563
17-10-6	1.710±0.060	10.050±0.290	2.150±0.09	0.60	31.812	87.563
18-1A	1.383±0.380	5.527±0.600	2.264±0.091	0.40	31.803	87.491
18-1B	1.618±0.068	7.122±0.412	2.186±0.078	1.05	31.803	87.491