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Brief communication: New evidence further constraining Tibetan ice core chronologies to the Holocene

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- Figures S1 to S6.
- Tables S1 and S2.

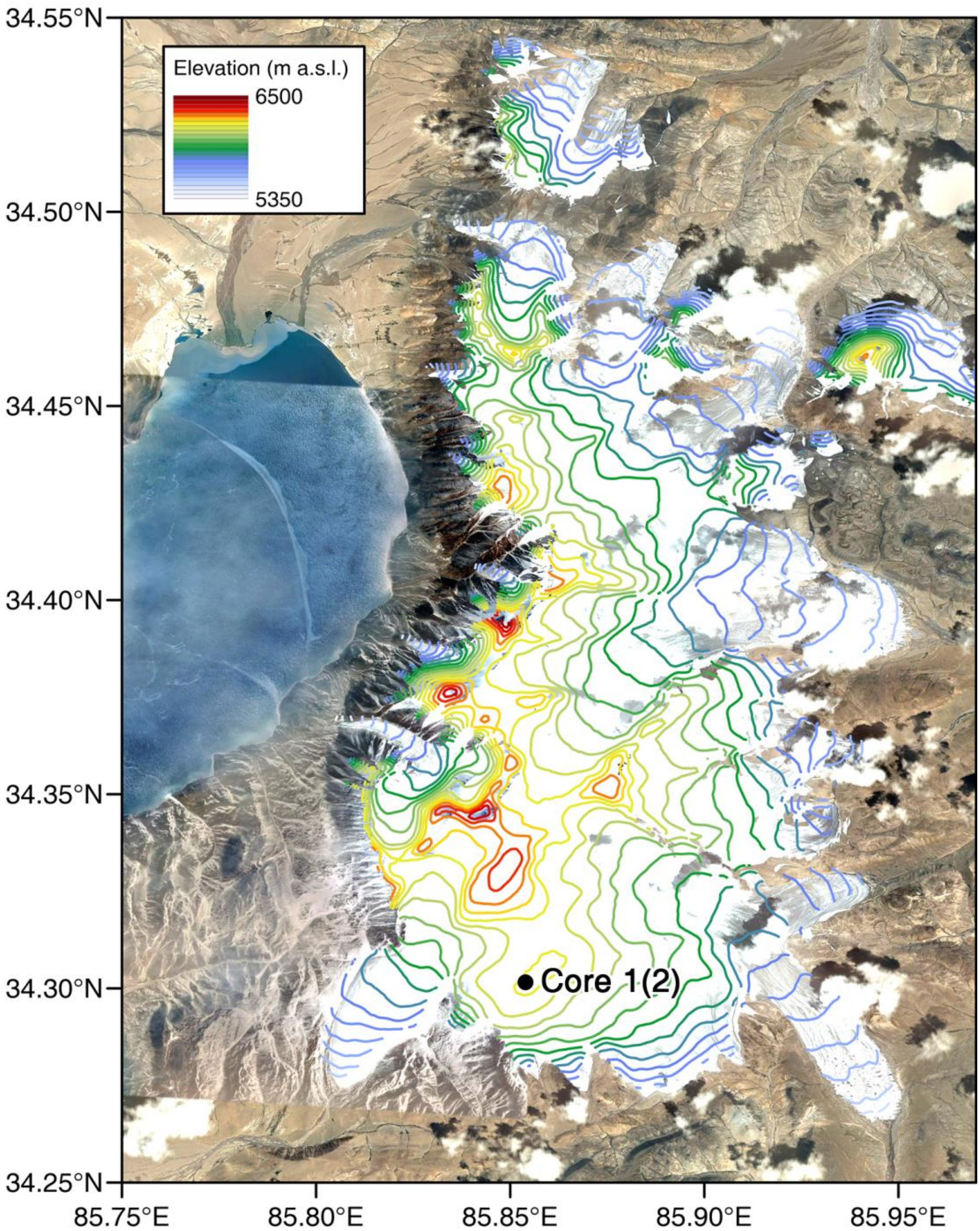

Fig. S1. (a) Satellite image of the ZK glacier with location of the ice-core drilling site (black dot). Elevation contour lines were superimposed on the image of the ice cap. The satellite imagery map is available at: https://www.mapsofworld.com/satellite-maps/world.html. The elevation contour data were extracted using the Shuttle Radar Topography Mission (SRTM) 90m DEM digital elevation database, available at http://srtm.csi.cgiar.org/.

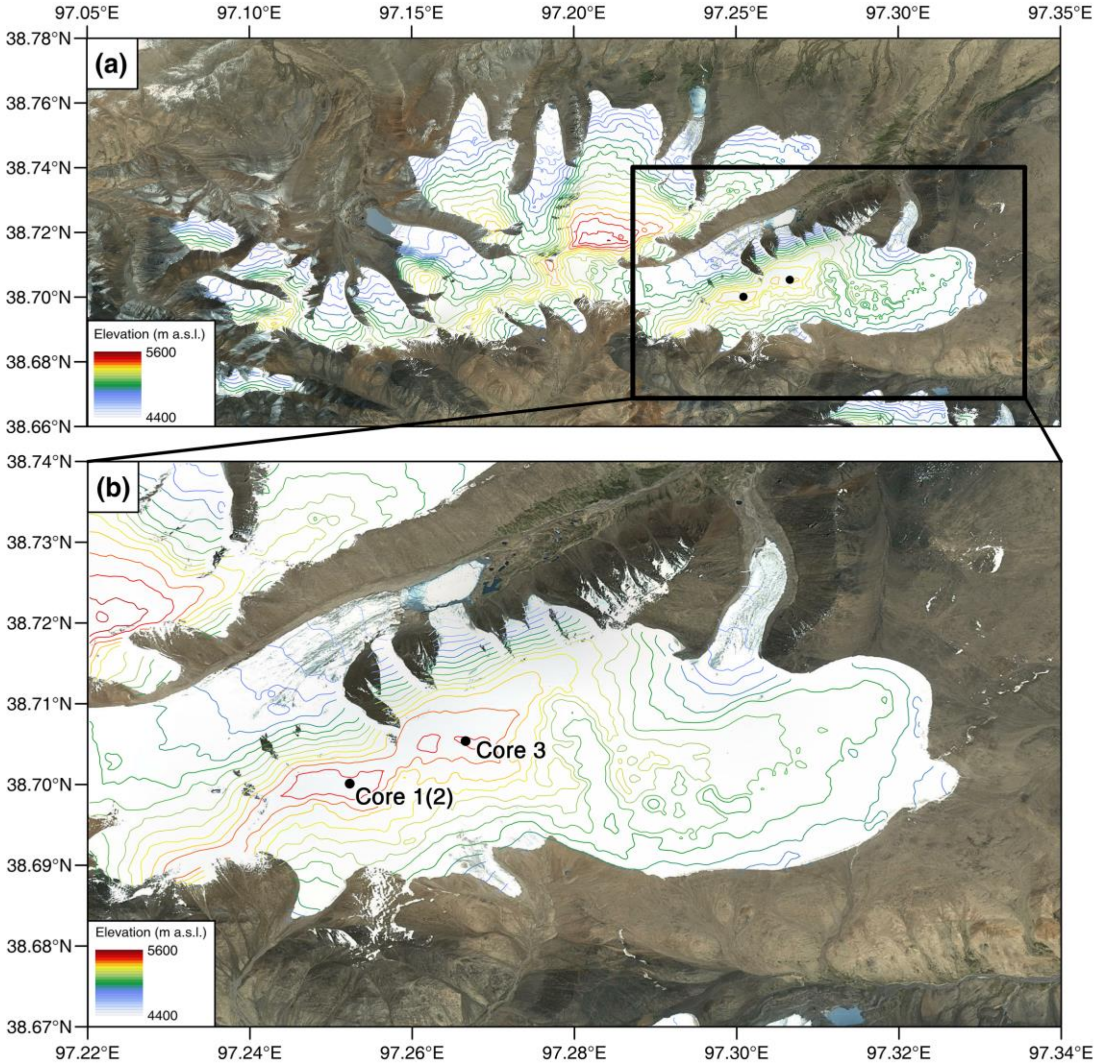

Fig. S2. Satellite image of the SLNS glacier with location of the ice-core drilling sites (black dots). Elevation contour lines were superimposed on the image of the glacier. The satellite imagery map is available at: https://www.mapsofworld.com/satellite-maps/world.html. The elevation contour data were extracted using the Shuttle Radar Topography Mission (SRTM) 90m DEM digital elevation database, available at http://srtm.csi.cgiar.org/.

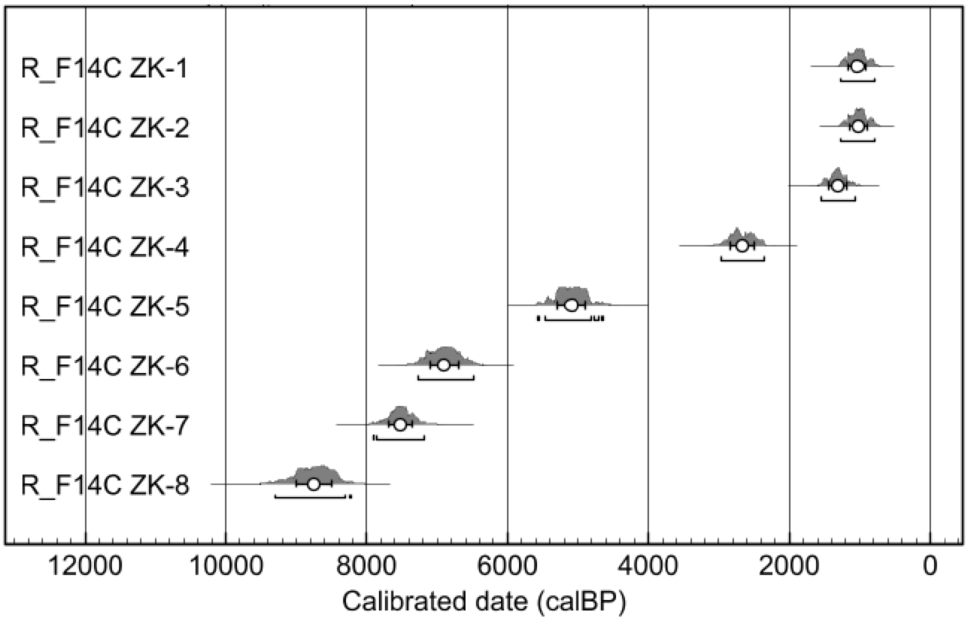

Fig. S3. The ^{14}C cal age probability distributions of the ZK ice core samples, as derived in OxCal v4.3.2 using the IntCal 13 radiocarbon calibration curve (Ramsey and Lee, 2013; Reimer et al., 2013). Probability distributions of calibrated ages are indicated as grey area with the mean age (μ) shown as dot together with the 1σ range. The lines below the probability distribution areas indicate the 2σ range.

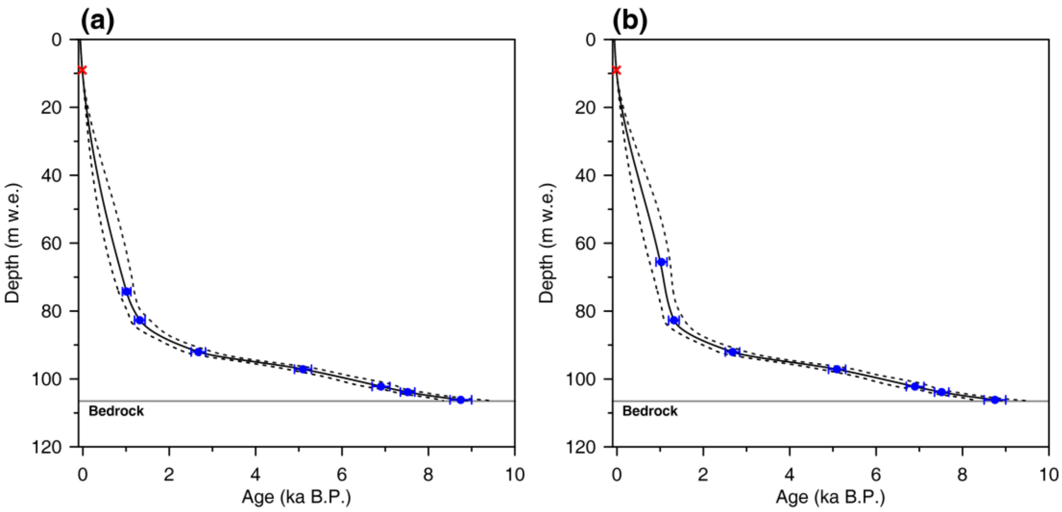

Fig. S4. The alternative age–depth relations of the ZK ice core derived without ZK-1 (a) or ZK-2 (b) based on 2000 Monte Carlo simulations fitting the absolute dated age horizons. For each chart, the solid black line indicates the mean values and dotted lines indicate the 1σ confidence interval. The red cross stands for the reference layer of β-activity peak in 1963 (An et al., 2016). Blue dots show the ages derived with the WIOC ^{14}C results, and the error bars represent the 1σ range. The two models gave the bottom age estimates of $8.90\pm^{0.56}_{0.57}$ ka BP (excluding ZK-1) or $8.91\pm^{0.57}_{0.59}$ ka BP (excluding ZK-2) respectively.

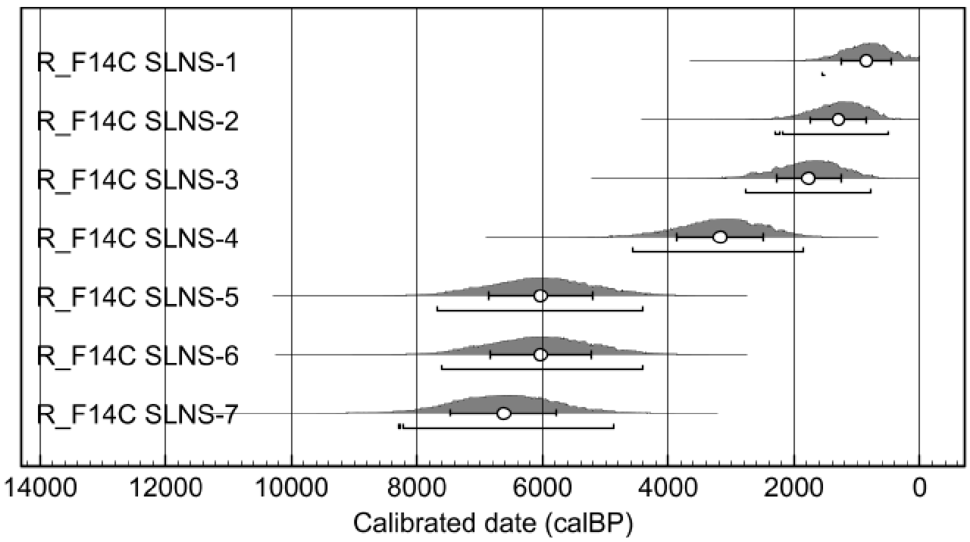

Fig. S5. The ^{14}C cal age probability distributions of the SNLS ice core samples, as derived in OxCal v4.3.2 using the IntCal 13 radiocarbon calibration curve (Ramsey and Lee, 2013; Reimer et al., 2013). Probability distributions of calibrated ages are indicated as grey area with the mean age (μ) shown as dot together with the 1σ range. The lines below the probability distribution area indicates the 2σ range.

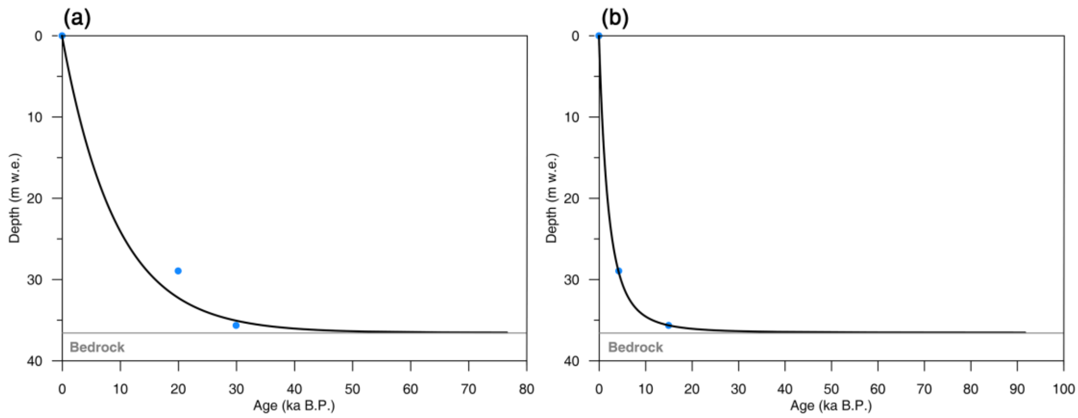

Fig. S6. The depth - age relationship of the 50.86 m Guliya2015 summit ice core based on the two ages at the depths of 41.10 - 41.84 m and 49.51 - 49.90 m from Zhong et al. (2018) (a) and revised ages from Zhong et al., 2020 (b) using a two-parameter (2p) flow model. Confidence interval of the 2p model fit cannot be calculated due to a lack of data. More details about the model can be found in Hou et al. (2019).

Table S1. The ^{14}C ages of the 127.776 m ZK ice core. Absolute uncertainties are given as 1 σ range.

Sample #	Depth (m)	Mass (g)	WIOC (μg)	Bern AMS No.	$F^{14}C$	^{14}C age (ka BP)	Cal age (ka cal BP)	μ ± σ (ka cal BP)
ZK-1	79.96-80.92	940	50	10075.1.1	0.872±0.013	1.100 ± 0.118	0.923-1.178	1.031±0.127
ZK-2	89.98-90.68	588	130	10084.1.1	0.874±0.012	1.079 ± 0.110	0.917-1.174	1.013±0.123
ZK-3	99.89-100.59	566	55	10091.1.1	0.840±0.012	1.398 ± 0.115	1.181-1.475	1.317±0.122
ZK-4	110.77-111.39	590	60	10093.1.1	0.723±0.011	2.610 ± 0.125	2.491-2.854	2.673±0.166
ZK-5	116.58-117.33	852	128	10094.1.1	0.575±0.010	4.446 ± 0.146	4.879-5.286	5.095±0.197
ZK-6	122.57-123.27	614	89	10095.1.1	0.475±0.010	6.033 ± 0.168	6.634-7.154	6.901±0.204
ZK-7	124.54-125.15	548	200	10096.1.1	0.438±0.010	6.637 ± 0.182	7.329-7.674	7.517±0.166
ZK-8	127.18-127.78	558	113	10027.1.1	0.376±0.009	7.863 ± 0.205	8.481-8.983	8.750±0.250

Table S2. The ^{14}C age of the 81.05 m SLNS ice core. Absolute uncertainties are given as 1 σ range.

Sample #	Depth (m)	Mass (g)	WIOC (μg)	Bern AMS No.	$F^{14}C$	^{14}C age (ka BP)	Cal. age (ka cal BP)	μ ± σ (ka cal BP)
SLNS-1	56.79-57.49	420	42	12325.1.1	0.902 ± 0.047	0.829 ± 0.419	0.492-1.262	0.851±0.395
SLNS-2	64.66-65.36	426	45	12324.1.1	0.852 ± 0.046	1.287 ± 0.434	0.766-1.688	1.298±0.449
SLNS-3	68.88-69.69	425	59	12323.1.1	0.807 ± 0.046	1.723 ± 0.458	1.185-2.301	1.775±0.514
SLNS-4	71.84-72.50	483	51	12322.1.1	0.695 ± 0.046	2.923 ± 0.531	2.365-3.708	3.178±0.680
SLNS-5	76.75-77.46	374	51	12321.1.1	0.522 ± 0.046	5.222 ± 0.708	5.071-6.881	6.033±0.829
SLNS-6	78.90-79.63	485	61	12320.1.1	0.522 ± 0.045	5.222 ± 0.692	5.075-6.854	6.032±0.811
SLNS-7	80.30-81.02	413	62	12319.1.1	0.489 ± 0.046	5.747 ± 0.740	5.761-7.424	6.619±0.841