

# Meteorological and Ground observations

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**Monitoring data of the study area and the national weather stations surrounding the study area**

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## Description

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**Meteorological observations** Observation of meteorological factors was conducted at two permanent meteorological stations (Golmud and Wudaoliang) and one field meteorological station (Xidatan) with daily meteorological records. All three meteorological stations contain ground observations.

**Ground observations** The ground temperature and moisture data from the near-surface to within 270 cm in the active layer were recorded. In situ ground observations were deployed starting in July 2013 using thermocouple probes (105T, Campbell Scientific) to measure the soil temperature and using 11 time-domain reflectometer (TDR) probes (model CS615-L, Campbell Scientific) to measure the soil volumetric water content.

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## Keywords

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**Theme:** Permafrost slope; Permafrost engineering; Freeze-thaw; hydrological-thermal-Deformation; Qinghai-Tibet plateau

**Discipline:** cryosphere; In-situ monitoring data

**Places:** Qinghai-Tibet Engineering Corridor; Kunlun Mountain Pass close to Hoh Xil Nature Reserve

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## Data details

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Scale:-

Coordinate Reference System: -

Filesize: ~ 12 M

Data format: CSV, EXCEL XLSX, TXT, dat

## Space scope

North: 35°39' 10"  
West: 90°3' 30" - East: 90°3' 55"  
South: 35°38' 35"



## Files

**Table 1.** Observations period of datasets.

Data Type	Location	Period	File Names
Meteorological observations	Golmud station	1955-2018	Meteo_52818_Golmud_1955-2010.dat;Meteo_52818_Golmud_2010-2018.xlsx
Meteorological observations	Xidatan station	2014-2018	Meteo_00000_Golmud_2014-2019.xlsx
Meteorological observations	Wudaoliang station	1956-2018	Meteo_52908_Wudaoliang_1956-2010.dat;Meteo_52908_Wudaoliang_2010-2018.xlsx
Ground observations	Study Area	2014-2019	GT00000_Slopes_2014-2019.xlsx
Ground observations	Golmud station	1955-2018	GT52818_Golmud.txt
Ground observations	Xidatan station	2014-2018	Meteo_00000_Xidatan_2014-2019.xlsx
Ground observations	Wudaoliang station	1956-2018	GT52908_Wudaoliang.txt

## Variables

**Table 2.** Ground data Metadata of meteorological stations data. The file name with 'GT' is ground observation data.

	ID	Variable	Type	Field Name	Unit	Description
1	1	Station ID	Number(5)	V01000		
2	5	Year	Number(4)	V04001	Year	
3	6	Month	Number(2)	V04002	Month	
4	7	Day	Number(2)	V04003	Day	

	<b>ID</b>	<b>Variable</b>	<b>Type</b>	<b>Field Name</b>	<b>Unit</b>	<b>Description</b>
5	32	Evaporation	Number(6)	V13241	0.1mm	evaporation
6	53	average ground temperature at 0 cm	Number(6)	V12240	0.1°C	GT_0_AVG
7	54	daily maximum ground temperature at 0 cm	Number(6)	V12213	0.1°C	GT_0_MAX
8	56	daily minimum ground temperature at 0 cm	Number(6)	V12214	0.1°C	GT_0_MIN
9	58	average ground temperature at 5 cm	Number(6)	V12240_005	0.1°C	GT_5_AVG
10	59	average ground temperature at 10 cm	Number(6)	V12240_010	0.1°C	GT_10_AVG
11	60	average ground temperature at 15 cm	Number(6)	V12240_015	0.1°C	GT_15_AVG
12	61	average ground temperature at 20 cm	Number(6)	V12240_020	0.1°C	GT_20_AVG
13	62	average ground temperature at 40 cm	Number(6)	V12240_040	0.1°C	GT_40_AVG

	<b>ID</b>	<b>Variable</b>	<b>Type</b>	<b>Field Name</b>	<b>Unit</b>	<b>Description</b>
14	63	average ground temperature at 50 cm	Number(6)	V12240_050	0.1°C	GT_50_AVG
15	64	average ground temperature at 80 cm	Number(6)	V12240_080	0.1°C	GT_80_AVG
16	65	average ground temperature at 160 cm	Number(6)	V12240_160	0.1°C	GT_160_AVG
17	66	average ground temperature at 320 cm	Number(6)	V12240_320	0.1°C	GT_320_AVG

**Table 3.** Meteorological Metadata of meteorological stations data. The file name with 'Meteo' is Meteorological observation data.

	<b>ID</b>	<b>Variable</b>	<b>Type</b>	<b>Unit</b>	<b>Description</b>
1	1	Station ID	Number(5)		
2	5	Year	Number(4)	Year	Year
3	6	Month	Number(2)	Month	Mon
4	7	Day	Number(2)	Day	Day
5	32	daily mean air temperature at 2 m	Number(6)	0.1°C	Temperate
6	53	maximum air temperature at 2 m	Number(6)	0.1°C	Tmax
7	54	minimum air temperature at 2 m	Number(6)	0.1°C	Tmin
8	56	average wind speed	Number(6)	0.1°C	Wind
9	58	average precipitation	Number(6)	0.1mm	Precip

	ID	Variable	Type	Unit	Description
10	59	Corrected average precipitation	Number(6)	0.1°C	Corrected_P
11	60	Evaporation	Number(6)	0.1mm	Evaporation
12	61	Air humidity	Number(6)	%	Humidity
13	62	Air pressure	Number(6)	0.1Pa	Press
14	63	sunshine time	Number(6)	0.1h	Sunshine
15	64	average ground temperature at 0 cm	Number(6)	0.1°C	GT

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## Article DOI

- <https://doi.org/10.5194/essd-2020-106>
- This article contains all the data DOI.

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## Abbreviation

- **TDR:** Time-domain Reflectometer
- **TLS:** Terrestrial Laser Scanning
- **UAV:** Unmanned Aerial Vehicle
- **RGB:** Red-Green-Blue
- **TIR:** Thermal Infrared

- **InSAR:** Interferometric Synthetic Aperture Radar
  - **MAAT:** Mean Annual Air Temperature
  - **MAGST:** Mean Annual Ground Surface Temperature
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## Data resource provider

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## Data Sources and Terms of Use

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The use of data is conditional on citing the original data sources. Full details on how to cite the data are given at the top of each page. For research projects, if the data are essential to the work, or if an important result or conclusion depends on the data, co-authorship may need to be considered. Permafrost engineering and slope monitoring facilitate the acquisition of data to encourage its use and promote understanding of the potential impact of freeze-thaw cycles on Permafrost engineering. Respecting original data sources is key to help secure the support of data providers to enhance, maintain and update valuable data.

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## License

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