

Freezing Level Height

1. Products

Monthly mean Freezing Level Height (FLH) and anomalies relative to the 1991–2020. The FLH refers to the height of the atmosphere in the troposphere where the mean air temperature is 0°C. It has an indicative significance for the phase transition of atmospheric moisture and is an important indicator for monitoring climate change in the third pole region.

2. Products specifications

Areal coverage: TPRCC-Network service domain (25°–50°N, 65°–105°E)

Spatial resolution: 0.25° × 0.25°

Temporal resolution: Monthly

Projection: Regular latitude-longitude projection

Availability: Jan. 2021 to present

Timeliness: Within one week after the end of each month

Units: gpm (geopotential metre)

Format: PNG

3. Data sources

Monthly air temperature and geopotential height from CRA40 from 1979 onwards.

4. Methodology

4.1 Monthly FLH

Monthly FLH for each grid cell is calculated by linear interpolation of monthly mean air temperature and geopotential height from surface to 300hPa. Calculations are performed only where the monthly mean surface air temperature exceeds 0°C; grid cells with temperatures ≤ 0°C are masked in gray in products.

4.2 Monthly Anomalies

FLH anomalies are computed as the departures of the FLH from the corresponding 1991–2020 averages. Only grid cells with a monthly data availability of no less than 80% during 1991–2020 are used to compute FLH anomalies; all others are masked in gray in products.

5. References

Wang, S., M. Zhang, N. C. Pepin, et al., 2014: Recent changes in freezing level heights in High Asia and their impact on glacier changes, *Journal of Geophysical Research: Atmospheres*, 119, 1753–1765. <https://doi.org/10.1002/2013JD020490>.

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