WORLD METEOROLOGICAL ORGANIZATION

# Third Pole Regional Climate Center-Network (TPRCC-Network)

WMO RCCs are centres of excellence that develop and coordinate regional products and services including climate data, monitoring and prediction that support regional and national climate activities, and thereby strengthen the capacity of WMO Members in each region to deliver better climate services to national and local-level users and partners.

A group of centres performing climate-related activities that collectively fulfil all the required mandatory functions of an RCC may be designated as a WMO Regional Climate Centre Network. Each centre in the WMO RCC Network will be referred to as a Node.

***The Northern Node:*** (Climate Monitoring Function)

*Lead:* National Climate Center, China Meteorological Administration, China (NCC/CMA)
Consortia members: Bhutan, Mongolia, Nepal, Pakistan

***The Southern Node:*** (Operational Data Services Function)

*Lead:* India Meteorological Department (IMD), India
Consortia members: Bangladesh, Bhutan, Myanmar, Nepal

***The Western Node:*** (Long-range Forecast Function)
*Lead:* Pakistan Meteorological Department (PMD), Pakistan
Consortia members: Afghanistan, China, Tajikistan, Uzbekistan

The following global and regional partners are technical contributors to the Network:

***The Global Cryosphere Watch*** *(GCW) program*
***Third Pole Environment*** *(TPE) program*

***International Centre for Integrated Mountain Development*** *(ICIMOD)*

***The Global Energy and Water Exchanges*** *(GEWEX) project*
***Mountain Research Initiative*** *(MRI)*

The implementation of Training function is shared among all nodes.
China provides an overall coordination, including the establishment and maintenance of the TPRCC-Network web portal.
China Meteorological Administration:

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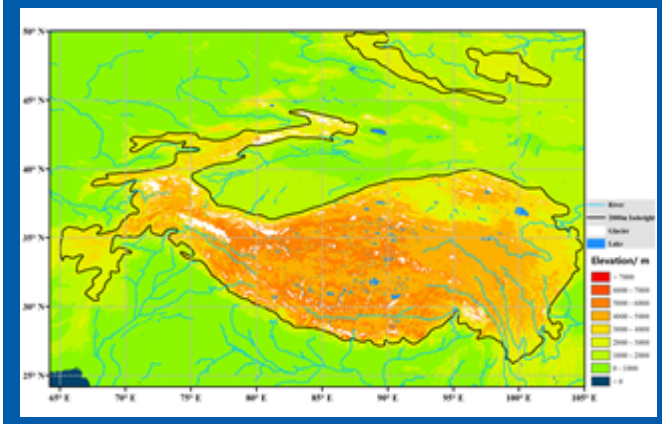
## OVERVIEW

The domain of the TPRCC-Network covers a rectangular area bounded by 25°N-50°N Latitude, 65°E-105°E Longitude, with a 2000 m contour line within this area highlighting the concept of high mountain, which is the mean altitude that the main rivers in the third pole region flow out of mountain passes. The services delivered by the TPRCC-Network will benefit countries whose territories overlap the identified domain.



The TPRCC-Network coordinates the Third Pole Climate Forum (TPCF) which is to be organized twice a year – in May and November – starting in June 2024. Demonstration phase of TPRCC-Network at technical level was initiated in May 2022 and was launched formally in June 2024 with the inaugural Third Pole Climate Forum (TPCF) in Lijiang, China.

TPRCC-Network maintains a close collaboration with the RCCs and RCC Networks that geographically intersect with TPRCC domain, such as RCC-Beijing, RCC-Pune, as well as those with similar interests, such as the Arctic Regional Climate Center-Network.

Website links of TPRCC-Network and each node are listed below:

▪ TPRCC-Network web portal as the interface with users: http://www.rccra2.org/tp-rcc/. It also provides access to the websites of the Nodes.

▪ TPRCC-Northern Node: http://bcc.ncc-cma.net/tprcc-network/

▪ TPRCC-Southern Node: http://www.imd.gov.in/

▪ TPRCC-Western Node: https://ffd.pmd.gov.pk/cp/tprcc-network/tprccn-new.html

Language of the TPRCC services and products is English.

### *Regional climate features*

The climate over the Third Pole region is characterized by:

▪ Diversified climate types from south to north, with low mean air temperatures and high seasonal temperature variations, in high-altitude areas

▪ Higher warming rate than the global average, high solar radiation levels

▪ Extensive but fragile cryosphere, e.g., accelerated glacier and permafrost melting

▪ Increasing abundance of glacial lakes

▪ Frequency of Glacier Lake Outburst Floods (GLOFs) peaked in the 1970s and did not increase afterwards. However, the threat of GLOF remains high and increase in their frequency cannot be excluded later in the 21st century

▪ Increased vulnerability to climate change

▪ Higher rate of elevation dependent warming and erratic rainfall

Climate change-induced glacier retreat, changes in runoff, precipitation pattern are key factors influencing the regional and sub-regional climate.

### *Mandatory functions*

Long-range forecasting

- key LRF products and their operational schedules
- the methodology and the tools used for producing seasonal predictions
- the methodology of assessment of forecast skills and performance for the region

### *Climate monitoring*

▪ Seasonal and annual climate bulletins in the TPRCC region

▪ Thematic monitoring products on cryosphere (seasonal snow cover, glacier area and mass balance, permafrost, etc.) and related hazards and high-impact event, in the process of developing.

▪ Climate advisories and information for multi-users, if needed

#### *Operational data services*

- data sets (format, time, and space resolution)
- gridded and station historical reference climatology (time and space resolution)

#### *Training and capacity-building*

- Training of NMHSs users on cryosphere observations and monitoring capacity
- Assisting NMHSs in the training of users on the application and implications of LRF products
- Assisting in professional capacity building of climate experts for generating user-targeted products

More functions to be implemented with the development of TPRCC-Network.

### *Success story*

Detailed inventories of existing and projections of future glacial lakes which may form following glacier retreat have been developed for the northern Tien Shan, Kazakstan. Changes in areas of over 800 lakes were measured over time in the Ile-Kungey and Jetisu Alatau and bathymetries of over 50 lakes have been obtained by the Central Asia Regional Glaciological Centre under the Auspices of UNESCO (Kazakhstan) and the University of Reading (UK). Future projections of the potential lake formation were derived using Glacier Bed Topography Version 2 (GlapTop2) model. The model had successfully simulated 70% of lakes which formed at the predicted locations between 2000 and 2014. The projected lake bathymetries were realistic. Both observational and modelled data have been delivered to the Kazakhstan State Mudflow Protection Agency which actively uses this information in both monitoring and lake management activities. In particular, the Agency instigated in situ investigations and continuous monitoring of those lakes whose areas are projected to grow. This work can be expanded to other areas in the TPRCC region improving resilience and adaptive capacity of the local populations.