Introduction of Third Pole Environment (TPE) Programme

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The Third Pole region covers 5 million km$^2$ in area with an elevation higher than 4000m by average.
The Third Pole Provides Water Resources and Ecosystem Services for About 2 Billion People
Third Pole Environment Program

Chair, Tandong Yao
Co-Chairs: Lonnie G. Thompson (U.S.), Volker Mosbrugge (Germany)
Climate warming | Asian monsoon | Human activity

Glacier & Snow (permafrost)

River Runoff | Lake area/number | Soil moisture | Flood/drought

Agriculture Industry | Ecosystem biodiversity | Natural/human disasters

Water & Land management | Disaster risk reduction | community adaptation
The Objectives of TPE

✓ To obtain a system understanding of the evolution of third pole and of its impact on the dynamics of the earth system: past - present - future.
✓ To understand the mechanism of Ice-Water-Atmosphere-Ecosystem-Human interaction in Third Pole region to support the sustainable development of the region.

TPE Research Priorities

✓ The key earth system processes and their interactions among multi-spheres in Third Pole region
✓ The impacts of global change to Third Pole environment, livelihood and society.
✓ Scientific assessments and adaptation advices to government/policy makers to support the sustainable development of the society
1. GHP and projects progress report
2. Atmospheric circulation in high-latitude and the Third Pole region
3. Remote sensing and data retrieval for cryosphere
4. Land-surface interaction water resource/cycle in high-latitude and the Third Pole region
5. Climate modelling and future projection for Third Pole
6. Natural hazards and human adaptation in Third Pole
1. Regional/global modeling focusing on Third Pole, especially providing high resolution model products for the region

2. Water-energy exchanges and transport over the Third Pole region

3. Hydrological cycle over the Third Pole region
Session Introduction
The Third Pole Region is facing severe sustainability challenges to water scarcity, land degradation and natural disasters in recent decades. Warming acceleration after the 1990s in this region has resulted in crucial changes in glacier, snow cover, permafrost, lakes, rivers, wetlands and pastures that affect the livelihoods of millions of people through local and regional, to global scales.
In 2016, a TPE workshop in Xining has presented the latest scientific achievements on observations, analysis and modeling related to land-atmosphere Interactions and the water cycle in Third Pole Region.
Recent Third Pole's rapid warming accompanies cryospheric melt and water cycle intensification and interactions between monsoon and environment: multi-disciplinary approach with observation, modeling and analysis

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This session further presented the latest scientific achievements with focus on

1). Glacier, snow dynamics and local/regional hydrological cycle in the Third Pole Region

2) Land surface characteristics, parameterizations and its application in regional climate modeling over the highlands of the Third Pole
This session further presented the latest scientific achievements with focus on

3) Global and Regional Earth system (multi-sphere) modeling for the Third Pole Region and TPE processes impact on the adjacent regions at different scales

4) Ground/satellite observations and data assimilation for the highlands of the Third Pole Region.