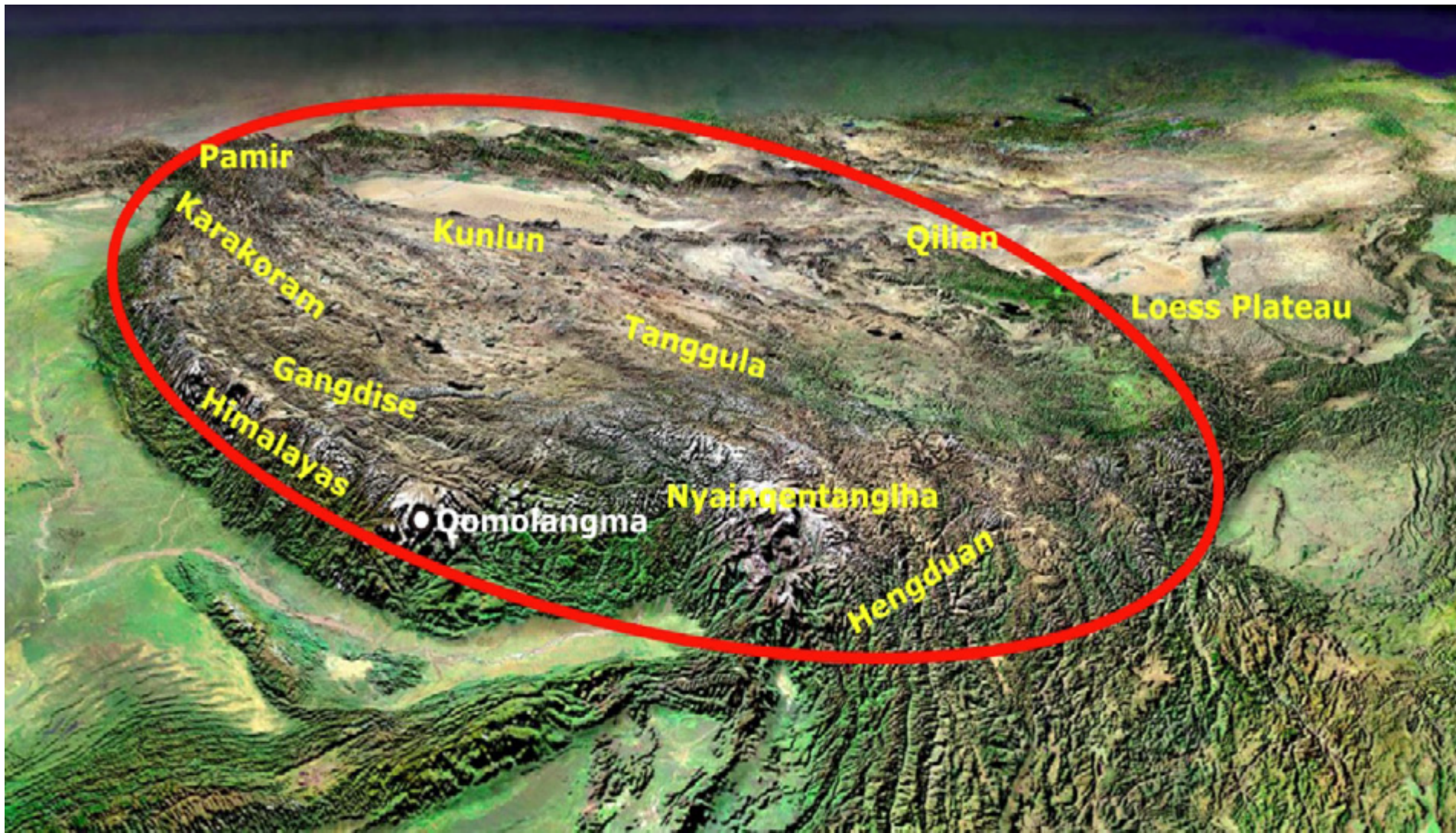


Introduction of Third Pole Environment (TPE) Programme

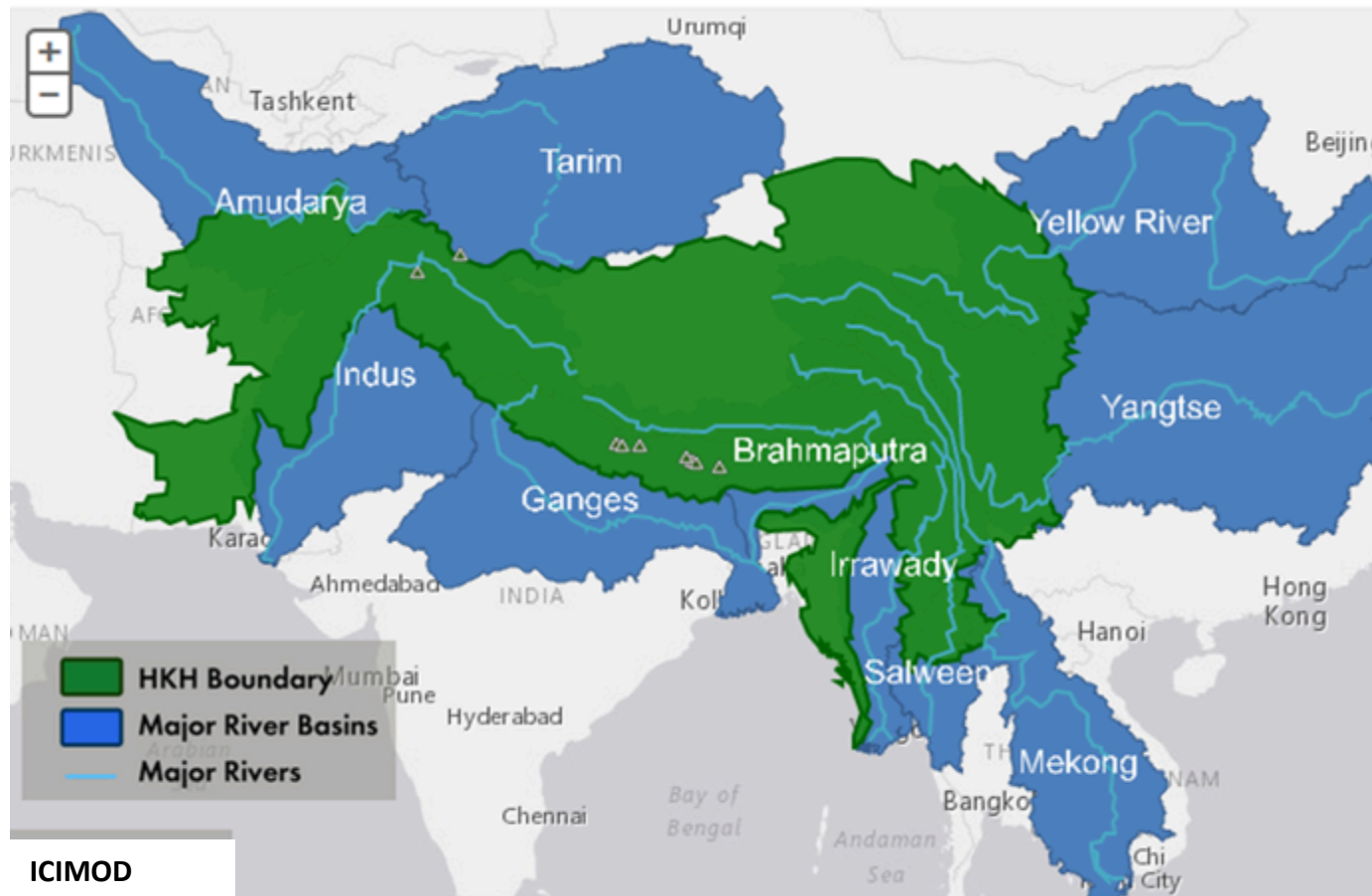


Ailikun, Yongkang Xue

The Third Pole region covers 5 million km² 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

GHP-TPE joint workshop

17-19 Oct 2017, Kathmandu

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

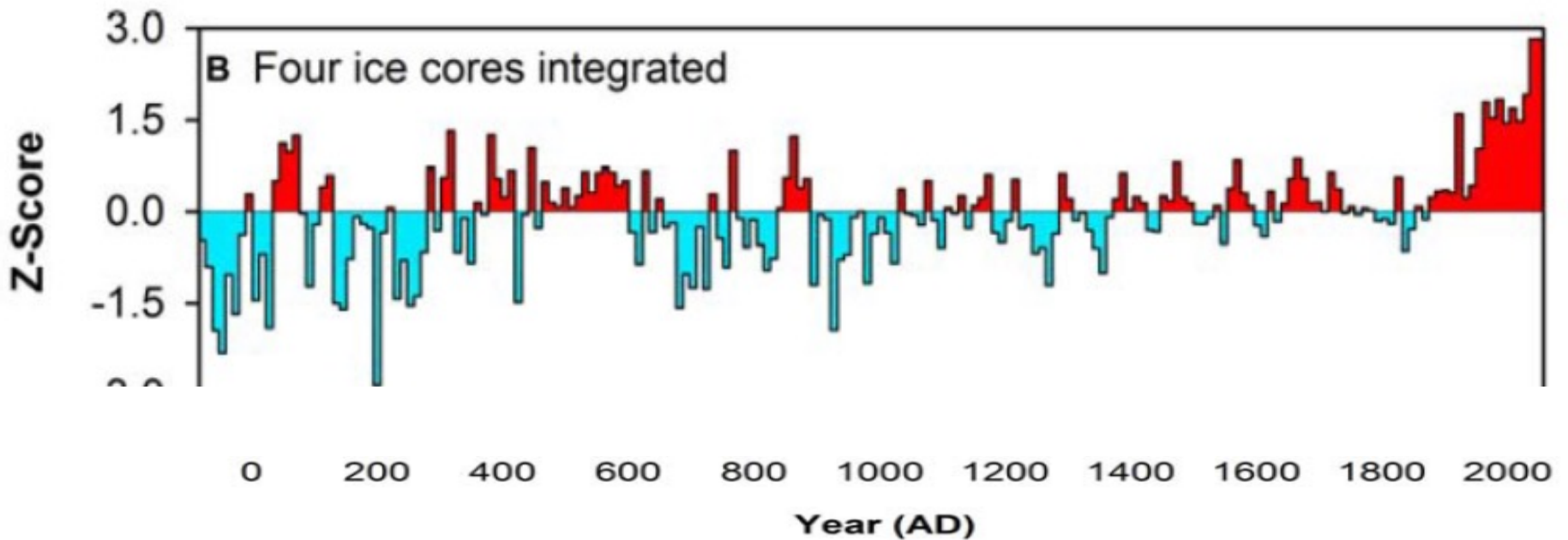


New GHP Crosscutting Project: Third Pole Environment (TPE) Water-Sustainability

- 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.



Advancing a Multisphere Approach to Third Pole Research - Eos

<https://eos.org/meeting-reports/advancing-a-multisphere-app>

Meeting/Workshop Reports

Workshop on Land Surface Multi-Sphere Processes of the Tibetan Plateau and Assessment of Their Environmental and Climate Effects

**8–10 August 2016
Xining, China**

Tandong Yao¹ and Yongkang Xue²
¹Institute of Tibetan Plateau Research, Chinese Academ of Sciences, China; ²University of California, Los Angeles

Advancing a Multisphere Approach to Third Pole Research AGU/EOS

The International Workshop on Land Surface Multi-spheres Processes of Tibetan Plateau; Xining, Qinghai Province, China, 8–10 August 2016

International Workshop on Land Surface Multi-spheres Processes of Tibetan Plateau
Xining, Qinghai, China 2016.8.8-2016.8.10



The International Workshop on Land Surface Multisphere Processes of Tibetan Plateau

1 **Recent Third Pole's rapid warming accompanies cryospheric melt and water**
2 **cycle intensification and interactions between monsoon and environment:**
3 **multi-disciplinary approach with observation, modeling and analysis**

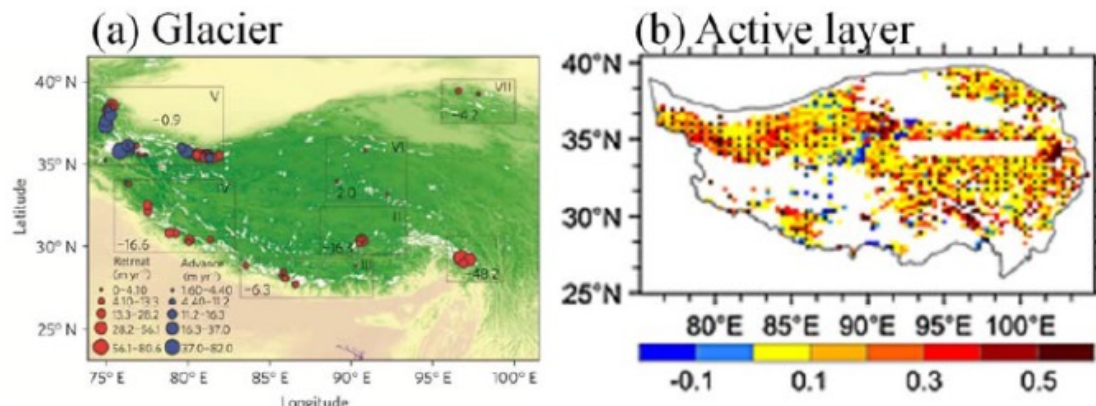
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5 Tandong Yao¹, Yongkang Xue²⁺, Deliang Chen³, Fahu Chen¹, Peng Cui⁴, Toshio Koike⁵, William
6 K.-M. Lau⁶, Dennis Lettenmaier², Lonnie Thompson⁷, Volker Mosbrugger⁸, , Renhe Zhang⁹,
7 Baiqing Xu¹, Jeff Dozier¹⁰, Thomas Gillespie², Yu Gu², Shichang Kang¹¹, Shilong Piao¹², Shiori
8 Sugimoto¹³, Kenichi Ueno¹⁴, Lei Wang¹, Fan Zhang¹, Yongwei Sheng², Weidong Guo¹⁵, Weicai
9 Wang¹, Ailikun¹, Xiaoxin Yang¹, Yaoming Ma¹, Samuel S.P. Shen Shen¹⁶, Zhongbo Su¹⁷, Fei
10 Chen¹⁸, Shunlin Liang¹⁹, Yimin Liu²⁰, Vijay P. Singh²¹, Kun Yang¹, Daqing Yang²², Xinquan
11 Zhao²³, Yu Zhang¹⁰

BAMS

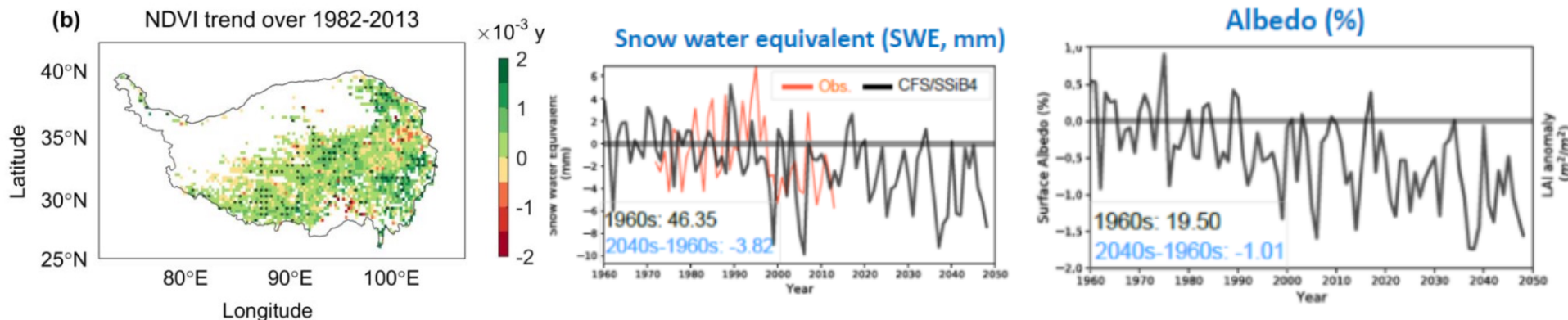
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13
14 1. Institute of Tibetan Plateau Research, Chinese Academy of Sciences, Beijing 100101, P.R.
15 China
16 2. University of California, Los Angeles, Los Angeles, CA 90095, USA
17 3. Department of Earth Sciences, University of Gothenburg, Gothenburg, Sweden
18 4. Institute of Mountain Hazards and Environment, Chinese Academy of Sciences,
19 Chengdu, 610041, P.R. China
20 5. International Centre for Water Hazard and Risk Management, Tsukuba, 305-8516, Japan
21 6. CMNS-Earth System Science Interdisciplinary Center, College Park, MD 20740- USA
22 7. Byrd Polar and Climate Research Center and the School of Earth Sciences, The Ohio State
23 University, Columbus 43210, USA
24 8. Senckenberg Research Center for Nature, Frankfurt, 60325, Germany
25 9. Institute of Atmospheric Sciences, Fudan University, Shanghai 200433, China

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

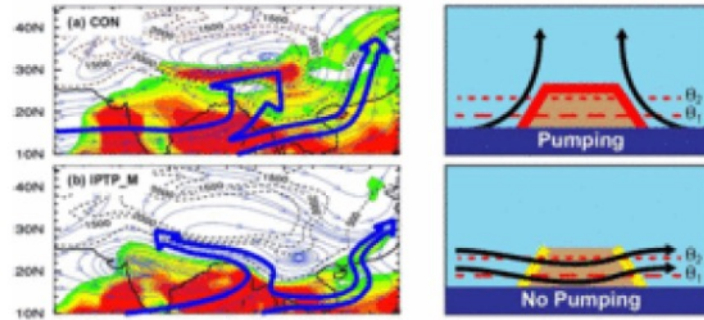


2) Land surface characteristics, parameterizations and its application in regional climate modeling over the highlands of the Third Pole



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

