

Workshop on environmental change, glacial and hydrological processes,
and related consequences in the Third Pole region

Beijing & Lhasa, China,

August 15 -20, 2009

The planned workshop on environmental change, glacial and hydrological processes in the Third Pole region will be held in Beijing and Lhasa, China, during August 15-20, 2009.

In addition to focusing on the Arctic and Antarctic regions, the international scientific community also focuses on the Third Pole region, which extends from the Karakorum, the Pamir Plateau and Hindu-Kush in the west to the Hengduan Mountains in the east, and from the Kunlun Mountains and Qilian Mountains in the north to the Himalaya Mountains in the south, with the Tibetan Plateau in the middle. The Third Pole region covers an area more than 5 million km² with an average elevation of over 4000 m. Bordered by more than 10 countries and bearing direct impacts on a population of more than 10 billion, this region is important not only in terms of academic research, but also in terms of economic development and social security.

The Third Pole region, with its huge geographic presence and high topography, impacts the atmospheric circulation patterns of not only the Eurasia, but also the entire northern hemisphere, and even the globe at large. The environment in the Third Pole region is currently characterized by unique changes in the cryosphere, atmosphere, hydrosphere, and biosphere, which would seriously impact the social and economic sustainability in the region.

Glacial and hydrological processes, the two most significant processes in the Third Pole, are sensitive indicators of environmental changes. Recent studies found that glaciers in the Third Pole region are undergoing accelerated retreat, though the extent of glacial retreat differs by locations. Dominated by continental climate, the region's central part exhibits the smallest extent of glacial retreat, while the south-eastern part influenced by the maritime climate exhibits comparatively greater retreat. Glacial mass balance is thus crucial to understand the glacial retreat in the Third Pole region. The more negative glacial mass balance indicates rapid ice loss and increased glacial-melt input into hydrological processes. Scientists have projected a 43% decrease in glacial area on average by the year 2070, and a 75% decrease by the end of the 21st century at the current

warming rate. If that happens, it will have a far-reaching effect on the hydrological processes in the Third Pole region. Moreover, more and more scientists come to recognize the impact of the black carbon on glacial melting, and consider it an important issue in the prediction of how the rapid economic development and associated more black carbon input accelerate glacial melting.

With glacial melting and glacier retreat, inhabitants in the Third Pole region are confronted with imminent threats by two most significant hydrological processes: the glacial lake expansion Flood (GLEF) and glacial lake outburst Flood (GLOF). In general, lakes mainly fed by glacial melting expand; whilst those mainly fed by precipitation shrink. Some scientists attributed variations in glaciers and lakes to the rising temperature, while others attributed them to increasing precipitation and weakening evaporation.

As glacial fluctuation and lake variation are important components of the environmental changes in the Third Pole region, it is both important and urgent to reach a more accurate and consistent understanding of the causes behind the change from a broader perspective. Current study of environmental changes in the Third Pole region involves two focuses, that of existing-processes observation and of paleo-environment archiving. In existing-processes observation, monitoring of water cycles, especially that related to glacial mass balance and lakes variations, is the core of the study. In paleo-environment reconstruction, such proxies as ice core, lake sediment and tree ring records are essential, as they provide the golden key to paleo-environmental reconstruction.

Scientists become more and more aware of the importance of environmental change, glacial and hydrological processes in the Third Pole region. A workshop is thus called upon, to gather distinguished scientists bearing intense interest in the study of environmental change, glacial and hydrological processes in the Third Pole region, offering them a platform to exchange views on the research progress and farsightedness to advance relevant academic plans.

The workshop will be focusing on the following four topics:

Topic 1 Environmental changes since 2000 years ago

Topic 2 Water cycles and the Indian monsoon

Topic 3 Glacial retreat and glacial mass balance

Topic 4 Lakes affected by glaciers and related potential hazards