International GEWEX/GASS/LS4P and TPEMIP
Regional Modeling & Aerosol in Snow Workshop

July 7-9, 2019

International Conference Center, Nanjing University, Nanjing, China

Organized and Sponsored by:
GEWEX/Global Atmospheric System Study (GASS)
Third Pole Environment (TPE)
University of California at Los Angeles (UCLA)
Nanjing University

Workshop Co-Chairs:
Yongkang Xue (UCLA), Tandong Yao (TPE), William K-M Lau (UMD), Aaron Boone (Meteo-France)

Since the launch of the GEWEX/GASS/"Impact of initialized land temperature and snowpack on sub-seasonal to seasonal prediction" (LS4P) Initiative and "Third Pole Experiment Multi-Model Intercomparison" (TPEMIP) Project in 2018, more evidence and research have supported the concept that the high elevation land surface temperature/subsurface temperature (LST/SUBT) in the Third Pole region (TP) has substantial remote predictive capability on precipitation on subseasonal to seasonal scales (S2S). Following a recommendation from the productive LS4P workshop at the 2018 AGU Fall Meeting, another workshop will be held in Nanjing University, Nanjing, China in summer 2019 with the aim to engage the broader international scientific community, focusing on regional climate modeling (RCM) intercomparison and the effect of light-absorbing particles in the snow (LAPS).

While RCMs have shown skillful downscaling ability in S2S regional prediction in different regions of the world, modeling of S2S TP weather/climate and associated prediction of rainfall in downwind regions remain scientifically challenging due to the scarcity of observations and the complex topography of the TP. Large RCM simulation biases have been identified over this region. It is imperative to validate RCMs with observational data in simulating the TP climate with high horizontal resolution and to identify causes of model deficiencies. In addition, while current experiments exploring the LST/SUBT effect are most conducted using the Earth System Global models (ESM), it is important to evaluate the RCM's ability in simulating the LST/SUBT remote effect and in adding values through dynamic downscaling by using the ESM LST/SUBT experiments results as lateral boundary conditions.

Another important factor that affects LST/SUBT and snow is the presence of LAPS. LAPS influence water and energy budgets of the atmosphere and snowpack in multiple ways: LAPS reduces snow albedo and increases absorption of solar radiation by the land surface, i.e., snow darkening effect (SDE). It has been suggested that SDE has greater warming and snow-melting efficacy than any other anthropogenic agent, owing largely to a series of positive hydroclimate feedback mechanisms. LAPS were identified as one of major forcing agents affecting climate change with high degree of uncertainty in IPCC AR4 and AR5 (IPCC, 2007, 2013).

The TP is located close to densely populated regions in South and East Asia that possess abundant sources of black carbon (BC) in the world. BC from industrial pollution, BC and organic carbon (OC) from wildfires and burning of agricultural wastes are plentiful in the Himalayas-Gangetic Plain. Himalayan ice core records indicate a significant increase in deposition of both BC and OC over the northern slope of the TP, especially since 1990. Meanwhile, large quantities of desert dusts from the Middle East are transported by southwest monsoon winds, and eventually deposit on the snow surface at higher elevations. Variability in LAPs in TP snow may trigger large spring LST/SUBT anomalies there. Therefore, it is critical to quantify the LAPS impact on the snowpack and surface temperature over TP, in order to improve the S2S prediction skill associated with the LST/SUBT over TP.

The Workshop presentations will cover:
(1). The available field and satellite measurements and assimilation data in the TPE regions.
(2). Assessments of RCM downscaling ability in the TP region to realistically simulate the TP climate pattern and surface water and energy balances as well as identify possible causes for model biases.
(3). The possibility of value-added information in the design and validation of RCM for LST/SUBT rainfall predictability study
(4). The sources of LAPS in TP and its spatial and temporal variability, and
(5). LAPS impact on snow, LST/SUBT, and surface hydrology, and S2S prediction.
(6). Other subjects that related to the LS4P project

In addition to invited and contributed presentation, the Workshop will also include sub-group discussions on the next stage's TPEMIP RCM and LAPS experiments, July 8 – July 9. The workshop will be concluded at the noon, July 9. For those who need travel support, please send email to yxue@geog.ucla.edu. Local Organization Committee will provide limited support based on the need and fund availability.

Local Organization Members: Weidong Guo (Nanjing University), Weicai Wang (TPE), Miao Yu (NUIST)

Workshop Venue and Hotel: The International Conference Center, Nanjing University, Nanjing China, http://ndgjhyzx.com/en/index.asp.

Deadlines: The titles of presentation and the presenter's name should be sent to Yongkang Xue (yxue@geog.ucla.edu) and Ismaila Diallo (idiallo@ucla.edu) before May15, 2019 and abstracts should be sent to Ismaila Diallo by July 1, 2019.

The workshop programs will be available in early June at the LS4P website: http://ls4p.geog.ucla.edu/.