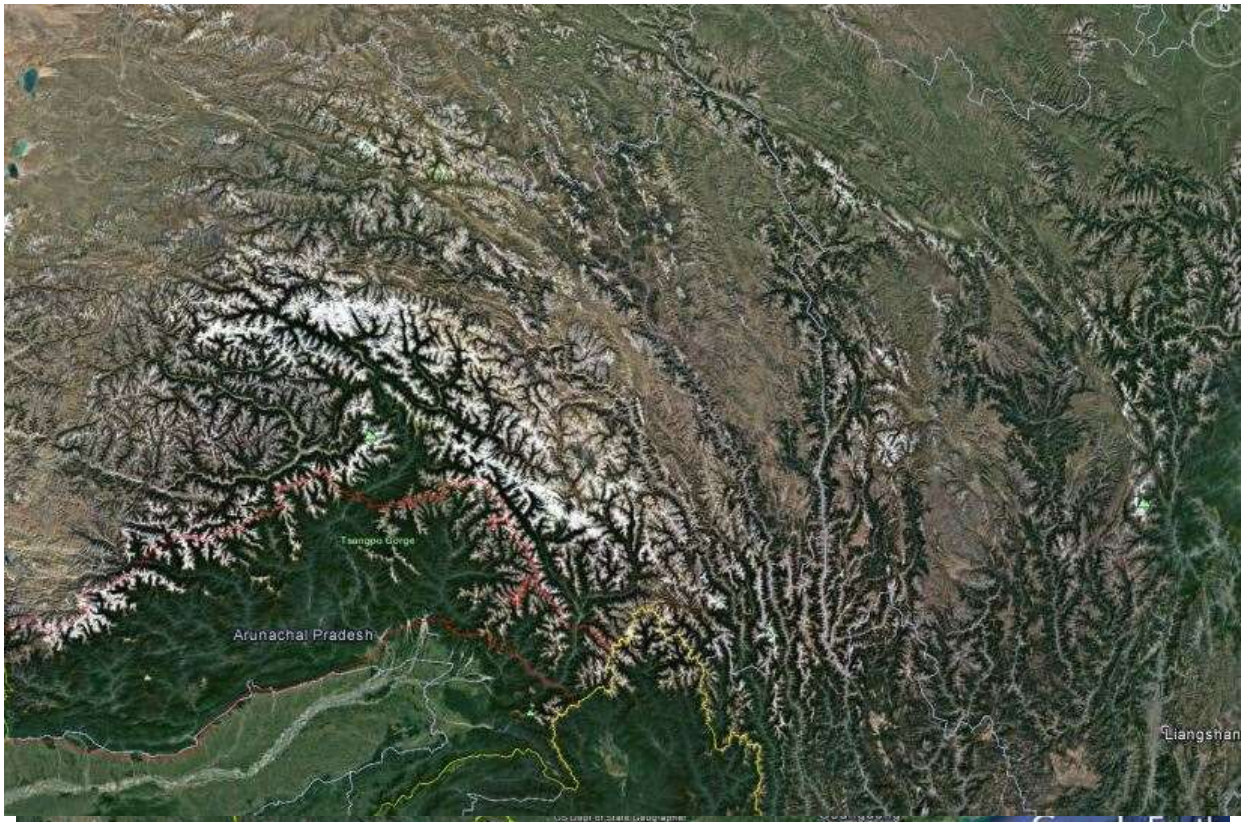
8th EARSeL Land Snow and Ice Workshop

Hong Xiaofeng [1], Yu Yangyue [1], Michael Baumgartner [2]

[1] Changjiang River Scientific Research Institute, Changjiang Water Resources Comm., China; [2] MFB-GeoConsulting

Snow Cover Monitoring and Snowmelt Runoff Modeling in the Upper Jinsha River Basin (China)

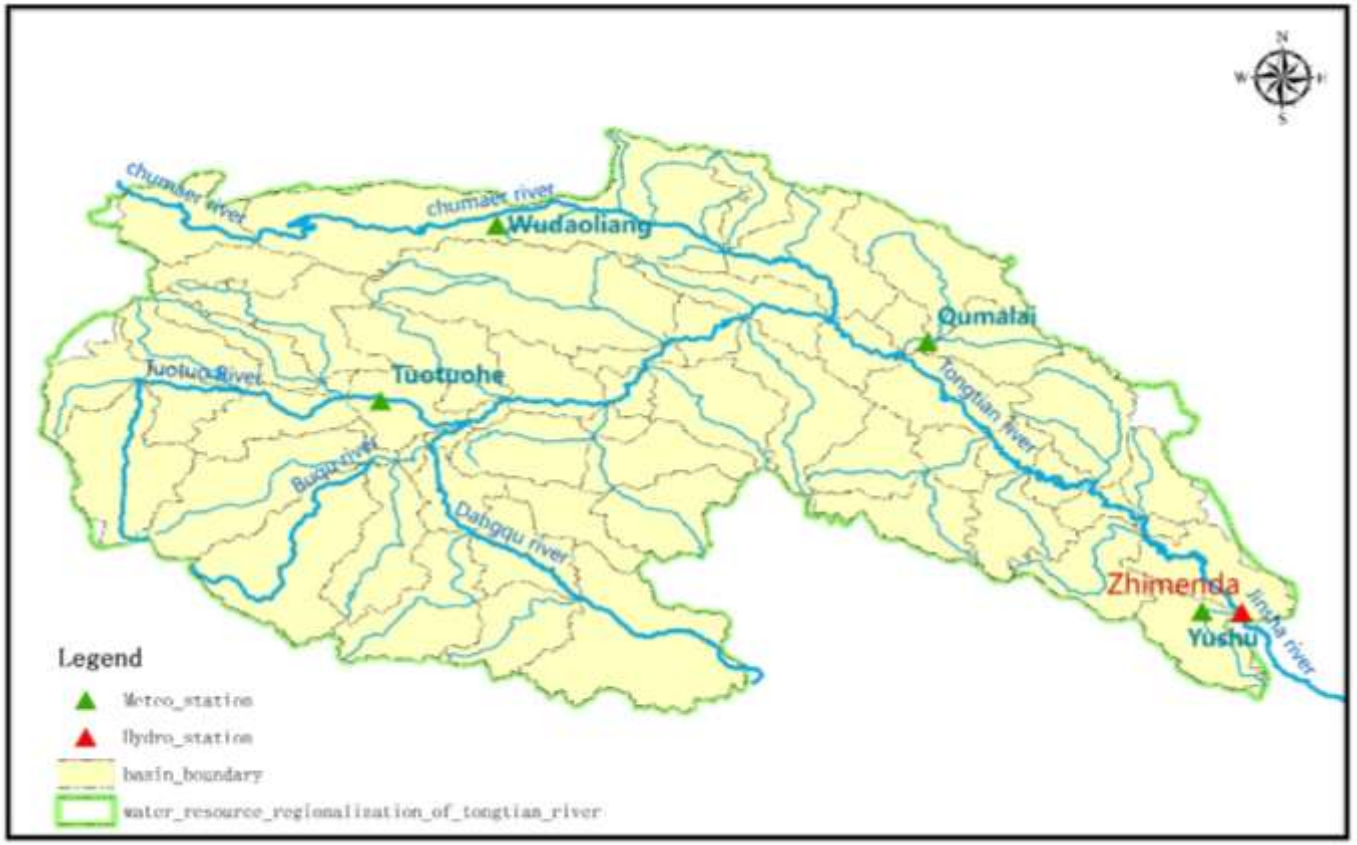


Jinsha River / Changjiang / Yangtze



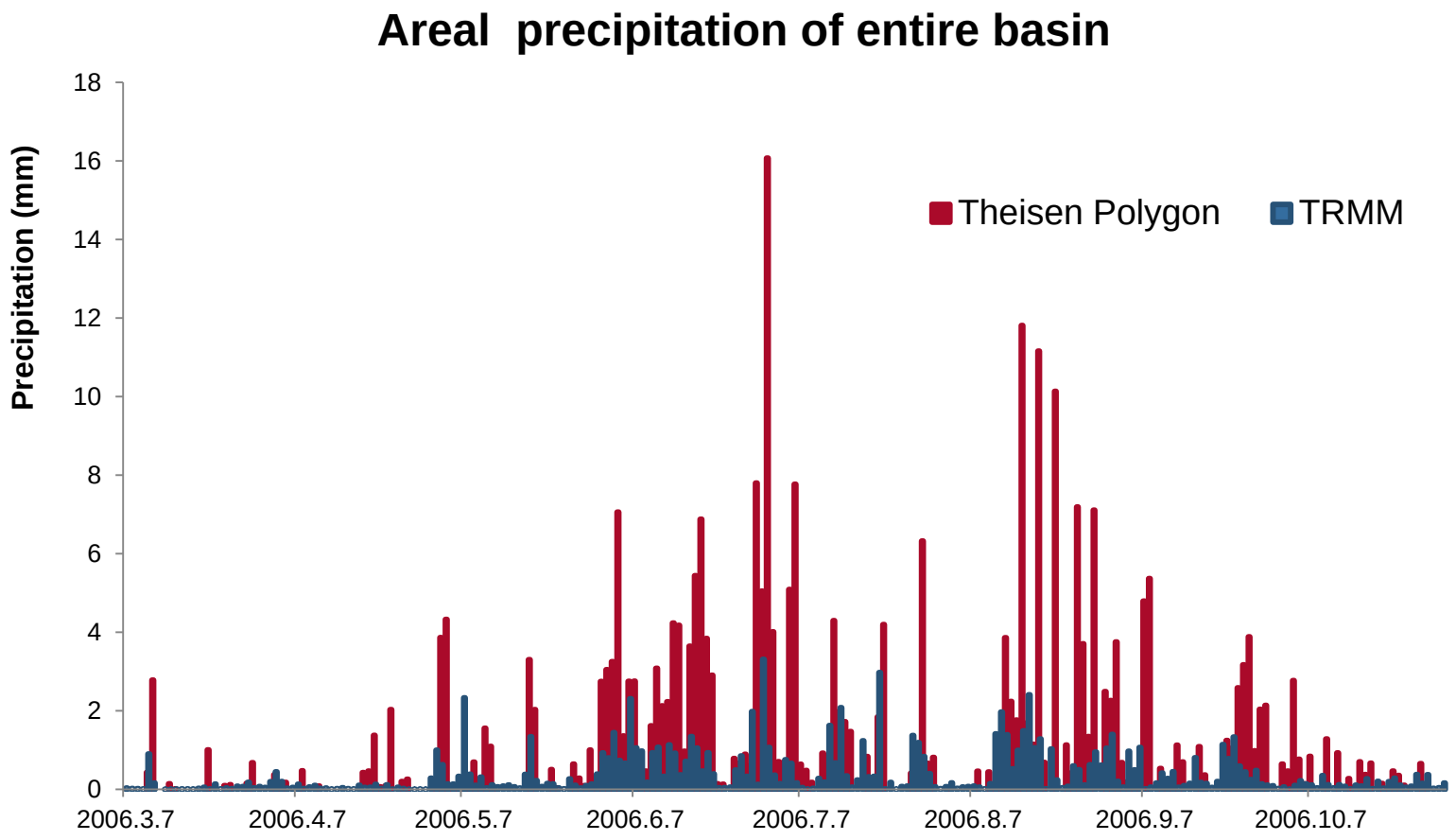
Length: 6,300km; area: 1,808,000 km^2; ▲ stream gauge Zhimenda

Jinsha Basin (source basin); 138,000 km^2



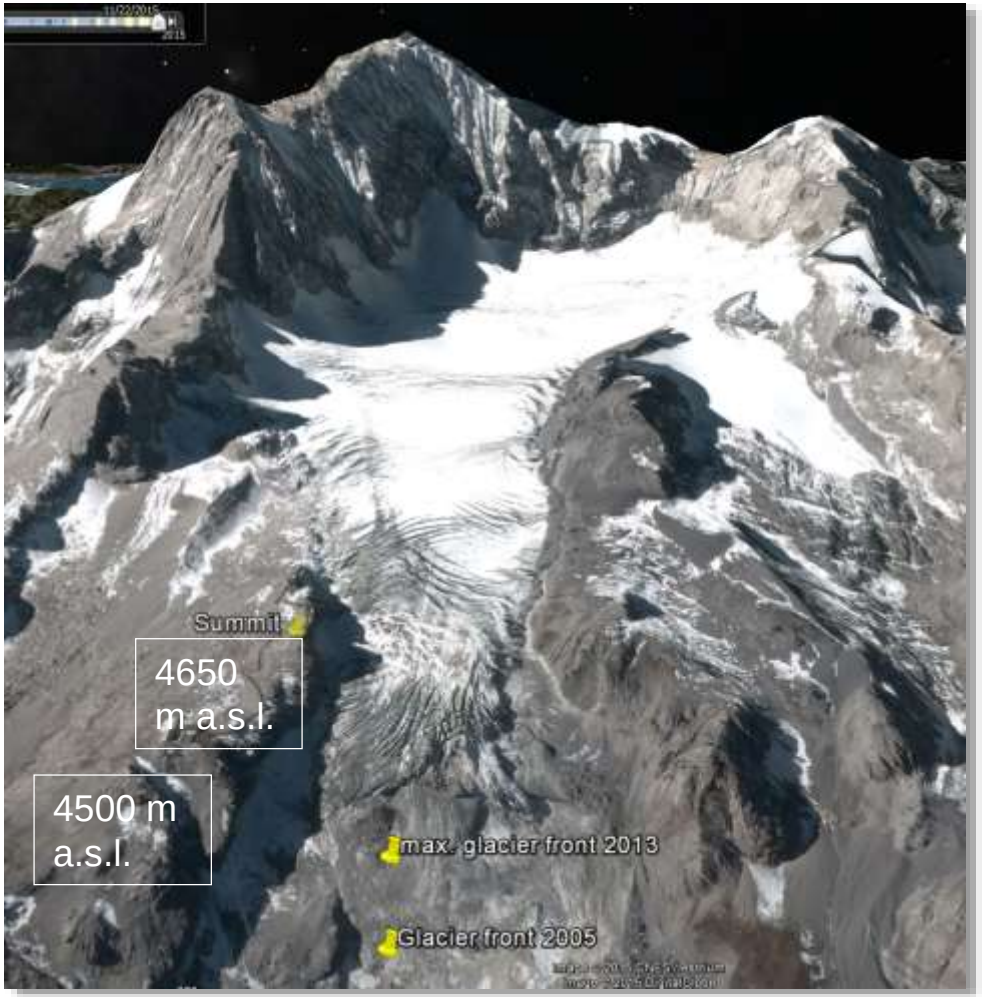
Zhimenda (stream gauge)
Yushu, Qumalai, Tuotuohe, Wudaoliang (meteo stations)

TRMM and Thiessen Polygon



tropical rainfall measuring mission – TRMM

Yulong Snow Mountain – glacier No. 1



Terrestrial Monitoring Station (Geotest / Geopraevent)

Goal:

- Installation of a terrestrial monitoring station
- Weather sensors and cameras
- Monitoring snow and glacier changes

Data and Tools:

- Monitoring station
- Weather sensors
- 3 cameras
- Data logger
- Battery and solar panel
- Data transmission (satcom and GMS)



Access via website for all parties involved

Installation of terrestrial monitoring station





Results: online data platform (1)

GEOPRÄVENT MESSNETZ

Willkommen, Jinsha River Basin - midterm conference!
Benutzerdaten
Logout

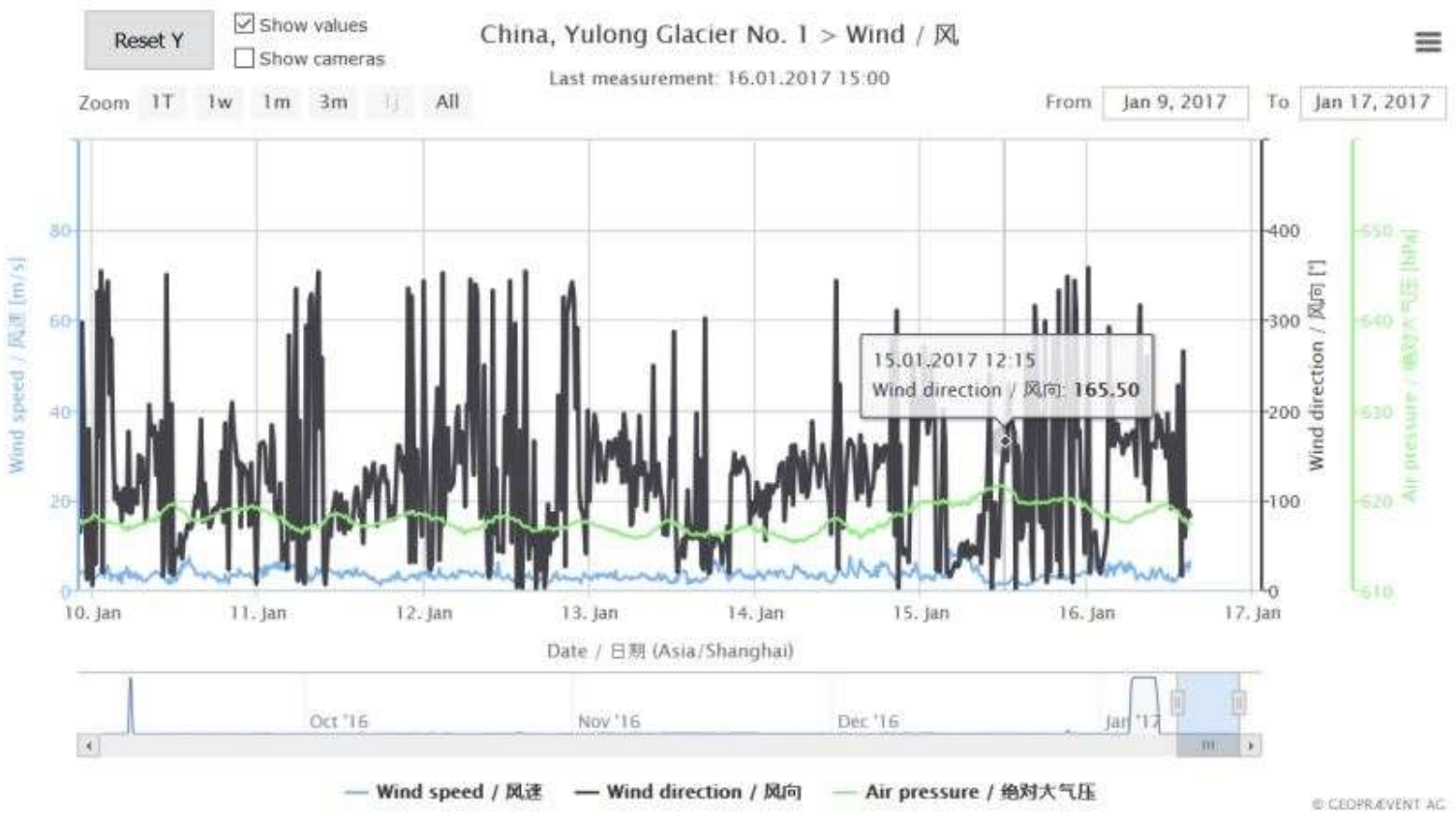
Aktive Anlagen

China, Yulong Glacier No. 1 (1)

Anlagen Standby

Inaktive Anlagen

| Mitteilungen | Info | Wind / 风 | Weather / 天气 | Cam up / 摄像机 1 | Cam middle / 摄像机 3 | Cam down / 摄像机 2 | Service / 服务数据 | Raw Data / 原始数据 |



Results: online data platform (2)

GEOPRÄVENT MESSNETZ

Willkommen, Jinsha River Basin - midterm conference!
Benutzerdaten
Logout

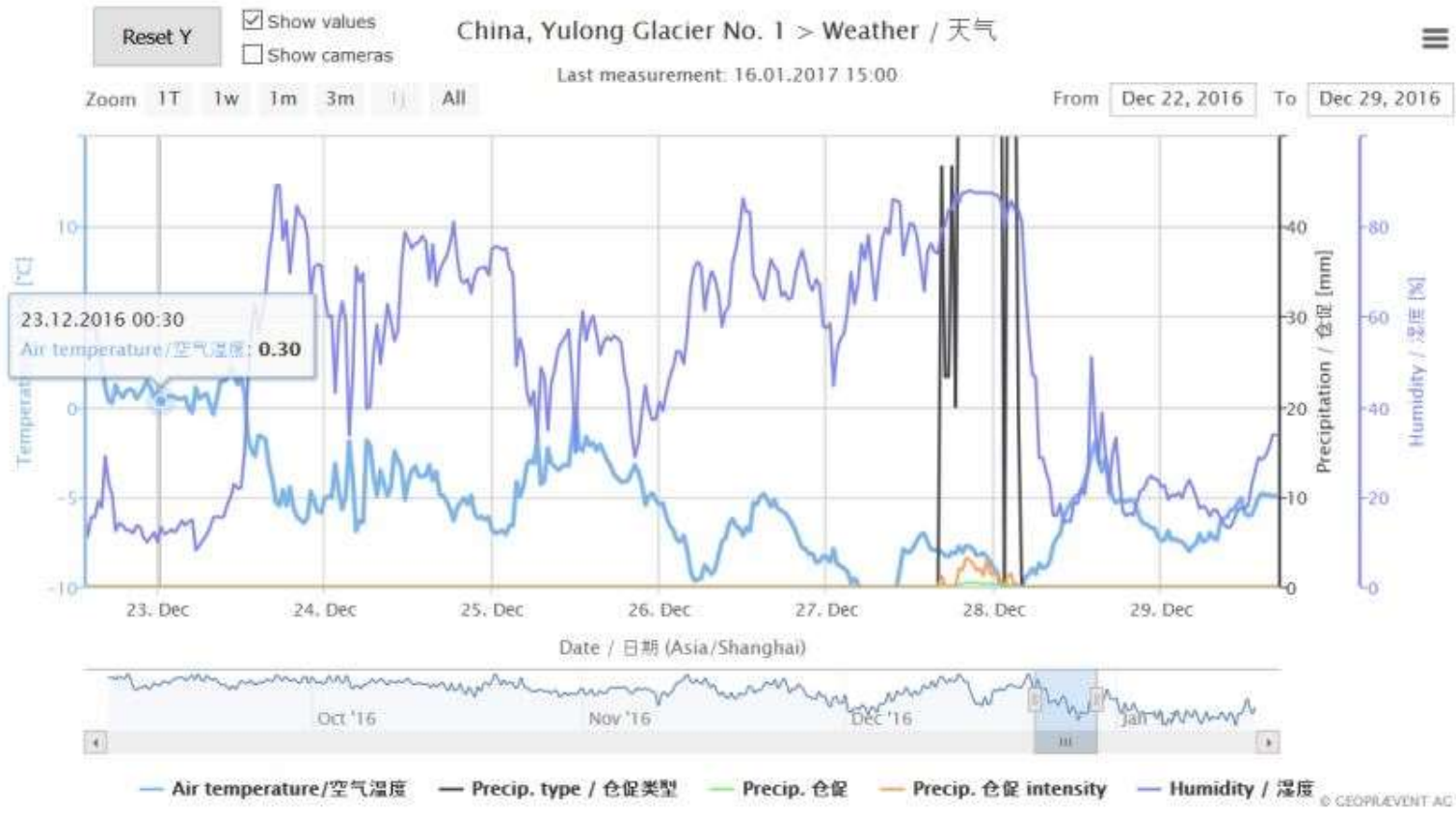
Aktive Anlagen

China, Yulong Glacier No. 1 (1)

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Webcams



Satellite RS Snow Cover Monitoring & Snowmelt Runoff

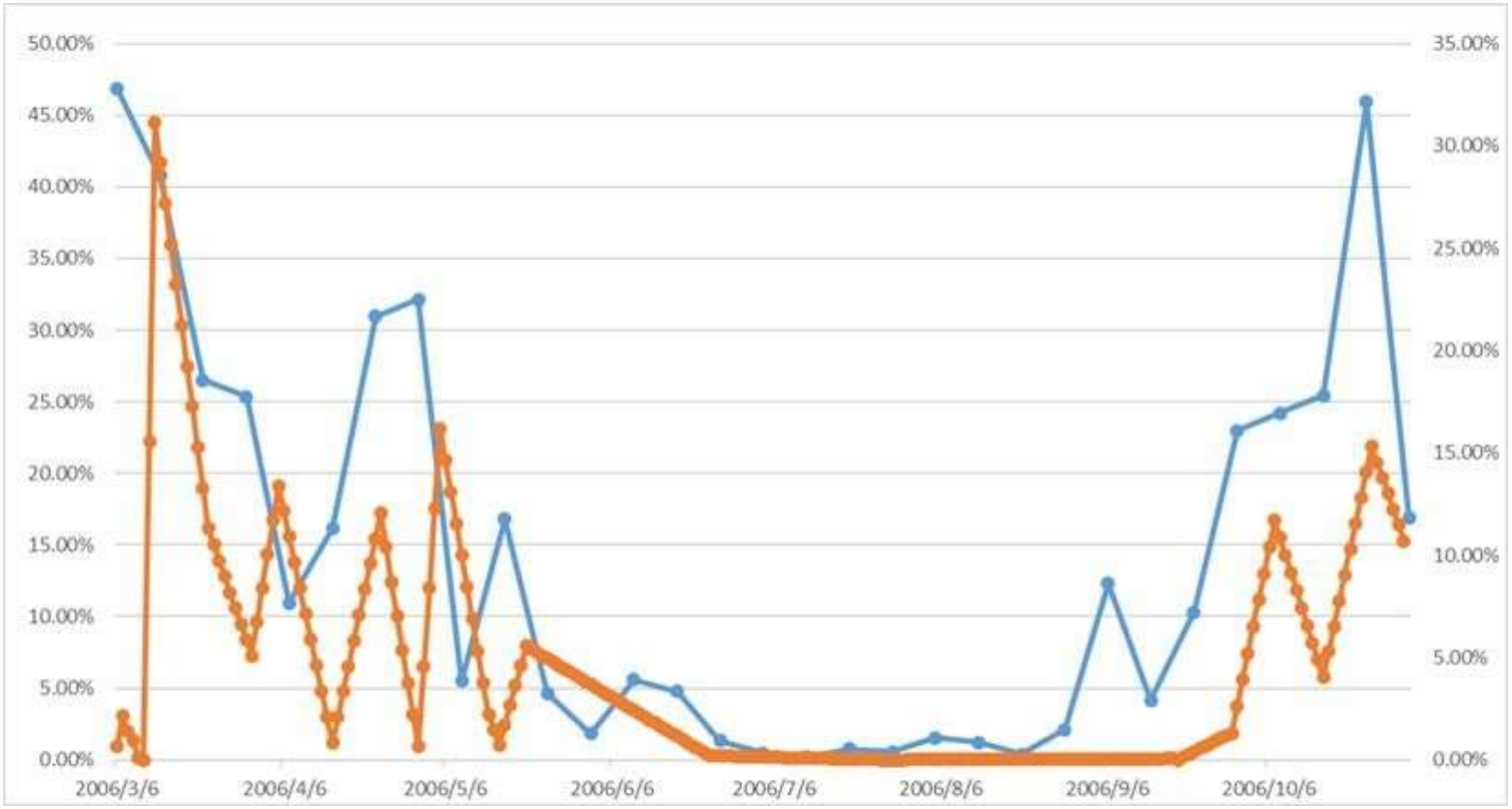
Goal:

- Overview on the snow accumulation and ablation patterns
- Snowmelt runoff simulation – contribution of snowmelt to runoff
- Significance of snow cover in a changing climate

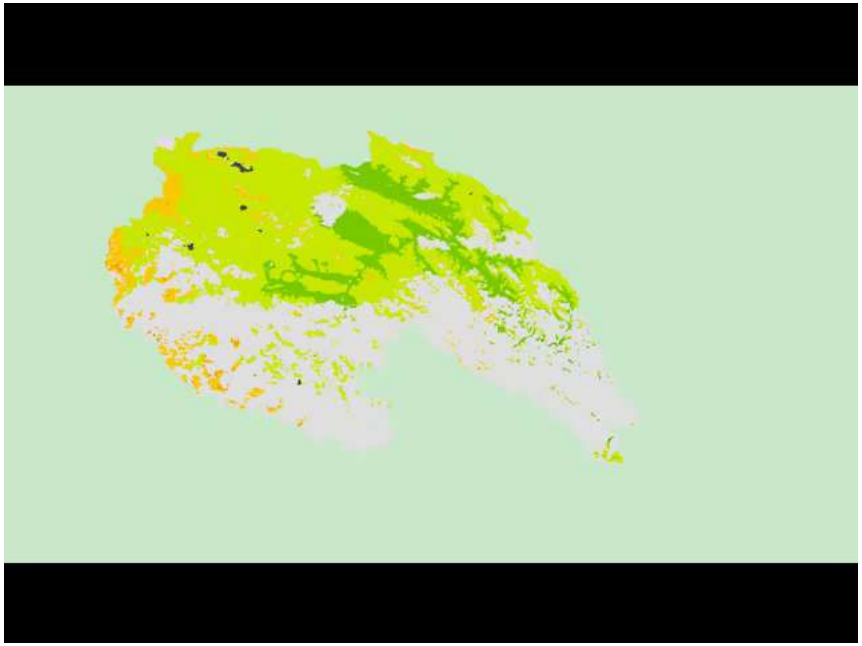
Data and Tools:

- MODIS satellite data - snow cover products
- Digital elevation model
- Runoff, temperature & precipitation data
- Geographic information and image processing systems
- Snowmelt runoff model

Snow Cover Variations; MODIS 8-day and 1-day Data

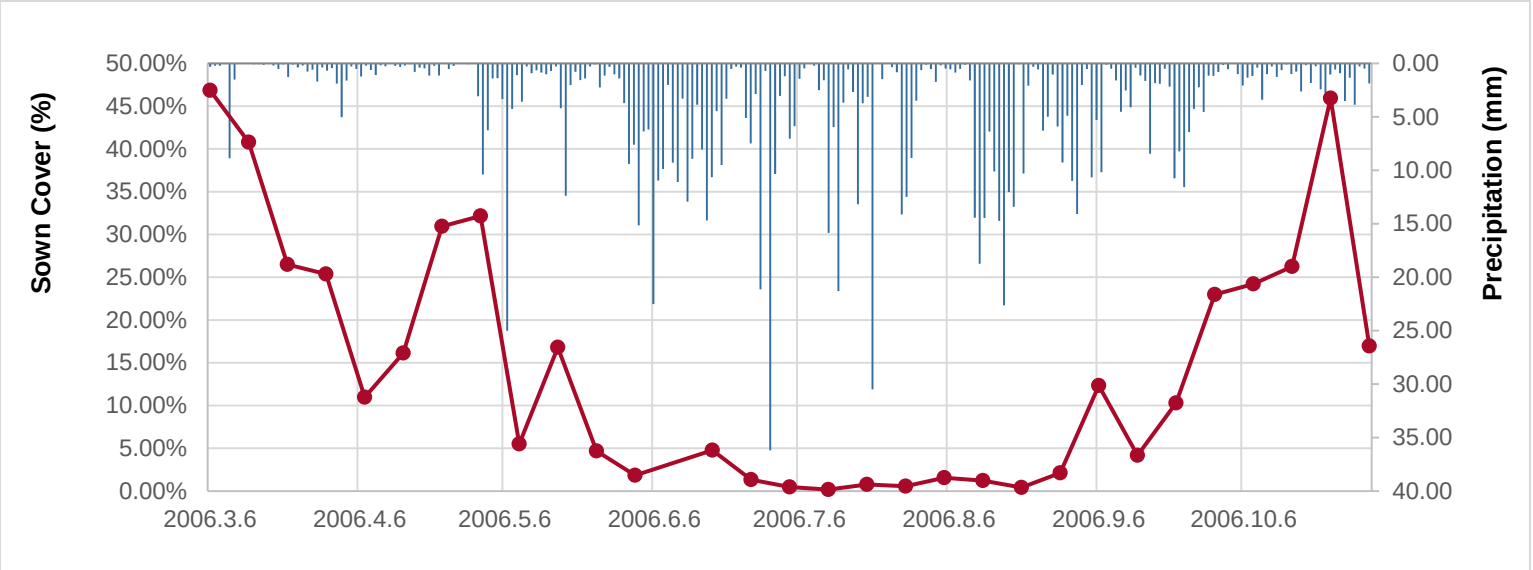


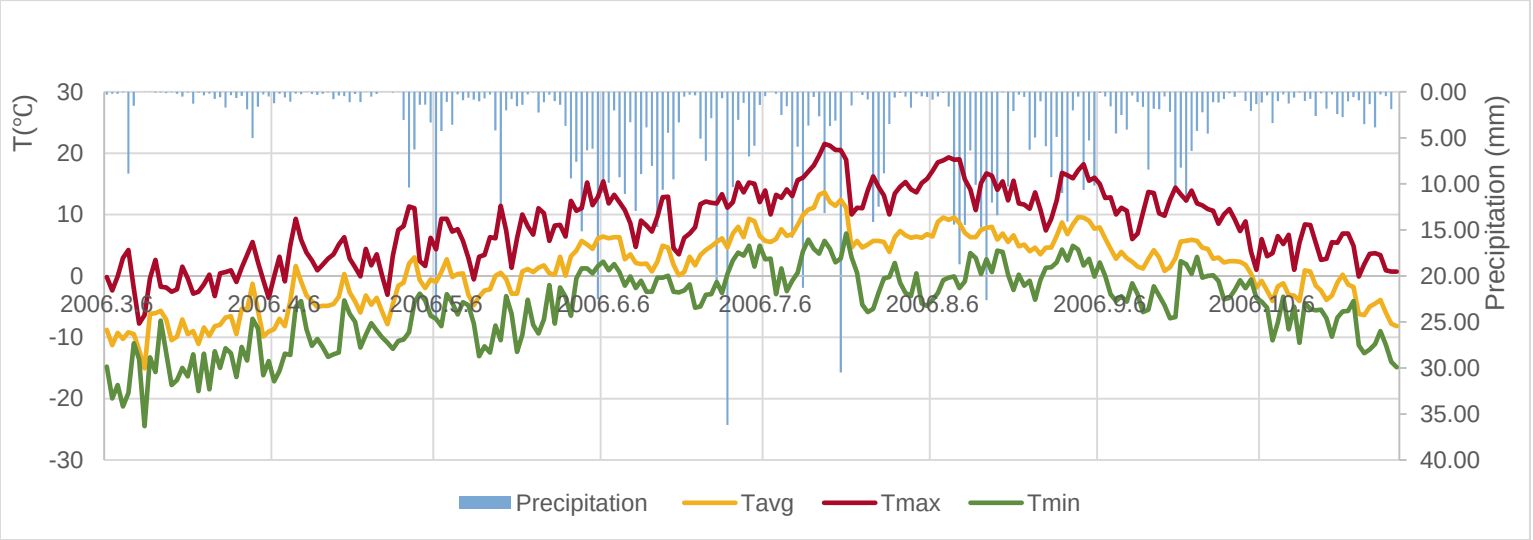
MODIS 8-day average snow cover maps



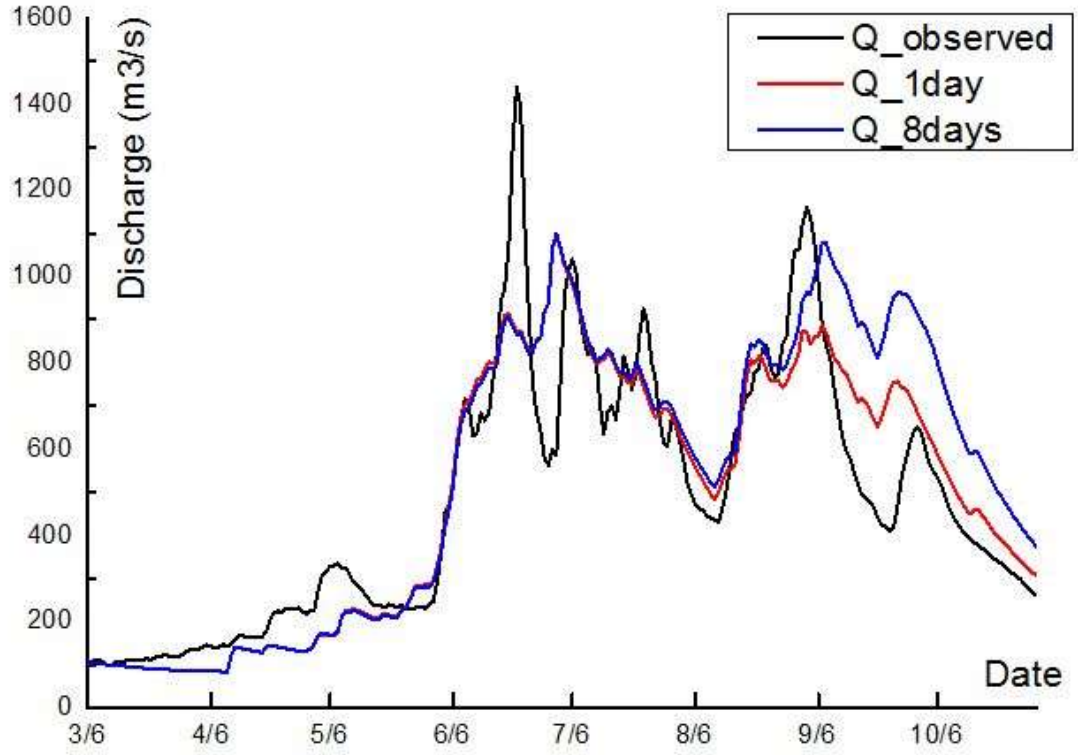
time-series snow-cover maps March – August 2006
years: 2005, 2006, 2009

Snow Cover, Temperature and Precipitation from TRMM





Snowmelt Runoff Simulations using SRM



Outlook

Snow cover from MODIS data:
- Assumption: continuous accumulation and ablation
- Fact: single snowfall events, no long-lasting snow cover

Precipitation:
- Assumption: precipitation are better represented by Thiessen polygons than from a single station (differences in climatic situation at each station)
- Fact: Thiessen polygons (from 4 meteo stations) produce 9x as much precipitation as in reality
- TRMM data better represent precipitation

To Does:
- Study of entire hydrological year, several years
- Detailed study in sub-basins needed
- Significance of snow cover in a changing climate