Title:
Climate and Snow Model Simulations over INARCH basins for the COPE

Ethan Gutmann

Abstract:
The Common Observation Period Experiment (COPE) taking place as part of the second phase of International Network for Alpine Research Catchment Hydrology (INARCH) provides an excellent opportunity to evaluate models of mountain hydro-climate. Here we present a collection of model simulations over many of the INARCH basins for 1) climate and meteorological downscaling and 2) high-resolution snow modeling. We will show current results from the Intermediate Complexity Atmospheric Research model (ICAR) downscaling climate models from the Coupled Model Intercomparison Project phases 5 and 6 (CMIP5 and CMIP6). ICAR is being run over western North America, the High-Mountain Asia "third-pole", the South American Andes, and the Alps. We will examine simulations in current climate using reanalysis data for the boundary conditions such that the model output can be compared with the COPE observations, and show early climate change simulations from CMIP runs. In addition, a limited set of very high-resolution (100m grid) SnowModel simulations have been performed over most of North America, and these simulations will be compared with airborne lidar observations of snow depth. Output from these model simulations can be provided to any basins of interest. We would like to solicit feedback and discuss how these simulations can be used to better understand alpine catchment hydrology, and how INARCH data can be used to improve our model simulations.