

HMA-LDAS: Hyper-Resolution High Mountain Asia - Land Data Assimilation System

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The overall goal of this project is to study surface flux, snow/ice storage, and water balance changes in HMA and investigate the causality of these changes at the regional to local scale. To this end, in coordination with NASA-Goddard Space Flight Center (S. Kumar) we are developing a hyper-resolution 1-km High Mountain Asia (HMA)-Land Data Assimilation System (LDAS) 1980-current terrestrial reanalysis using the Community Land Model and the Community Ice System Model, forced by physically downscaled surface meteorology, parameterized by remotely sensed topography and vegetation, and constrained by remotely sensed snow, temperature, and glacier observations. The 4.3 million km² HMA-LDAS will be proposed as a critical component of the Glacial Melt Toolbox (GMELT) and will help to address causality of HMA water balance changes across scales. Our work focuses on (1) development of a downscaled hyper-resolution land forcing dataset, (2) inclusion of a glacier model in LIS, and (3) assimilation of the binary remote sensing states of landscape freeze/thaw, snow extent, and glacier extent. Our recent work has been to demonstrate a hyper-resolution downscaled precipitation product that will be shared at this meeting.