Poster #1-7

Observation-Informed Watershed-Scale Simulation of Terrestrial Processes Using ATS at the NGEE Teller Site

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Continued warming of the Arctic system is currently driving rapid and transformative change in high-latitude landscapes. These ice-rich ecosystems are particularly sensitive to perturbations, and many of the processes that dictate system behavior are inextricably linked. For example, hydrological factors exert a dominant influence on biogeochemical processes and play a large role in determining the rates of CO_2 and CH_4 fluxes. To better understand the complex process interactions occurring as these systems change, we are simulating hydrology and permafrost dynamics in the Teller watershed with the Advanced Terrestrial Simulator (ATS). Teller watershed contains areas with near-surface, deep, and no permafrost, and can be considered to be representative of discontinuous permafrost systems. Observations suggest the watershed has an active and well-connected subsurface hydrologic system. This work utilizes many streams of observational data in a single integrated framework, providing the opportunity to refine our understanding of system behavior under current or past climatological conditions. The simulations will also serve as a numerical laboratory, allowing observations of process interactions and feedbacks in response to specific perturbations.