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Conflating meteorological and hydrological models for enhanced feedback representation of the water cycle.

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Process-based hydrological and dynamical meteorologic models are highly developed tools that describe meticulously the physical properties and dependencies of their respective realms. However, meso-scale meteorological models often overlook lateral water transport at the land surface and below, while hydrological models typically lack representations of atmospheric dynamics. Fully coupled atmospheric-hydrological modeling systems enable integrated studies of the terrestrial hydrosphere, considering crucial feedback processes. We examine the significance of model coupling on water and energy budgets based on different studies focused on integrated modeling, and land-cover and land-use change.

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