



## **PF-CONUS 2.0: Advancing continental-scale integrated hydrologic modeling over North America**

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Understanding the movement of water in the earth system is important for sustaining ecosystems, municipal, agricultural and industrial consumption. Continental scale simulation of this flow of water through rivers, streams and groundwater is among the tools that can be used to provide this insight. Here we discuss advancements to PF-CONUS 2.0, an integrated hydrologic model of the watersheds contributing to flow over the entire United States. This model is aligned with the US National Water Model and provides enhanced capability beyond that operational framework. Simulations using this model explore connections between components of the terrestrial hydrologic system. We also discuss a model coupling framework built upon the integrated hydrology model ParFlow and WRF-Hydro. Examples highlighting differences in connection created by model parameterizations are presented. Shifts in insight with resolution and scale, moving from highly instrumented headwaters catchments out to the continent are shown. Finally, changes in model behavior under stress and land cover perturbations are used to help inform water management.