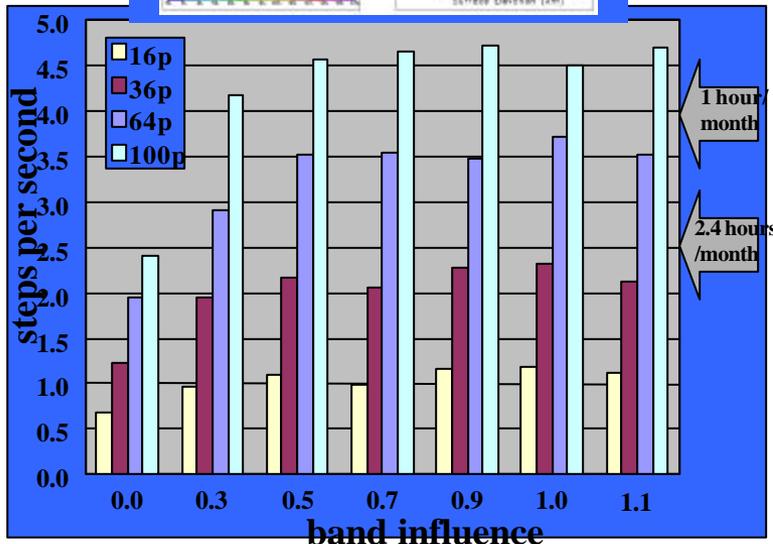
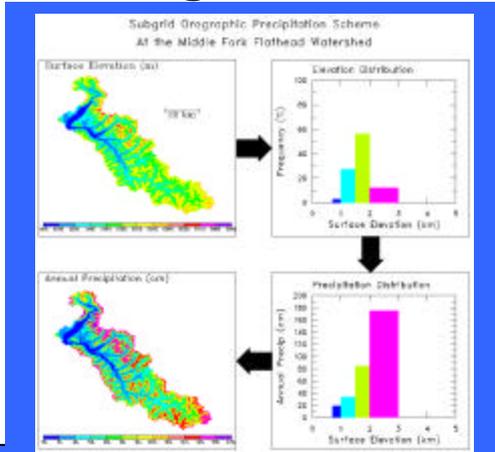


Pilot-23 Highlight

PNNL

Modeling Climate Change and Impacts at the Regional Scale



A prototype Regional Climate Collaboration Center (RCCC) has been assembled that makes use of a regional climate model, a watershed hydrology model, a hydrosystem management model, and a crop model, for the purpose of assessing regional impacts of global climate change. A subgrid orographic precipitation scheme has been implemented to the Penn State/NCAR Mesoscale Model (MM5) to simulate regional climate. The model runs on a wide variety of parallel computing platforms using two-dimensional decomposition with shared or distributed memory. Because computational burden increases with increasing number of subgrid elevation bands, a parameter called band-influence is used to control the dependence of the decomposed domain size on the number of subgrid elevation bands. An optimal balance can be achieved by adjusting this parameter *a priori* for each simulation domain.

Leung, L.R., J.G. Michalakes, and X. Bian. 2001. "Parallelization of a Subgrid Orographic Precipitation Scheme in an MM5-based Regional Climate Model." *Lecture Notes on Computer Science*, Springer Verlag, New York, pp. 195-203.

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