

P48 A mosaic approach to land cover characterization in MPAS-A.

Campbell, Patrick C., Jesse O. Bash, Jerold A. Herwehe, and Robert Gilliam, *United States Environmental Protection Agency*

A tiling (or mosaic) approach to subgrid-scale land cover characterization (LCC) is currently implemented as an option in the Noah land surface model in WRF. Using Noah mosaic landuse in WRF has shown improved model performance and less sensitivity to the spatial grid resolution for surface temperature, humidity, and heat fluxes compared to the dominant (i.e., most abundant tile) approach to LCC at regional scales. The Noah implementation in global MPAS-A, however, only uses the dominant LCC approach. This results in an oversimplification in regions of highly heterogeneous LCC (e.g., urban/suburban settings), and has additional uncertainty when using gradual mesh refinement in MPAS-A for global to mesoscale applications. Thus, in this work we implement the Noah mosaic approach from WRF as an option in MPAS-A, and preliminary results show important changes in global soil and meteorological predictions, and has improved model performance compared to the dominant approach, most notably for regions in the U.S. To our knowledge, this is the first implementation and assessment of a mosaic/tiling approach to LCC in such a global model, and has potential implications for the development and application of a next generation air quality modeling system.