

9.3 Sensitivity of urban canopy and land surface models to input land cover data.

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State-of-the-art representation of land cover used in the Weather Research and Forecasting model (WRF) rely upon the 30-meter resolution National Land Cover Database (NLCD) products. However, within urban areas, the categorical NLCD loses information of non-urban classifications whenever the impervious cover within a grid cell is 0%. Additionally, the current method to determine urban area from these data yields an overestimate of the actual area, leading to a bias of urban contribution. To address these sources of bias within urban areas an investigation employing a 1-meter resolution land cover data product derived from the National Agricultural Imagery Program (NAIP) dataset is presented. Scenes during 2010 for the Central Arizona Phoenix Long Term Ecological Research (CAP-LTER) study area, roughly a 120 km x 100 km area containing metropolitan Phoenix, are adapted for use within WRF to determine the areal fraction and urban fraction of each WRF urban class. A method is shown for converting these NAIP data into classes corresponding to NLCD urban classes, and is evaluated in comparison with current WRF implementation using NLCD. Results are shown for comparisons of land cover products at the level of input data and aggregated to model resolution (1 km). The sensitivity of WRF short-term summertime pre-monsoon predictions within metropolitan Phoenix to different input data products of land cover, to method of aggregating these data to model grid scale (1 km), for the default and derived parameter values are examined with the Noah mosaic land surface scheme adapted for using these data.