Experiment on Utilization of AWiFS Lu/Lc Data in WRF Meso-Scale Model

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This study implements a new land use land-cover classification (LULC)data over India obtained from the Advanced Wide Field Sensor (AWiFS) aboard the Indian satellite IRS P6 in the Weather Research and Forecast (WRF) model and investigates its effects on regional near-surface atmospheric state variables as well as the planetary boundary layer over India during July 2009. A detailed intercomparison of the model's response to the AWiFS LULC data as against the USGS LULC data is also studied.

The AWiFS data over India during 2007-2008 look very much different from that of USGS generated during April 1992 to March 1993 based on the NOAA AVHRR images. The AWiFS data appears more realistic (than USGS) since it features the recent changes in the land cover over India. The WRF model experiments using the AWiFS and USGS data show consistency in the domain averaged monthly surface fields suggesting that the WRF model (and the NOAH LSM) accepts the AWiFS data.

The mean flow in the AWiFS run is significantly altered (direction and magnitude) compared to the USGS run to suggest that the land cover changes over wide geographical region influence not only micro-meteorological features but also large scale circulation patterns up to 850 mb. The AWiFS run shows reduction in 2 meter mean water vapor relative to USGS run suggesting slightly drier mean conditions with isolated locations showing strong positive changes. Over the Jammu & Kashmir region the impact of AWiFS data in the simulated surface parameters is alarming. The *degraded* area shows reduced rainfall while the *improved* area to its south shows enhanced rainfall. Change in 2 meter temperature rather astonishes with the zone of reduced rainfall show sharp increase in 2 meter temperature as against marginal fall over *improved* area.