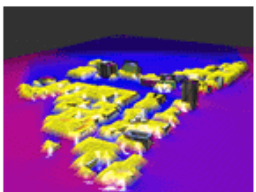# URBAN BUILT FORM AND URBAN MICROCLIMATE

Micro-scale Methods

Urban morphology such as geometry of buildings, orientation and arrangements of building and vegetation play a major role in wind-flow pattern in urban areas
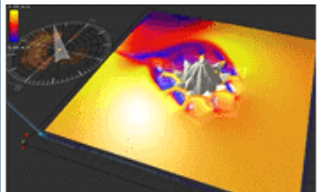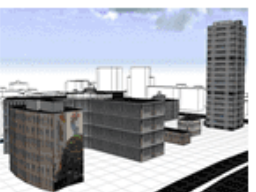
CFD BASED METHODS

Lotus Temple, Delhi
(Google Sketch up)

Wind flow around
I P Estate, Delhi

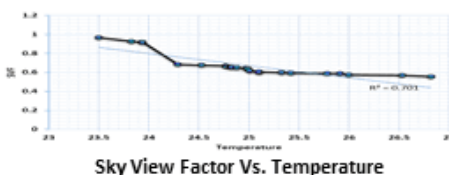Wind flow around Lotus Temple

Textured 3D model, IP Estate, Delhi (Cartosat-1)

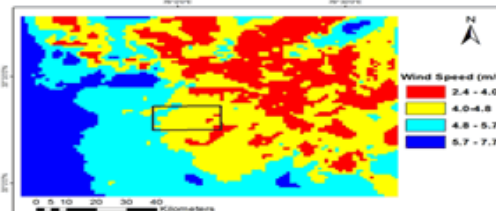### ROUGHNESS/ MORPHOMETRY BASED METHODS

Software developed for automated estimation of urban morphometric parameters e.g., Sky View factor, Roughness length, Zero Plane displacement height etc.
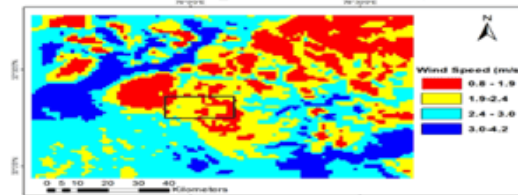

Sky View Factor Vs. Temperature

Meso-scale Methods

INTEGRATED WRF-URBAN MODELING
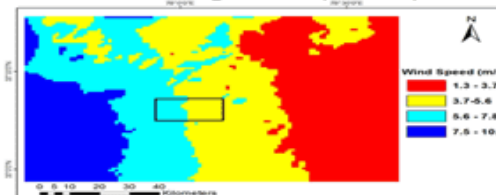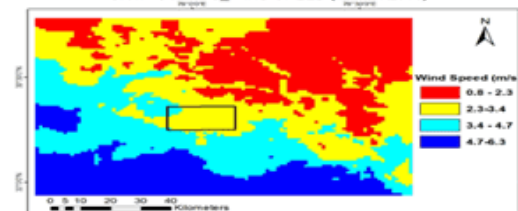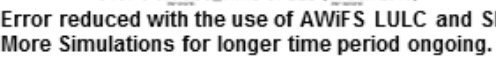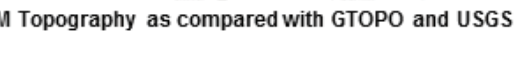
- Error reduced with the use of AWiFS LULC and SRTM Topography as compared with GTOPO and USGS LULC.
- More Simulations for longer time period ongoing.

INTEGRATED WRF-URBAN MODELING- VALIDATION

Aug 6, 2014– Aug 8, 2014

USGS+GTOPO

AWiFS+ SRTM

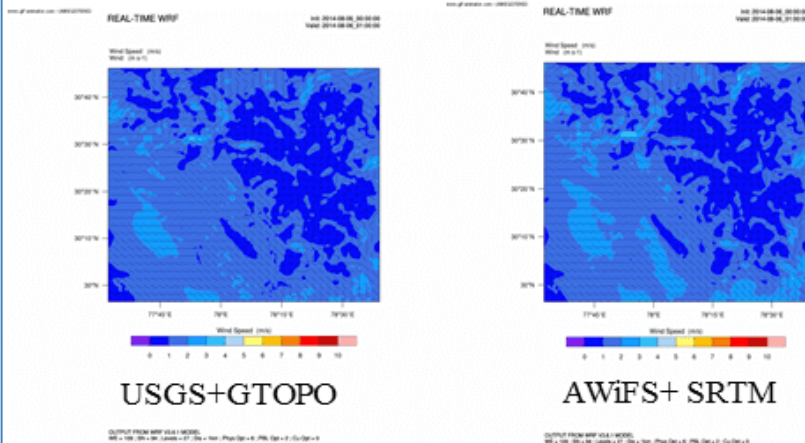| Statistical analysis of simulated data with respect to observed ground station data (IMD Karanpur)				
GTOPO and USGS-JUN2013 (1 km)				
Period	RMSE	MAE	BIAS	SD
14 Jun 2013	4.96	1.98	1.97	2.99
15 Jun 2013	5.41	2.26	2.26	1.83
16 Jun2013	5.10	2.14	2.21	2.18
SRTM90 and AWiFS (56)-JUN2013				
Period	RMSE	MAE	BIAS	SD
14 Jun 2013	1.83	1.25	1.22	0.94
15 Jun 2013	2.92	1.57	1.54	1.61
16 Jun2013	4.04	1.83	1.77	2.45

- RMSE, R-Square, Mean Absolute error, BIAS and Standard Deviation values – reduced with the use of AWiFS LULC and SRTM Topography-High Resolution
- Better results could be obtained with improved urban parameterization.