

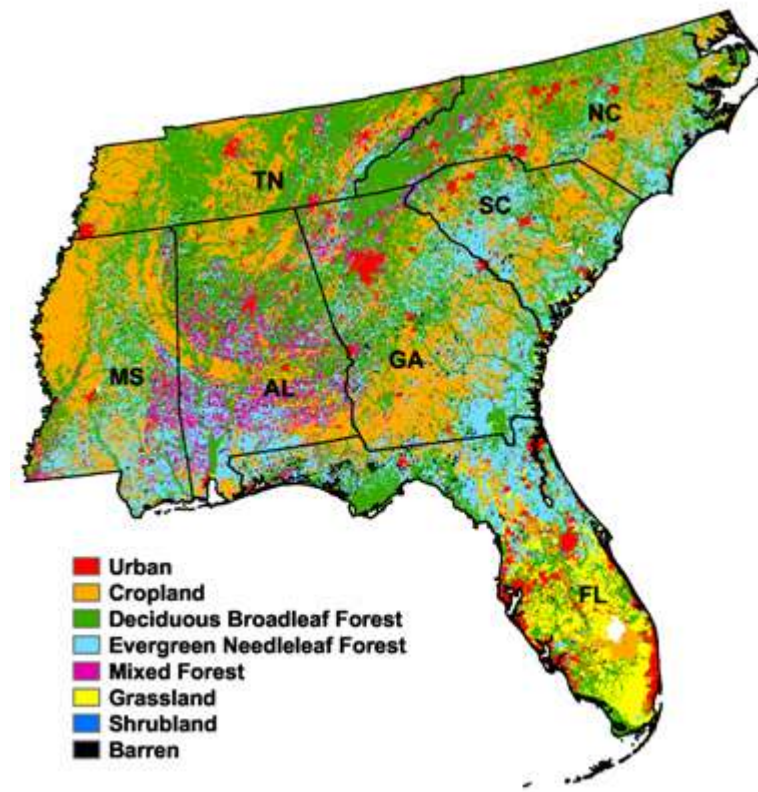
# S. E. USA Study

Cristina Milesi, Christopher D. Elvidge, Ramakrishna R. Nemani and Steven W. Running (2002). Assessing the impact of urban land development on net primary productivity in the Southeastern United States. *Remote Sensing of Environment* (accepted)

2001 MODIS NDVI



Land Cover from the 1992 National Land Cover Data set



Satellite derived photosynthetic capacity is combined with average climatic conditions and a land cover in an ecosystem model (Biome-BGC) to estimate NPP.



Extent of recent land development (1992-2000) was estimated from **DMSP/OLS nighttime data**, using average Digital Numbers from cloud-free portions of orbits collected during the months of September through November of 1992-93 and 2000.

Urban land development affected almost 2% of the surface of the southeastern United States. The most extensive sprawl was reported for the states of Georgia, Florida, North and South Carolina.

## Results

The 1.9% increase in the urban surface of the southeastern United States comes with an average loss in NPP of 180 g of carbon per square meter, with a total of 3.04 Tg ( $10^{12}$ ) of carbon per year (compare with a total 1992 NPP for the whole region of 870 Tg of carbon per year).

Reasons for moderate loss in NPP are high tree cover of urban areas and abundance of fertilized golf courses.

State	Loss in NPP due to urban land development	
	Unit loss ( $g\ m^{-2}\ y^{-1}$ )	Total loss (Tg $y^{-1}$ )
Alabama	221	0.38
Florida	153	0.55
Georgia	204	0.63
Mississippi	196	0.26
N. Carolina	178	0.54
S. Carolina	194	0.37
Tennessee	163	0.30
SE-US	183	3.04

## Future Plans

Future work includes estimation of the effect of impervious area on NPP for the whole United States.