

## **Assessing the impact of Land-Use and Land-Cover Change on the Greater Phoenix Area**

**Matei Georgescu**  
*Rutgers University*  
*New Brunswick, New Jersey*

The Greater Phoenix, Arizona, area, the southwestern U.S.'s largest metropolitan region outside of California, has undergone extensive modification to its native landscape, with natural shrubland being replaced by irrigated agriculture and a widespread urban area. High-resolution (2 km) numerical simulations using the Regional Atmospheric Modeling System (RAMS) were carried out for two different sets of land use/land cover characteristics: one based on a satellite-derived representation of Phoenix circa 1992, and the other a hypothetical "Pre-Settlement" land cover where the entire anthropogenic landscape (irrigated agriculture and urban pixels) was removed. For both sets, simulations were performed for three "wet" and three "dry" Julys, in order to better quantify the impact of changing landscape during diverse atmospheric settings. Results suggest that the presence of irrigated agriculture may have damped the warming caused by urbanization. Effects on precipitation are less clear, though a relatively more pronounced signal is present during the three "dry" North American Monsoon System seasons. Additional simulations conducted with satellite-based landscape reconstructions for mid-1970's and early 2000's Great Phoenix land use/land cover suggest that decreases in irrigated agriculture since the mid-1970s, together with continued urbanization, likely has resulted in a decrease in agriculturally-induced domain-wide cooling, with urban warming expected to dominate in the coming decades.