Increased Rainfall? Could Be An Urban Heat Island

(NAPSA)—The rain in Spain may fall mainly on the plain, but here in the United States and the rest of the world, it falls more in the cities. This was recently confirmed by NASA researchers, who have, for the first time used a rainfall-measuring satellite to confirm that "urban heat-islands" create more summer rain over and downwind of major cities, including Atlanta, Dallas, San Antonio and Nashville.

Dr. J. Marshall Shepherd and colleagues at NASA's Goddard Space Flight Center, Greenbelt, Md., found that urban areas with high concentrations of buildings, roads, and other artificial surfaces retain heat and lead to warmer surrounding temperatures, and create urban heat-islands. This increased heat may promote rising air and alter the weather around cities.

"Cities tend to be one to 10 degrees Fahrenheit warmer than surrounding suburbs and rural areas and the added heat can destabilize and change the way air circulates around cities," said Shepherd. Rising warm air may help produce clouds that result in more rainfall around urban areas.

Using the world's first space-based rain radar aboard NASA's Tropical Rainfall Measuring Mission (TRMM) satellite, Shepherd and colleagues found that mean monthly rainfall rates within 18 to 36 miles downwind of the cities were, on average, about 28 percent greater than the upwind region. In some cities, the downwind area exhibited increases as high as 51 percent.

Mostly during the warmer months, the added heat creates wind circulations and rising air

NASA has found that because high buildings and roads retain heat, which leads to warmer temperatures, the rain falls mainly in the city.

that can produce clouds or enhance existing ones. Under the right conditions, these clouds can evolve into rain-producers or storms. It is suspected that converging air due to city surfaces of varying heights like buildings, also promotes rising air needed to produce clouds and rainfall.

"A recent United Nations study estimates that 60 percent of the world's population will live in cities by 2025, so a better understanding of the impact of urban land use change on Earth's water cycle system is vital," Shepherd said.

By showing how space-borne platforms can be used to identify rainfall changes linked to cities and urban sprawl, the research may help land managers and engineers design better drainage systems, plan land-use, and identify the best areas for agriculture.

The study was funded by TRMM Project Science Office and NASA Headquarters. TRMM is part of NASA's Earth Science Enterprise. For more information visit http://earthobservatory.nasa.gov.