# Human activities can affect rainfall

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U.S. researchers say they've determined human activities in arid urban environments can affect the rainfall and water cycle.

While scientists have known for some time the so-called "heat-island" effect of large cities can affect weather, they knew less about that effect and other processes in arid cities, such as Phoenix, that have experienced explosive population growth.

Now, a study by Marshall Shepherd, a climatologist at the University of Georgia, has shown -- using a unique 108-year-old data record and NASA's Tropical Rainfall Measuring Mission satellite -- arid cities such as Riyadh in Saudi Arabia and Phoenix have an effect on rainfall patterns around them.

The study showed a 2-percent increase in rainfall in Phoenix, but researchers said that could be an anomaly.

As important, it appears human activities such as land use, aerosols and irrigation in these arid urban environments affect the entire water cycle as well.

"Many of the fastest-growing urban areas are in arid regimes," said Shepherd. "Because their total rainfall is low, these areas have been largely ignored in studies on how human activities affect the water cycle. But these cities are particularly sensitive to such changes, since the water supply is so critical."

The research appears in the online edition of the Journal of Arid Environments.