

Tropical storms endure over wet land, fizzle over dry

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(PhysOrg.com) -- If it has already rained, it's going to continue to pour, according to a Purdue University study of how ocean-origin storms behave when they come ashore.

More than 30 years of monsoon data from India showed that ground moisture where the storms make [landfall](#) is a major indicator of what the [storm](#) will do from there. If the ground is wet, the storm is likely to sustain, while dry conditions should calm the storm.

"Once a storm comes overland, it was unclear whether it would stall, accelerate or fizzle out," said Dev Niyogi, Indiana state climatologist and associate professor of agronomy and earth and atmospheric sciences.

"We found that whether a storm becomes more intense or causes heavy rains could depend on the land conditions - something we'd not considered. Thus far we've looked at these storms based mainly on ocean conditions or [upper atmosphere](#)."

Niyogi said tropical storms gain their strength from warm ocean water evaporation.

"The same phenomenon - the evaporation from the [ocean](#) that sustains the storms - could be the same phenomenon that sustains that storm over land with moisture in the soil," he said. "The storm will have more moisture and energy available over wet soil than dry."

Niyogi's team's findings were published in the August edition of the

journal *Geophysical Research Letters*.

Storm data fed into a model showed that higher levels of ground moisture would sustain Indian monsoon depressions. The model's prediction was proven when compared to ground conditions for 125 Indian monsoons over 33 years, where storms sustained when the ground was wet at landfall.

Knowing the sustainability of a storm could lead to better predictions on flooding and damage inland before a monsoon or a hurricane makes landfall.

"We think the physics is such that we could see similar results more broadly, such as in the United States," Niyogi said.

The National Science Foundation and NASA funded the research. The Purdue led-team also consisted of researchers from the National Center for Atmospheric Research, NASA-GSFC/ESSIC, the University of Georgia, the Indian Space Research Organization and the Indian Institute of Technology Delhi.

Niyogi said the next step is to use the model and ground moisture data to test these theories for hurricanes in the United States.

[More information:](#) Possible Relation Between Land Surface Feedback and the Post-landfall Structure of Monsoon Depressions, [Geophysical Research Letters](#).

Source: Purdue University ([news](#) : [web](#))

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