

Study details links between climate, groundwater availability - will help states prepare for drought

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Everyone knows that climate affects our water supply, but new research from North Carolina State University gives scientists and water-resource managers an unprecedented level of detail on how climate and precipitation influence groundwater and surface water levels in the Southeast.

Researchers found that the groundwater, primarily from unconfined aquifers, available in any given month is directly influenced by the amount of [precipitation](#) that fell in that watershed three months earlier. For example, groundwater levels in April are affected by precipitation that fell in January.

Similarly, streamflow – the amount of water in rivers, streams and other surface waters – is influenced by overall groundwater levels over the previous three months combined. So streamflow in April is influenced by [groundwater levels](#) in January, February and March.

"This is the first time we've had this specific understanding of how [climate](#) and precipitation influence groundwater and streamflow in the Southeast," says Dr. Sankar Arumugam, co-author of a paper describing the study and an associate professor of civil, construction and environmental engineering at NC State. The researchers looked at the Southeast region of the United States, stretching from Virginia to Florida and westward to include Alabama.

"Our findings give water-resource managers significantly more information they can use to make planning and policy decisions to better prepare for water shortages or drought by developing management plans that account for both streamflow and groundwater," Arumugam says.

The researchers evaluated 20 to 30 years of data from 20 watersheds throughout the Southeast, as well as climate data from the El Nino Southern Oscillation – which denotes hot (El Nino) or cold (La Nina) sea-surface temperature conditions in the tropical Pacific.

More information: The paper, "Role of Climate Variability in Modulating the Surface Water and Groundwater interaction over the Southeast United States," is available online from the *Journal of Hydrologic Engineering*.

Provided by North Carolina State University

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