



## **Hydrologic response of hillslope seeps and headwater streams of the Fort Worth Prairie**

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There has been minimal research on the relationships among vegetation, topography, and hydrology of hillslope seeps and headwater streams in general, and in the Fort Worth Prairie ecoregion in particular. Unlike traditional descriptions of Midwestern tallgrass prairies, these riparian zones are often dominated by annuals. Due to the ephemeral or intermittent nature of headwater stream hydrology, the high variation of soil moisture restricts tallgrasses from dominating riparian zones. In this study we quantify the hydrologic regime of a Fort Worth Prairie hillslope hollow by analyzing the spatio-temporal response of soil moisture to precipitation and drying, its impact on runoff generation, and the vegetation-soil moisture relationship. We conducted the study between August 2012 to March 2013, under drought-like conditions that prevented streamflow. Results show that, despite extreme moisture stress, the hillslope seep completely saturates during wet periods and saturates along the hillslope base during dry conditions. Autumn vegetation most accurately aligns with moderate soil moisture conditions. This research describes Fort Worth Prairie headwater stream and seep habitats and provides a basis for how they function hydrologically to create a foundation for improved habitat management, protection, and restoration of riparian headwaters in North Central Texas.