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# Assessing the hydrological changes due to land use alterations

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The increase of urbanized areas and, consequently, of the impervious surfaces in land-use distributions may have important implications on the basin hydrological response. As a direct impact, the increase of cemented areas reduces the available storage volume for water in the watershed, which in turn exacerbates the runoff generation. Additionally, drainage pathways can be altered and the travel time to the watershed outlet considerably speeded up, with impacts on the hydrograph characteristics. The complex interactions among different hydrological processes make the estimations of the hydrological changes highly non linear.

The aim of this work is using an advanced physically-based and distributed model, i.e. tRIBS (TIN-based real-time integrated basin simulator), to evaluate how the changes in the hydrological properties affect the watershed response not only in terms of outlet discharge but also in terms of spatial distribution of the main hydrological variables (e.g., soil moisture patterns, groundwater level, etc...).

Moreover, we evaluate whether and how the spatial pattern of the impervious areas increase affects the change in the hydrological response.
The work has been carried out on the Baron Fork watershed, located in OK (USA), characterized by an area of about 800 km2 and for which the tRIBS model was successfully calibrated in the past. Specifically, we evaluate the hydrological response for different extreme events typical of the area and different land-use configurations.