

## **Application of Watershed Modeling System for Urbanization Management in Tabuk Area, Saudi Arabia**

**Authors :** Abd-Alrahman Embaby, Ayman Abu Halawa, Medhat Ramadan

**Abstract :** The infiltrated water into the subsurface activates expansive soil in localized manner, leading to the differential heaving and destructive of the construction. The Watershed Modeling System (WMS) and Hydrologic Engineering Center (HEC-1) are used to delineate and identify the drainage system and basin morphometry in Tabuk area, where flash floods and accumulation of water may take place. Eight drainage basins effect on Tabuk city. Three of them are expected to be high. The flash floods and surface runoff behavior in these basins are important for any protection projects. It was found that the risky areas that contain Tabuk shale could be expanded when exposed to flash floods and/or surface runoff. The resident neighborhoods in the middle of Tabuk city and affected by surface runoff of the tributaries of the basin of Wadi Abu Nishayfah, Na'am and Atanah outlet, represent high-risk zones. These high-risk neighborhoods are Al Qadsiyah, Al Maseif, Arrwdah, Al Nakhil and Al Rajhi. It can be avoided new constructions on these districts. The low or very low-risk zones include the western and the eastern districts. The western side of the city is lying in the upstream of the small basin. It is suitable for a future urban extension. The direction of surface runoff flow or storm water drain discharge should be away from Tabuk city. The quicker the water can flow out, the better it is.

**Keywords :** digital elevation model (DEM), flash floods, Saudi Arabia, Tabuk City, watershed modeling system (WMS)

**Conference Title :** ICHMWM 2017 : International Conference on Hydro Models and Water Science

**Conference Location :** Jeddah, Saudi Arabia

**Conference Dates :** January 30-31, 2017