The Role of GIS and HECRAS Hydrologic Model in flood Inundation Mapping: A Case Study in Wadi Al Mjinin, Libya. (Oral)

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ABSTRACT

Flash flood resulting from an extreme event or dam failures lead to serve losses in lives and properties, the extent of losses is determined by the flood areas and the rainoff propagation, rainfall anomalies resulting from global climate change increases the risk of flood practically in arid and semi-arid regions. Thus, flood simulation is a crucial process in providing information on flood extents, characteristics, and help in mitigation strategies.

Wadi AL Mjinin dam is located south of the capital Tripoli, the Wadi has a path from the dam to the sea with distance of 70km, which make agricultural farms, villages, and the capital down town expose to flood risk.

This paper discussed the role of geographic information systems (GIS) techniques in understanding the geomorphology of the Wadi, and the risks of flash flooding in the region. 2D HECRAS model along with GIS models and satellite imagery processed in ArcGIS environment to generate flood inundation maps and flood risk maps in the extreme rainfall event.

The study has concluded that by using the our simulation's parameters, water surface and flood would reach the residential areas at the outlet of the Wadi path with flood submerge the areas to depths ranging from 3.6m to above 15m, the flood waters will continue to flow for about 19 hours to reach to Gasir Ben Gishir area, and waters will spread by more than 2.4 km from the Wadi path at areas including Twaisha, Ben gishir, and Salah eldin.

The study's findings and the final maps can be used to develop some solutions to reduce flood risks in the study area, such as the establishment of dam plans to reduce torrent flow, as well as the preparation of an urban plan for the area to avoid areas of rainwater flow and flash floods.

Keywords: Flood; GIS; Watershed; Digital Elevation Model (DEM).