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**Flood hazard maps generation caused by hypothetical failure
of the Tabqa Dam by use of HEC-RAS 2D model**

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ABSTRACT

One of the most devastating natural calamities is flooding. Time of occurrence, mode of spread, and magnitude are all crucial pieces of information to have. Catchments and regions are frequently reported to have been flooded, with tragic results including loss of life, destruction of property, suspension of traffic, loss of power, and suspension of community activities. The height of infrastructure like bridges and levees is based in part on the predicted flood water level; thus, its calculation is essential. The failure of dams occurs from several factors, including what is natural, such as heavy rains in excess of the capacity of the dam reservoir, violent earthquakes that strike the dam area, or a result of human action, such as explosions resulting from wars and defective maintenance of the dam's facilities. This leads to flooding on neighboring properties when water flows out of its channel. Decision-makers can use flood analysis to better foresee and prepare for floods. In this case study, a numerical model was constructed for the Euphrates River to predict how flood waves would flow via the river's channel and floodplains. It is based on a slightly altered version of the full Saint-Venant equations of unsteady flow. The hydrodynamic model was used to look into what would happen if Tabqa Dam failed and how it would affect the Euphrates River's peak flow, peak water level, lag time of peak flow, and lag time of peak water level along the river reach under study. This was done for different values of the Manning roughness coefficient of the floodplain. The study area spanned 575 km from Tabqa Dam to Haditha Dam along the Euphrates River. The HEC-RAS 6.4.1 model in two dimension was applied to the study area to simulate and produce maps showing the latitudinal spread of water, inundation areas, and wave arrival time over most of the major cities along the Euphrates River in the study area. The ability of Haditha Dam to drain the flood wave reaching the dam lake was also simulated.

Keywords: Flood wave; HEC-RAS 2D; Tabqa dam; Haditha dam
