



Numerical evaluation of routing of dam reservoir to discuss the flood plain

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Abstract

Flood is a complex natural disaster and destroying phenomenon that causes considerable annual damage. In addition, floodplain and lands alongside river beds are always in expose of flood hazards, while most of economic and social activities are conducted in these areas. Therefore, in these regions, flood zoning is necessary. In hydrology, routing is a technique used to predict the changes in shape of water as it moves through a river channel or a reservoir. In flood forecasting, hydrologists may want to know how a short burst of intense rain in an area upstream of a city will change as it reaches the city. Routing can be used to determine whether the pulse of rain reaches the city as a deluge or a trickle. Other uses of routing include reservoir and channel design, floodplain studies and watershed simulations. In this research, the map of flood zoning with different return periods for a part of Gorgan Rood River, Iran was provided. Hydrological data and information were collected and analyzed. Flood routing by using Muskingum-Cunge method in different reaches was conducted.

Key words: flood routing, hydrologic model, Iran

1. Introduction

Unsteady open channel flow modeling is important in flood routing and prediction, stream flow modeling, river regulation and in the analysis of estuarine flows. Flood routing is the activity of mathematically modeling the progress of a flood wave (or hydrograph) while it moves downstream. It is an integral component in any hydrologic model and is the most important activity in predicting flood stages and discharges as functions of time and space along a river reach. Flood routing is employed in practice for the solution of a wide variety of problems associated with water use. Some of these include:

predicting flood hydrographs for given or assumed initial conditions;

determining hydrographs modified by reservoir storage;

evaluating past floods for which records are incomplete;

Studying the effects of water resources development on the downstream flow conditions Flood routing is used in predicting the characteristics of a flood wave and their change with time in the direction of flow. These characteristics include:

maximum water surface elevation and its rate of rise or fall (considered to be an important factor in the planning and design of structures across or along streams and rivers), peak discharge, which is required in the design of spillways, culverts, bridges and channels sections, and total volume of water resulting from a design flood to assist in the design of storage facilities for flood control, irrigation and water supply.