GEY715 Second Presentation

Monday Dec. 1

Amada Brandt

Development of Flood-Frequency Hydrographs Using the Curve Number and Muskingum Methods for the West Wendover Area, Elko County, Nevada

Peggy E Elliott

ON EVALUATING DENSITY DRIVEN GROUNDWATER FLOW IN THE CLOSED BASIN

Aron Habte

Abstract

The closed basin hydrologic and geochemical cycles in arid regions are subjected to the climate variability over a wide range of spatial and temporal scales, which directly link to the magnitude and frequency of severe regional flooding events. Improved understanding of such variability will help minimize the tremendous damages caused by extreme hydrologic events (e.g., floods) to human lives, economic activities and natural resources, and help manage water resources efficiently. The topographic and geologic data collected in the Pilot Valley, Utah are used to conceptualize the closed basin hydrologic domain. Saturated and Unsaturated Transport model (SUTRA) is then implemented in the Pilot Valley to simulate subsurface density-driven flow with rainfall-induced recharge at high mountain areas and discharge at the low valley playas. Historic meteorological records (i.e., precipitation, temperature, and solar radiation) and digital elevation data are compiled and analyzed for the hydrologic simulation with SUTRA. The Maxey-Eakin method, which shows the relationship function between elevation and precipitation, is applied and used for estimating the rainfall induced recharge to the groundwater. Numerical experiments are designed to examine how the heterogeneity in geologic formations (e.g., hydraulic conductivity and storativity) and the scaling variability in topography affect the flow system. The impact of climate variability (warm and wet trends) on the closed basin flow system is evaluated with the simulation.

"Ground water flow simulation with HST3D in the Yucca Mountain Region"

Feng Pan

"Simulating The Groundwater of Yucca Mountain Area by HST3D Model"

Liqiong Zhang

Wednesday Dec. 3

Significance of Boundary Conditions
Harrison Steed

Distributed Hydrologic Modeling
John Zimmerman

Modeling Impacts of Secondary Recharge on shallow groundwater using GIS Methods
Eric Dano

Significance of boundary conditions
Tesfaye Zewdu

Introduction

Application of large numerical models to groundwater problems involves both art and science. Successful modelers understand the science behind the models they are used and have considerable experience in applying models to practice problems (Applied groundwater modeling, 1992 edition). Mathematical model consists of a governing equation boundary conditions, and initial conditions. Boundary conditions are mathematical statements specifying the dependent variable (head) or the derivative of dependent variable (flux) at the boundaries of the problem domain. Correct selection of boundary conditions is critical step in mode design in steady-state simulation; the boundaries largely determine the flow pattern. Boundary conditions influence transient solutions when the effects of the transient stress reach the boundary. According to Frankee et.al. (1987), setting boundary conditions the step in model design that is the most subject to serious error. The significance of boundary conditions in groundwater modeling very great. In our project condition we are using different boundary conditions. Here there is a simple flow system and we can distinguish how each set of boundary conditions affects the simulated heads and fluxes in the model.

References: 1. Applied ground water modeling, 1992 edition
2. Notes from Dr. Yu, Gey-715, final project homework no.4

"MODFLOW 2000, The Geological Survey Modular groundwater model"
John Criscione