

Updating the Groundwater Flow Model for the Southern Jornada Del Muerto Basin - Implementing Reviewers' Comments

B V N P Kambhammettu and J. Phillip King (advisor)
Civil Engineering, New Mexico State University

Purpose of Study

The purpose of the study is to update the southern Jornada Del Muerto flow model that was originally developed as a part of lower Rio Grande Water Users Organization (LRGWUO) regional water plan in order to better mimic the actual field conditions. The original report on Jornada flow model was reviewed by expert members from different departments across the state, and their comments will be accordingly implemented in the present research.

The estimation of mountain front recharge is to be revised by identifying groundwater divide, and delineating the upfront areas beyond the model boundary using ArchHydro tool. Three empirical estimates for recharge will be evaluated using residual statistical parameters, and the best method of recharge estimate will be selected before implementing into the model.

Layer elevations, and initial water table elevations are to be hand contoured in order to account for the variability in topography on either side of surface faults, and divides. Since geostatistical interpolation techniques (that ignores the presence of geological faults and divides) cannot predict the surface accurately, hand drawn contours will be used in this research.

Pumping from municipal wells in the southern part of the study area used in the report were slightly higher compared to literature. Pumping from a few wells have to be adjusted to match with historic records, and the model has to be re-evaluated to reflect the changed scenarios.

Benefits of the Study

The revised Jornada model with the implementation of the major comments, can be used for simulating the effect of municipal pumping and other stress components within the basin. Simulation results will be presented in terms of piezometric heads, and budget flows for selective stress periods. The model can then be integrated with the Rincon-Mesilla (OSE-2007) flow model to form a unified groundwater flow model encompassing the entire LRG administrative region. The effect of municipal withdrawals on Rio Grande depletions, inter-basin flows, and changes in storage can be evaluated from the present research. The revised report, along with MODFLOW input files, and other input data will be submitted to NM WRRRI for publication in the form of a technical report.



Phani graduated from the Indian Institute of Technology, Kanpur, India in 2002. From there, he worked as lecturer and assistant professor of civil engineering at GVP College of Engineering in India. In 2007, Phani began pursuing a Ph.D. in civil engineering with a minor in GIS at NMSU. Phani also works at WRRRI as a GIS and water resources specialist. He is currently working on the transboundary project of the Lower Rio Grande basin.

