

7-25-2007

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Abstracts of the presentations given on Wednesday, 25 July 2007, in Session 16 of the UCOWR Conference.

Recommended Citation

Sheng, Zhuping; Herrera, Estrella; and Michelsen, Ari, "Conceptual Model for Flood Control Planning in the Lower El Paso Valley" (2007). 2007. Paper 19.

http://opensiuc.lib.siu.edu/ucowrconfs_2007/19

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Conceptual Model for Flood Control Planning in the Lower El Paso Valley

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ABSTRACT

The Rio Grande channel below El Paso has been modified due to failure of Riverside Dam and changes in irrigation delivery network. In addition, lack of maintenance of river system has posed a great threat for flood hazard. To have a better understanding of the river system and develop a tool for flood control planning, the authors have been developing a conceptual model. In this paper, the authors present a conceptual model for flood control planning in the Lower El Paso Valley. In the model, the river, canals and laterals and drains as well as underlying shallow groundwater aquifer are considered as integrated components. RiverWare was used to simulate the river flow. Return flows of drains and gains/losses of the river were estimated using time series transfer functions. Historic flow data was used to calibrate the numerical model. The river flow greatly depends on upper stream delivery and run-offs. Several flooding scenarios were evaluated under different delivery options. Preliminary results show that the worst case scenario is to have the canal delivering at its full capacity while additional ordered water is released from the upper stream reservoir plus run-offs collected along the way before reaching El Paso. Even though the capacity of irrigation network is limited for release of flood flow, it is possible to use it to reduce flood damages if it is well planned and operated with a good flow monitoring system. The conceptual model and results provide guidelines for future maintenance of the river system and flood control planning that will reduce flood damages.

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