Development of RiverWare models of the Rio Grande flow for flood control and water operations planning

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Project Team

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- UACJ – A. Granados and Víctor Esquivel-Ceballos
- Conrad G. Keyes, Jr., Consultant
RiverWare Model for Rincon Valley and Mesilla Basin (NMSU & TAMU)

- Surface water diversions linked to cropped area demand
- Interactive groundwater objects linked to drain return flows
- Expand the RiverWare model to represent the main canal system
- Simulate river flow and water operations planning scenarios
- Enhance coordinated water resources database
SOW - LRG

RiverWare Model for Lower El Paso Valley
(TAMU and UACJ)

- Compile flow and crop data
- Develop the RiverWare™ model to simulate the river flow and water operations planning scenarios
- Incorporate data into the coordinated water resources database
- Evaluate USGS MODFLOW model for Hueco Bolson for SW/GW interaction
RiverWare Daily Model – River & Irrigation Network

- Daily time step
- Include river reaches, canals, and drains
- Rincon and Mesilla Basin – Groundwater-Surface Interactions using groundwater objects link MODFLOW and RiverWare
- Expand the RiverWare model into El Paso-Juarez valley
Rincon Valley Model
Rincon Valley RiverWare Layout
Rio Grande above Leasburg
Rio Grande above Leasburg

\[ y = 0.9032x - 57.482 \]
\[ R^2 = 0.9492 \]
Mesilla Basin Model
Flow of Rio Grande at El Paso
Rio Grande at El Paso

\[ y = 0.6624x + 331.73 \]
\[ R^2 = 0.703 \]
El Paso – Juarez Valley Model
El Paso – Juarez Valley
El Paso – Juarez Valley Conceptual Model
El Paso – Juarez Valley
Conceptual Model
El Paso – Juarez Valley RiverWare Objects
Rule set


Hudspeth Feeder Rule

IF ( Hudspeth Diversion Sent () ) THEN
  IF ( All Fabens Drain Water Sent () ) THEN
    Hudspeth Feeder.Outflow["t+4"] = Fabens Waste Way 5.Inflow["t+4"]
  ELSE
    Hudspeth Feeder.Outflow["t+4"] = Hudspeth Feeder Confluence.Outflow["t+4"]
  ENDIF
ELSE
  Hudspeth Feeder.Outflow["t+4"] = 0.00000000 "cms"
ENDIF
American Canal
American Canal
Franklin Canal
Franklin Canal

![Graph showing a scatter plot with a trend line and equation]

\[ y = 0.6606x + 45.209 \]

\[ R^2 = 0.4352 \]
Rio Grande at Fort Quitman
Recommendation for Future Work

- Enhancement of DB & GIS
- Enhancement of the RiverWare models
- Integration of models for the Rio Grande Project area
- Incorporate operations rules into the model
- Evaluation of different operations planning scenarios
Thank You!

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