Groundwater Availability Modeling

Texas Water Development Board
Groundwater Availability Model (GAM) for the Southern Texas Gulf Coast

Presentation to the Kenedy County GCD
May 15, 2006
Rima Petrossian
How do we use GAM?

• The model
  – predict water levels and flows in response to pumping and drought
  – effects of well fields

• Data Storehouse
  – water in storage
  – recharge estimates
  – hydraulic properties
  – geologic structure
Groundwater Modeling

• We model the aquifer by dissecting or dividing it into blocks.
• Each block is called a “grid cell”.
• Water flowing in and out of each grid cell is calculated and balanced by the computer.
• Inflows and outflows can include:
  – cross formational flow (up and down flows),
  – lateral inflow and outflow (side to side),
  – pumping (water taken out of aquifer),
  – recharge (water being added to aquifer),
  – evapotranspiration, and
  – stream inflows and outflows.
Cutout of aquifer dissected into grid cells

From, Daniel B. Stephens & Associates, Inc.
Flow in one grid cell

- Permeability
- Storage
- Thickness

From, Daniel B. Stephens & Associates, Inc.
Problem Statement

The Central Gulf Coast GAM and the Lower Rio Grande Valley GAM have an overlap of ~5 miles creating a double accounting in the water budgets.
Map of Kenedy County with GAM Overlap Area

Each dot is the center Of a one square mile grid cell
Modeling Solution

- Evaluate the overlap and determine the distance
- Divide the distance by two
- Run each model without ½ of the grid cells in the overlap zone for the 1980-1999 period
- Compute the average value for the twenty year period
Map of Kenedy County with Overlap Removed

Each dot is the center Of a one square mile grid cell

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### Table Showing Change in the Water Budget in the Central Gulf Coast GAM without the Overlap Cells

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Table Showing Change in the Water Budget in the Lower Rio Grande GAM without the Overlap Cells

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Comments:

Rima Petrossian
rima.petrossian@twdb.state.tx.us
(512)936-2420
www.twdb.state.tx.us/gam