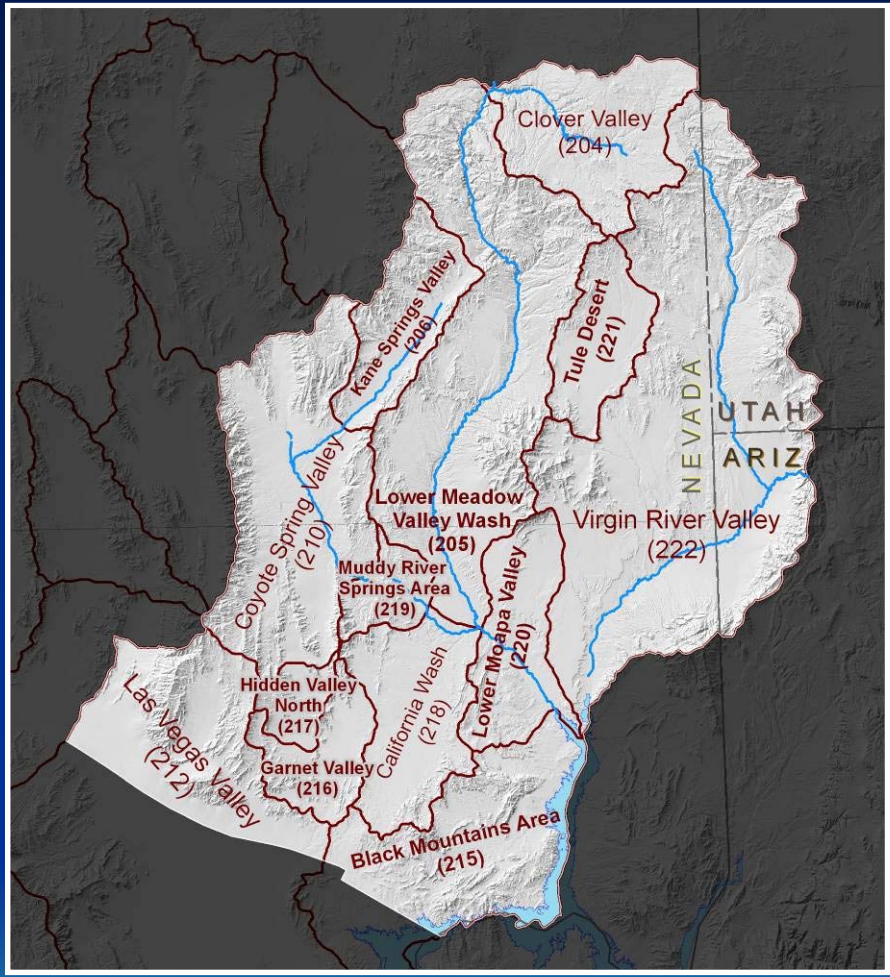
Development of a Hydrogeologic Model of a Part of the Colorado Regional Ground-Water Flow System

Model Objective

- To develop a calibrated numerical groundwater flow model to be used as a water-resources management tool for predicting the effects of future water use on groundwater resources in Southeastern Nevada.

Model Domain

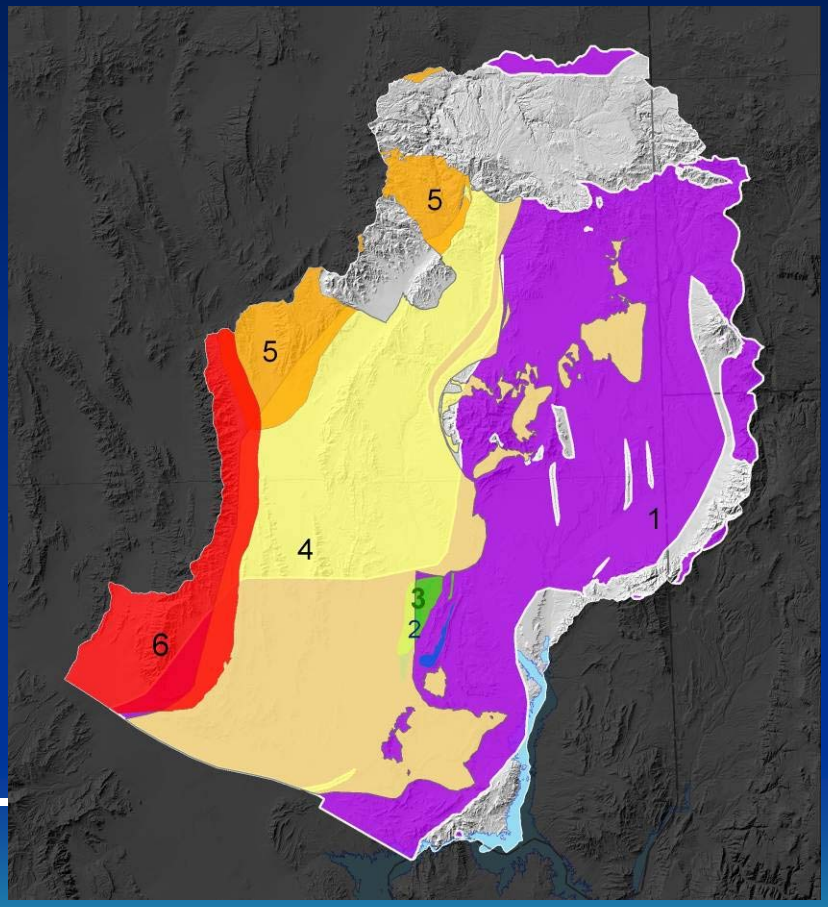
- Hydrographic Basins - 204, 205, 206, 210, 212, 215, 216, 217, 218, 219, 220, 221, and 222
- Portions of Clark and Lincoln Co, NV; Mohave Co, AZ; and Washington Co, UT
- Approximately 5,700 sq mi in area



Geologic Model – Numerical Approach

11 Geologic Units repeated by Basin Structural Features:

- Gass Peak Thrust
- Delamar Thrust
- Muddy Mountain / Glendale / Tule Springs / Mormon Mountain Thrust
- Summit-Willow Tank Thrust

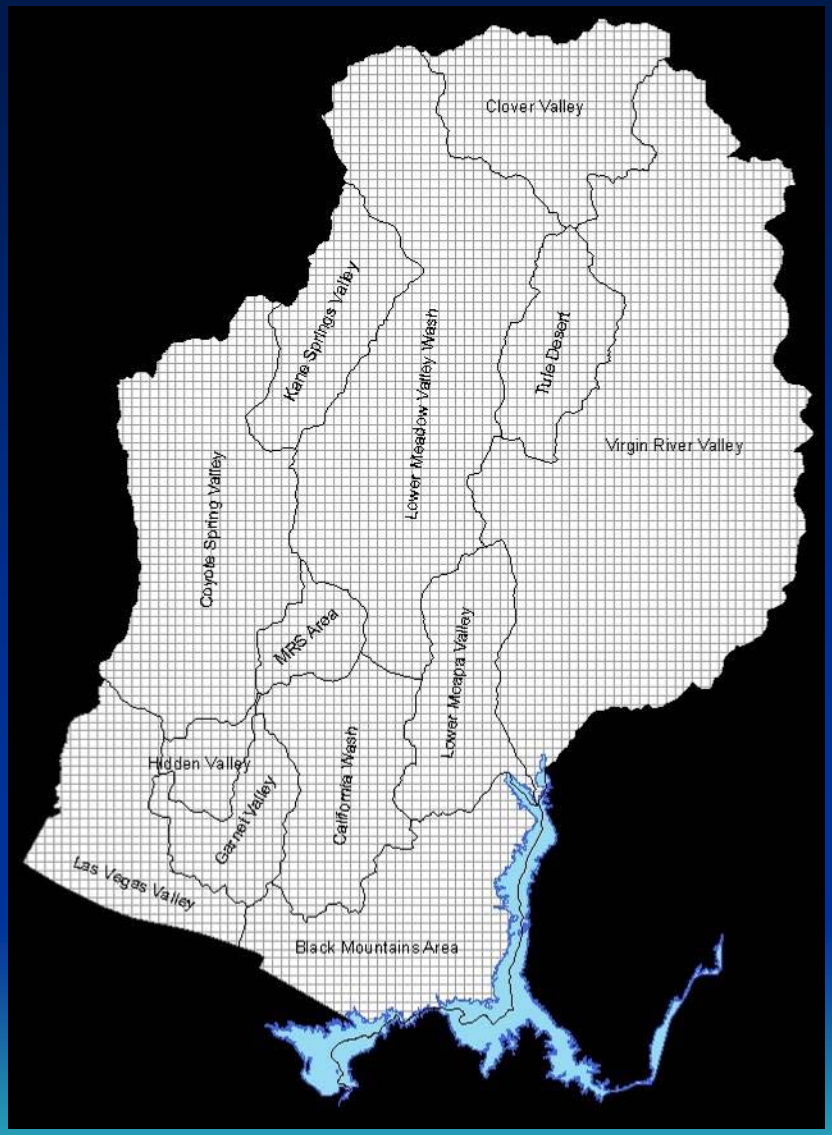


6 Thrust Sheets

27 HSUs

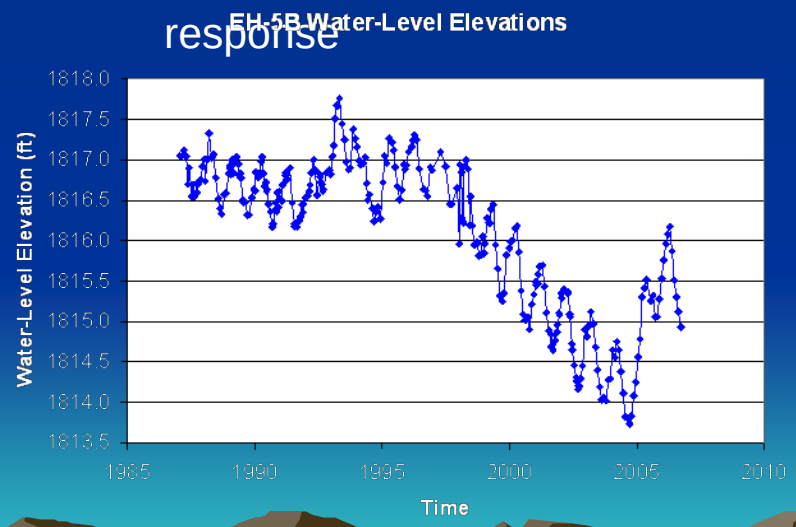
Modeling Approach

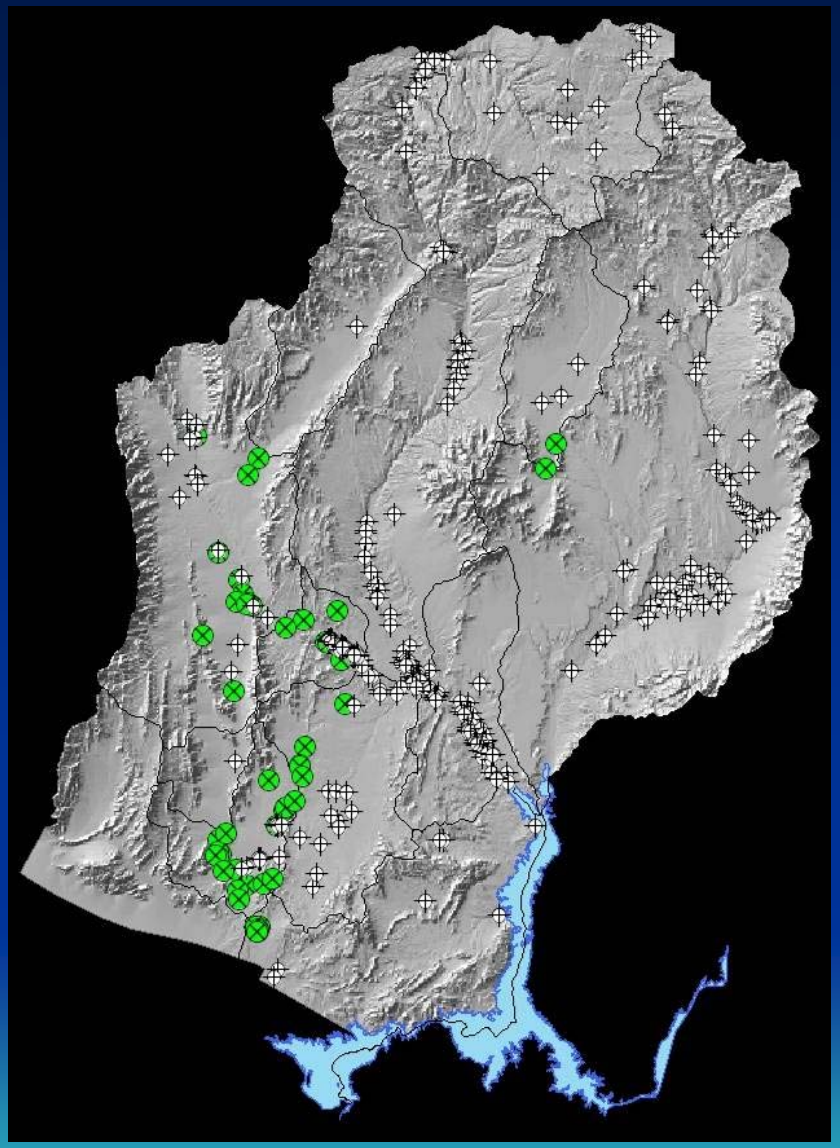
- MODFLOW 2005 and PEST
- Hydrologic Unit Flow (HUF) package
  - 27 hydrostratigraphic units including 6 stratigraphic units repeated by faulting
  - 20 model layers
- Lateral discretization
  - 1500 m x 1500 m, aligned with DVRFS grid



Calibration

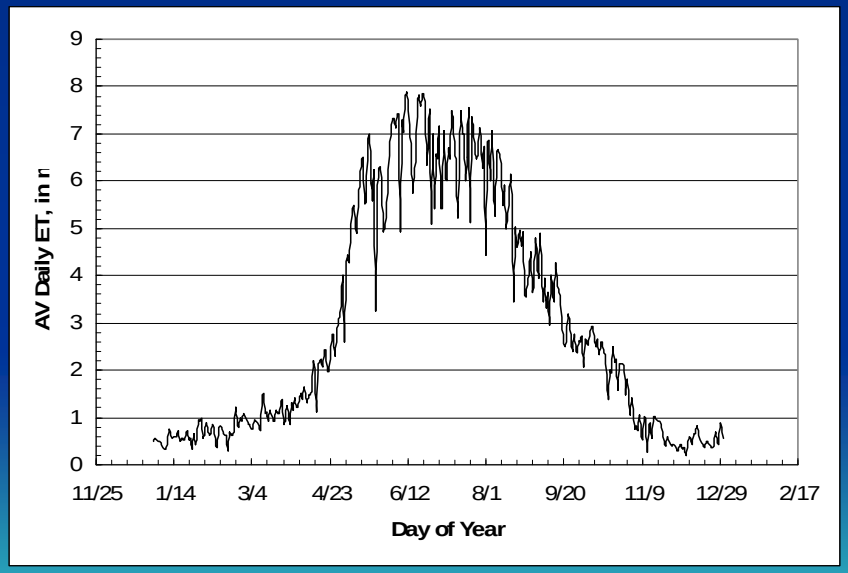
- Prepumping Conditions
  - Match regional water levels and water budget estimates
- Transient Conditions
  - ET and MRS/CSV pumping (drivers)
  - Water level and stream flow response

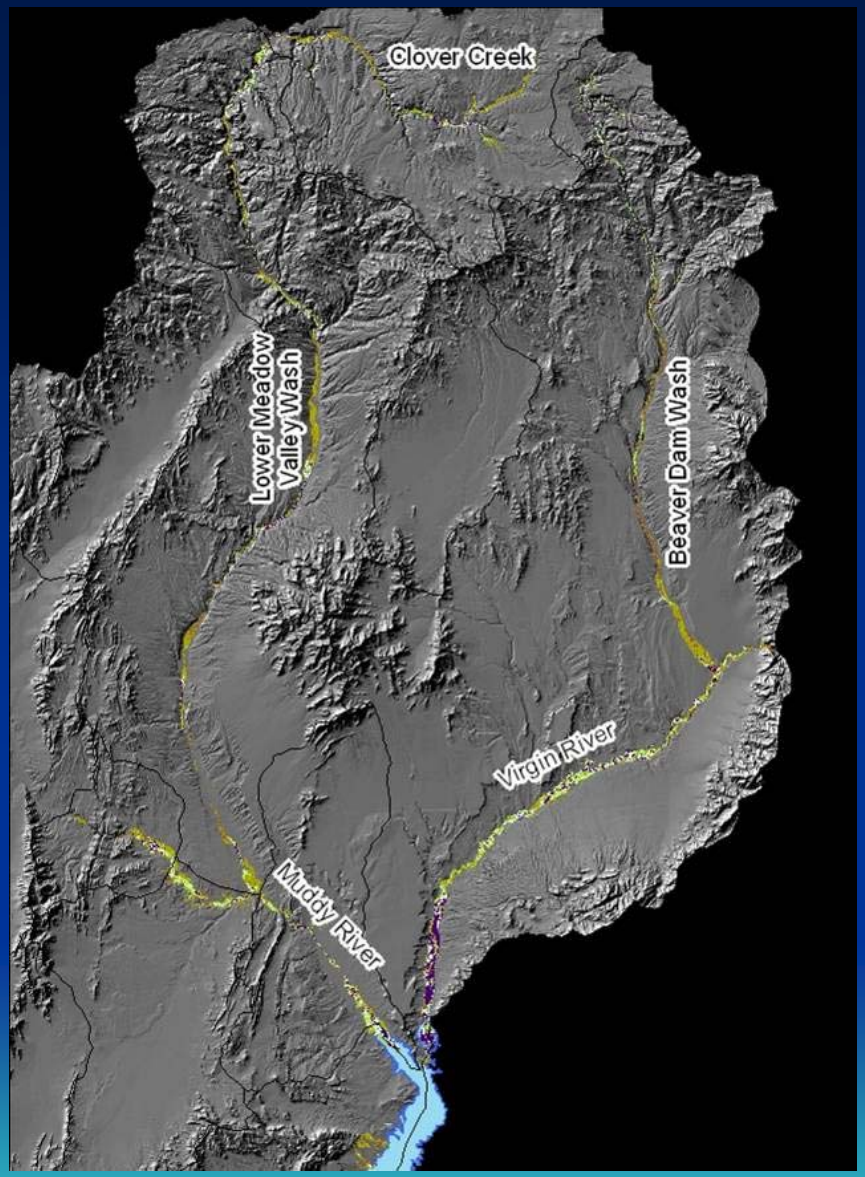




Evapotranspiration

- Use ET data collected by USGS (2008)
- Typically located near streams
- Driving function in model (WEL)
  - Muddy River Site





Status

- Framework model completed
- Pre-pumping and Transient calibration steps are proceeding separately
- Combined calibration anticipated to begin February 2009
- Calibration should be complete March 2009