Civil Engineering

Title: Groundwater Particle Transport at Ball Ranch

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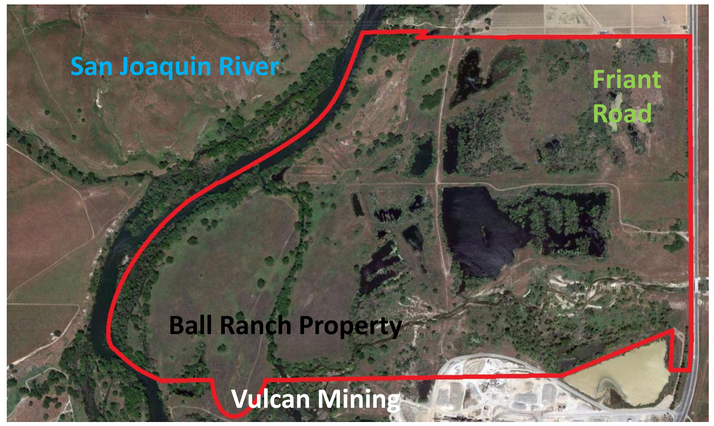
Abstract

- This project for Contaminant Transport and Fate in the Environment will take real world data and simulate a number of hypothetical contaminant situations that might occur on Ball Ranch.
- This simulation will be carried out using measured groundwater data and the modeling software Groundwater Vistas
- Groundwater Vistas will be used to analyze the transient data into a predictive model over a 4 month time span.

Location



Timeline

Spring Semester 2012

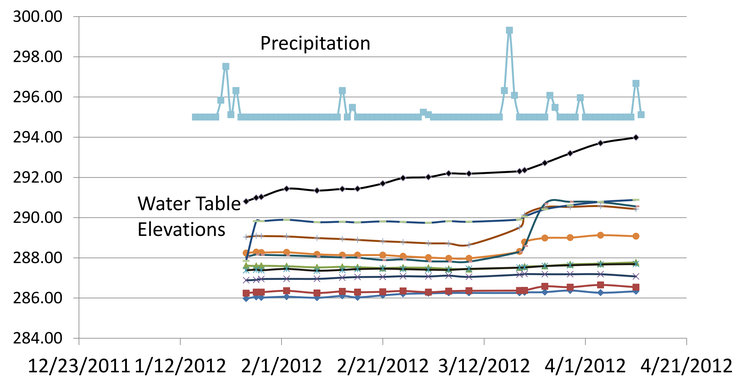
- Data collection period took place January 20th, 2012 – April 10th, 2012
- Modeling will simulate this window of data collection
- Model design time will run April 10th – April 20th

Data Collection

- California Data Exchange (CDEC)
  - San Joaquin River stage and flow
  - Precipitation data
- The California Irrigation Management Information System (CIMIS)
  - Evapotranspiration
- Direct monitoring well readings
  - Ten piezometers located at the Ball Ranch site

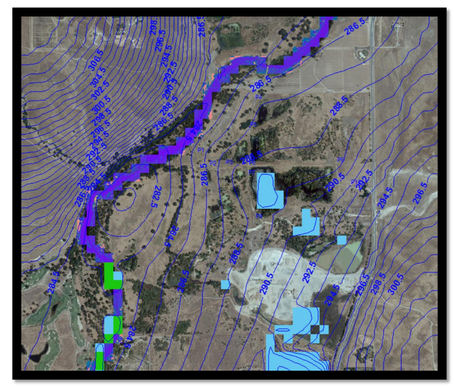
Data Analysis

- Precipitation and piezometer hydrograph data



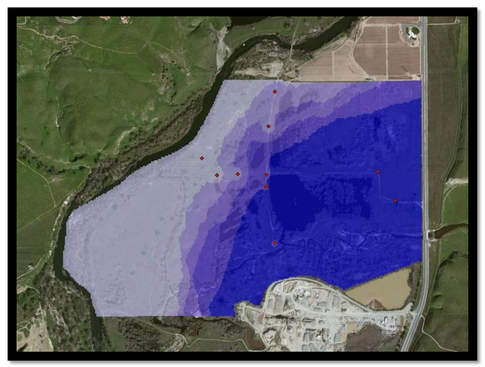
Modeling

- Model created using Groundwater Vistas v6
- Transient model based on 88 daily step periods



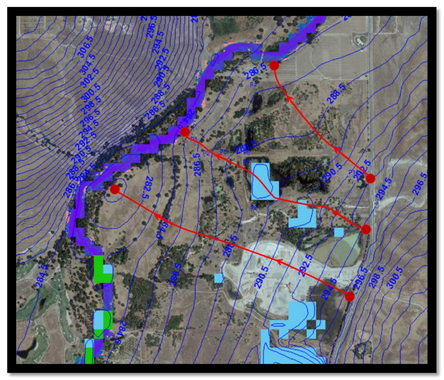
Modeling

- Surface models created in ArcGIS help to show the gradient of groundwater flow
- These surface maps were created for each data collection period



Results

- Each of these red lines represents a particle's path through the groundwater of Ball Ranch



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