Groundwater Model Development for the Wood River Valley

Presented by Sean Vincent, P.G.
March 19, 2013
Talking Points

• Why do we need a model?
• What is the scope of work?
• Who will do it?
• How long will it take?
• Who pays for it?
• Transparency
Not Talking Points

• Looming water crisis

• Water rights administration

• Water District expansion/creation

• Filling out NCAA tournament brackets
Why a groundwater flow model?

• Big Wood River upstream from Magic Reservoir fully appropriated (1980)

• Groundwater and surface water are hydraulically connected (1991)

• Need to be able to evaluate gw/sw interaction

• GW flow model is tool of choice for planning, water resource management, and conjunctive administration
Pre-modeling activities

• Sponsored 4 new USGS gages in 2010 (North Fork, East Fork, Trail Creek, Warm Springs)

• Expanded IDWR monitoring well network

• Developed and began executing work plan w/ budget and schedule
What is the project scope?

- Task 1 - Additional data collection
  - Water level synoptic in October 2012 = snapshot of aquifer
  - Seepage surveys in August 2012, October 2012, and April 2013

- Task 2 – Fact sheet preparation and publication
  - Summarizes current understanding of groundwater/surface water interaction
  - Describes IDWR/USGS collaborative modeling project
What is the scope of work? (cont’d)

- Task 3 – Construct a numerical groundwater flow model
  - Task 3.1 – Compile and update existing data
    - New water level, pumping, and reach gain data
  - Task 3.2 – Construct & calibrate a steady state model
    - Update aquifer water budget
    - Discretize model (cut up model area into small pieces)
    - Parameterize (assign hydraulic properties to the pieces)
    - Calibrate (adjust parameters until simulated and observed flows/water levels match)
  - Task 3.3 – Convert SS to transient/time-dependent model
  - Task 3.4 – Apply model for evaluation of scenarios
Big Wood River @ Glendale Bridge (8/2/2012)

View looking upstream

View looking downstream
What is the scope of work? (cont’d)

• Task 4 – Prepare report summarizing model construction and results
  – Publish as USGS Scientific Investigation Report and release model to public
Who will do the work?

- Collaboration between IDWR and USGS
  - USGS has recent work history in Wood River Valley
  - USGS is neutral party w/ expertise/experience
  - IDWR involvement allows customization of tool for IDWR and IWRB uses
  - USGS and IDWR have history of successful collaboration (e.g., SVRP model)
Ground-Water Flow Model for the Spokane Valley-Rathdrum Prairie Aquifer, Spokane County, Washington, and Bonner and Kootenai Counties, Idaho
Who will do the work? (cont’d)

• USGS primarily responsible for model construction and report preparation
  – Jim Bartolino, Ph.D. = lead investigator
  – Jason Fisher, Ph.D. = lead modeler

• IDWR will perform GIS work and lead calibration effort using PEST software
  – Mike McVay, P.E, P.G., Jennifer Sukow, P.E., P.G. and Allan Wylie, P.G., Ph.D. = modelers
  – Helen Harrington, P.G. and Neeley Miller = project coordination, public outreach, planning
When will it happen?

• Project is funded and underway

• Timing excellent because USGS has laid the groundwork for model development
  – Water Budget report in 2009
  – Hydrogeologic Framework report in 2012
  – IDWR thanks USGS and USGS cooperators

• Model rollout scheduled for late 2015 (end date constrained by budget)
Who pays for it?

- State of Idaho financing from Aquifer Planning and Management Fund
- USGS federal matching funds
- IDWR labor costs from operating budget
Transparency

- Public domain model and software (MODFLOW)
- Documentation
  - USGS scientific report, design objectives document, meeting summaries, etc.
- IDWR website to disseminate data, documents, model files, etc.
- Semi-annual public meetings
- Modeling Technical Advisory Committee (MTAC)
Who will do it? (cont'd)

MODELER
BEHIND THE CURTAIN

MODELER
BEHIND THE CURTAIN
Modeling Technical Advisory Committee (MTAC)

- Forum for data sharing and discussion of modeling methodology
- Provides for transparency and is vehicle for technical stakeholder input
  - Technical experts (e.g., hydrogeologists, hydrologists, water managers, and modelers)
- Voluntary membership
  - Encourage representation from interested parties (e.g., USGS cooperating organizations, municipalities, private industry, water user entities, agencies)
- Bi-monthly meetings
  - 1st meeting is April 11 in Conference Room 200 @ Community Campus in Hailey
Further Information

Wood River Valley Groundwater Modeling Project ➔

http://www.idwr.idaho.gov/WaterInformation/Projects/woodriver/

Sean Vincent, IDWR
sean.vincent@idwr.idaho.gov
208-287-4853