Model Calibration Update

Stephen Hundt
Discussion Points
How Close (or Far) are We?
- How far are we from a model that meets (or can be adapted to meet) the objectives of this project
- Are there areas that need to be improved?
- Are there types of observation targets that need to be improved?
- Are there specific observation locations that need to be improved?
- Do parameter distributions need to change?
- Is this malleable for further purposes?

What do you want to see in emailed updates over next few months?
- Plot types
- Tables
- Specific results (such as your favorite well)
- Frequency
Keeping in mind...

One Observation ↔ Another Observation
(multi-objective model is a compromise)

Model Fit ↔ ‘Agreeable’ Parameters
(avoid overfitting)

Model Fit ↔ Model Clarity
(keep it usable)

Improving Fit ↔ Documenting Model
Jumping Right In…
<table>
<thead>
<tr>
<th>Observation Type</th>
<th>Weighting Schemes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Levels</td>
<td>Measurement error</td>
</tr>
<tr>
<td>Drain Flows</td>
<td>~ Equalize group phi</td>
</tr>
<tr>
<td>Lowell Seepage</td>
<td># Measurements at location</td>
</tr>
<tr>
<td>River Seepage</td>
<td>Spatial density</td>
</tr>
<tr>
<td>Temporal Differences</td>
<td>Temporal density</td>
</tr>
<tr>
<td>Vertical Water Level Differences</td>
<td>“Events”</td>
</tr>
<tr>
<td>Net Water Budget Values*</td>
<td>Structural error</td>
</tr>
<tr>
<td>Preferred Parameters (simplified)</td>
<td>Overall budget</td>
</tr>
<tr>
<td></td>
<td>Others???)</td>
</tr>
</tbody>
</table>
### Model Parameters

#### Hydraulic Parameters

- **Hydraulic Conductivity – horizontal**
  - Grid: 1 every 5-10 cells * # layers
  - ~50 parameters, easily to 400+

- **Hydraulic Conductivity – vertical**
  - Grid: 1 every 5-10 cells * # layers
  - ~50 parameters, easily to 400+

- **Storage Coefficient**
  - Grid: 1 every 5-10 cells * # layers
  - ~50 parameters, easily to 400+

- **River conductance**
  - Gaged river reaches
  - 2 parameters, to gaged reaches

- **Drain conductance**
  - Gaged drain --
  - ~5 parameters, 18

- **Lowell conductance**
  - Lake
  - 1 parameter

- **NY Canal leakage factor**
  - Canal
  - 1 parameter

- **NY Canal leakage distribution**
  - Canal
  - 1 parameter

- **Canal leakage factor**
  - Irrigation entity
  - 1 parameter, 70

- **Canal leakage distribution factor**
  - Irrigation entity
  - 1 parameter, 70

- **Irrigated lands infiltration factor**
  - Irrigation entity
  - 1 parameter, 70

- **Semi-irrigated infiltration factor**
  - Irrigation entity
  - 1 parameter, 70

- **Tributary underflow multiplier**
  - 3 values
  - 3

- **ET multiplier**
  - 1 value
  - 1

#### Lumped Hydraulic(ish) Parameters

- **Leakage Estimation Parameters**

#### Irrigation Parameters:

- **Leakage and infiltration estimation**
Layer 1
green: upward component
purple: downward component
Observation id: ow0005
Observation name: idwr_other-lds_church_eagle_stake_well
Observation id: ow0024
Observation name: idwr-tv_bunch-kirkwood_well
Observation id: ow0025
Observation name: idwr-tv_camas_st_well
Observation id: ow0051
Observation name: idwr_other-04n_02e_29aca1
Observation id: ow0064
Observation name: idwr-tv_country_squire_well
Observation id: ow0143
Observation name: idwr-tv_n_blackcat_well
Observation id: ow0166
Observation name: idwr-tv_sabin_rd_well

![Map and graph depicting measured and modelled data, with iterations 1, 2, and 3, and residual values for each iteration.](image-url)
Observation id: ow0224
Observation name: idwr_other-03n_02e_14acb2
Observation id: ow0227
Observation name: idwr_other-01n_01e_19adb1
Observation id: ow0280
Observation name: idwr_other-01s_01w_30bab1
Observation id: ow0283
Observation name: idwr_other-01s_02w_14adad1
Observation id: ow0299
Observation name: idwr_other-02n_01e_15aba1
Observation id: ow0311
Observation name: idwr_other-02n_01w_08bbba1
Discussion
My Questions for You

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Thanks for listening!