The apparent ages and recharge temperatures (determined using \(^{3}H\)-\(^{3}He\) age-dating and noble gas thermometry, respectively) were determined for groundwater from valley, mountain-front, and headwater springs, and monitoring and production wells of varying depths to address the following questions:

- What is the source of groundwater discharging from the East Side Springs in Salt Lake City, UT?
- What can be said about the contribution of groundwater from the shallow groundwater system to the deeper aquifer in this area?

**INTERPRETIVE FRAMEWORK**

If groundwater from seeps, springs, and shallow wells is sourced from... We would expect to see...

<table>
<thead>
<tr>
<th>Mountain-block recharge</th>
<th>Old apparent ages, cold recharge temperatures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valley recharge</td>
<td>Young apparent ages (&lt; 22 years), warm recharge temperatures, urban-influenced chemistry (high chloride and nitrate concentrations)</td>
</tr>
<tr>
<td>A point (or line) source within the valley, such as Red Butte Creek</td>
<td>Age of groundwater increases with distance from source (piston-flow model)</td>
</tr>
<tr>
<td>A diffuse source within the valley, such as seepage of irrigation or precipitation</td>
<td>Age of groundwater increases with depth (exponential mixing model)</td>
</tr>
</tbody>
</table>

**RESULTS**

**Valley vs. mountain source**

- The seeps, springs, and shallow wells in this region primarily receive urban-influenced valley recharge as opposed to mountain-block recharge, as evidenced by their young apparent ages, high recharge temperatures, and relatively high chloride concentrations.
- A likely source of this water is losses from Red Butte Creek, as supported by the direct relationship between age and distance from Red Butte Creek and the hydraulic connection between Red Butte Creek and monitoring wells in the area.
- Deeper production and monitoring wells also have relatively high recharge temperatures and young apparent ages compared to production wells in the southern portion of the valley and display signals of urban-influence, including high chloride and nitrate concentrations, suggesting contribution of water from the shallow groundwater system.

**Contributions of Red Butte Creek**

- Young apparent ages (< 22 years), high recharge temperatures, and relatively high chloride concentrations are considered mountain-block recharge.

**Deeper groundwater system**

- The study area is influenced, including high chloride and nitrate concentrations, suggesting that groundwater transport can be described using an exponential mixing model. The vertical error bars on the samples collected from production wells represent the depths of the shallowest and deepest well screens.

**CONCLUSIONS**

I would like to acknowledge the CERCLA team at the VASLCHCS for allowing me to collect samples from the monitoring wells installed as part of their investigation. I would also like to thank Wil Mace and Jens Ammon for their help with sample collection and analysis, as well as my advisor Kip Solomon for his support throughout my master’s.