Combined Approaches for Quantifying Groundwater-Surface Water Exchanges in a Karst Watershed

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Background

Logan River Watershed

- Contains karst geology
Logan River Watershed

- Contains karst geology
  - Sinkholes
  - Caves
  - Conduits
- Everything else is the “matrix”
\[ \Delta Q = Q_{\text{downstream}} - Q_{\text{upstream}} - Q_{\text{tributaries}} \]
\[ \Delta Q = Q_{\text{downstream}} - Q_{\text{upstream}} - Q_{\text{tributaries}} \]

\[ \Delta Q = Q_{\text{karst}} + Q_{\text{matrix}} - Q_{\text{loss}} \]

\[ Q_{\text{karst}} + Q_{\text{matrix}} - Q_{\text{loss}} = Q_{C_{\text{downstream}}} - Q_{C_{\text{upstream}}} - Q_{C_{\text{tributaries}}} \]
Conclusion

- Logan Canyon is heavily influenced by karst geology
- Gains are largely due to karst features
- Losses occur throughout the watershed
- Low annual snowpack could lead to losses exceeding gains
Acknowledgements

Others involved in All-Hands Sampling:

Special thanks to Patrick Strong, Dave Epstien, Michelle Baker, Mitchell Rasmussen, and Tyler King

Funding:
• NSF EPSCoR grant IIA 1208732
• USGS 104(b) Grant
• Utah Water Research Laboratory, Utah State University
• Utah State University Undergraduate Research Fellows Program
• Utah State University Honors Program
• College of Engineering Undergraduate Research Program

References: