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

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Background

Logan River Watershed

- Contains karst geology
Background

Logan River Watershed

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

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

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