

# **Application of UCODE (an inverse model) to estimate hydrologic and storage zone parameters in a mountain stream**

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**Abstract.** Conservative solute tracer techniques have been used to establish hydrologic parameters of stream and hyporheic storage zones. OTIS, a one-dimensional solute transport model with storage and inflow, is one model used to evaluate conservative tracer experiments. Previously, modelers have employed visual trial and error and automated parameter estimation techniques such as STARPAC to estimate parameter values. In this study, inverse modeling was performed by coupling OTIS to UCODE, a computer code for universal inverse modeling. A dataset from a chloride injection experiment with data from 5 reaches was used to evaluate this approach to parameter estimation. Statistics calculated by UCODE were used to identify insensitive parameter values, to evaluate model fit, and to determine the importance of hyporheic exchange. This parameter estimation approach is extremely powerful in determining hydrological parameters within OTIS, and is highly recommended over visual trial and error techniques.

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