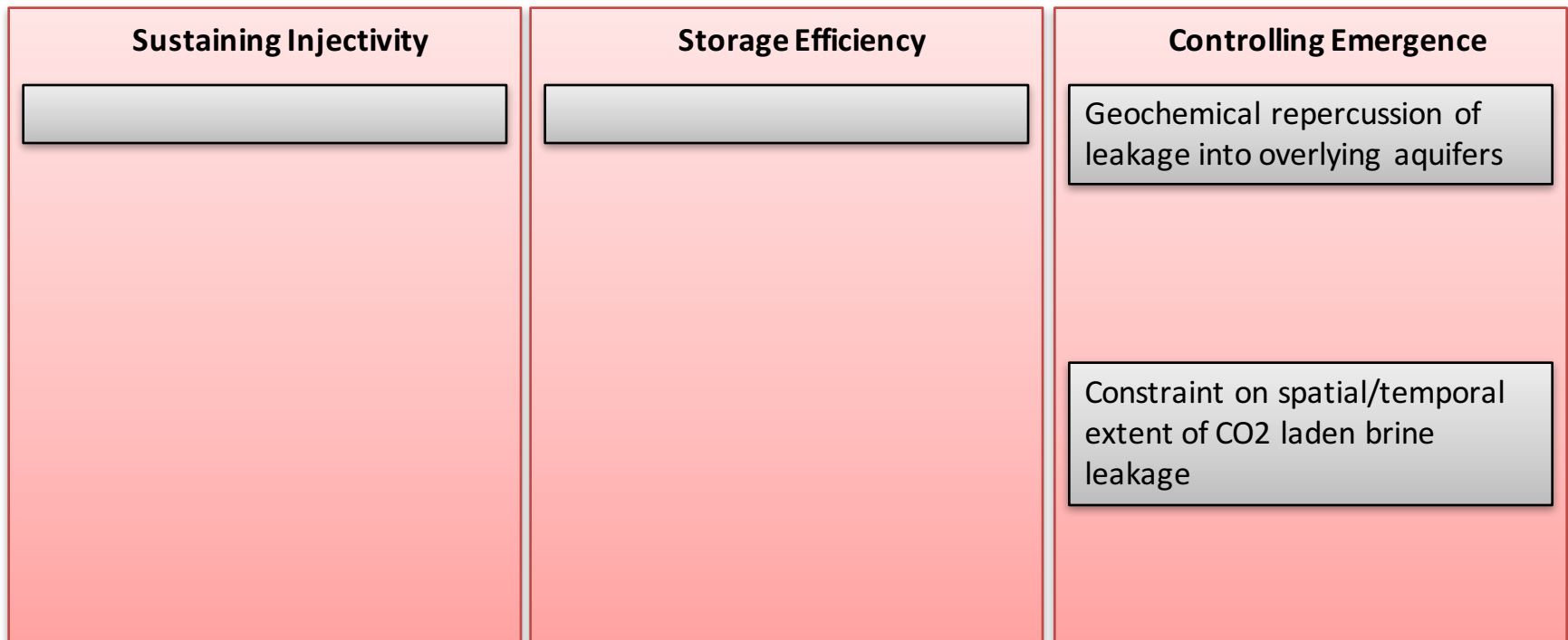


# Geochemistry and transport of CO<sub>2</sub> laden brine in the case of leakage

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# Objectives and Methods

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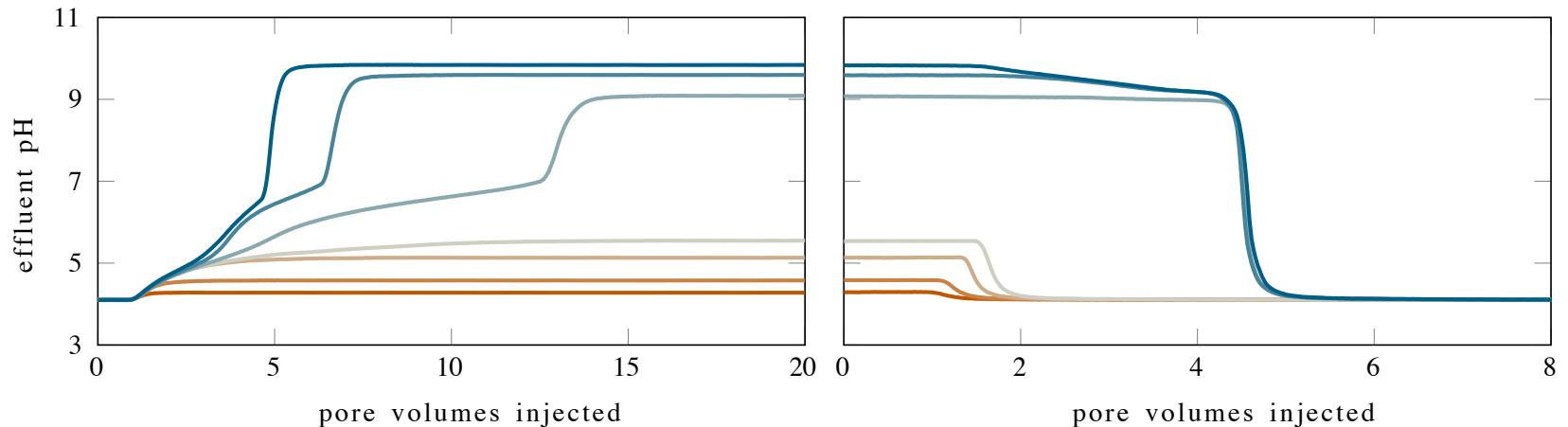
Understand the geochemical effects of CO<sub>2</sub> laden brine leakage into overlying freshwater aquifers

- Propagation of acidity fronts
- Coupled transport of salinity and acidity
- Transport in the presence of a strong buffer (CO<sub>2</sub>)
- Mobilization of bound contaminants



# Results

Acidity transport is unique among cations. We have determined the mechanism of anomalous transport behavior.

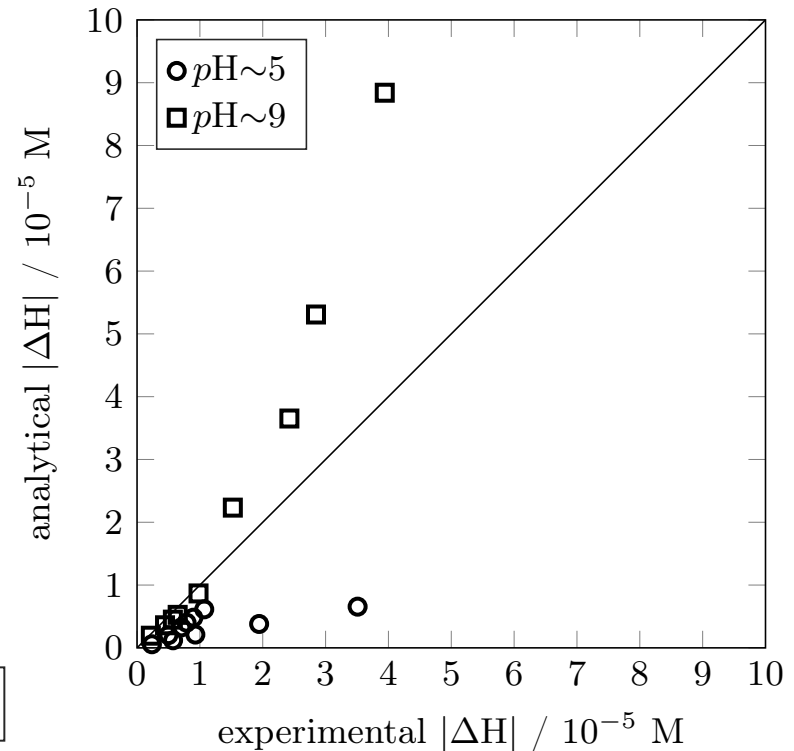
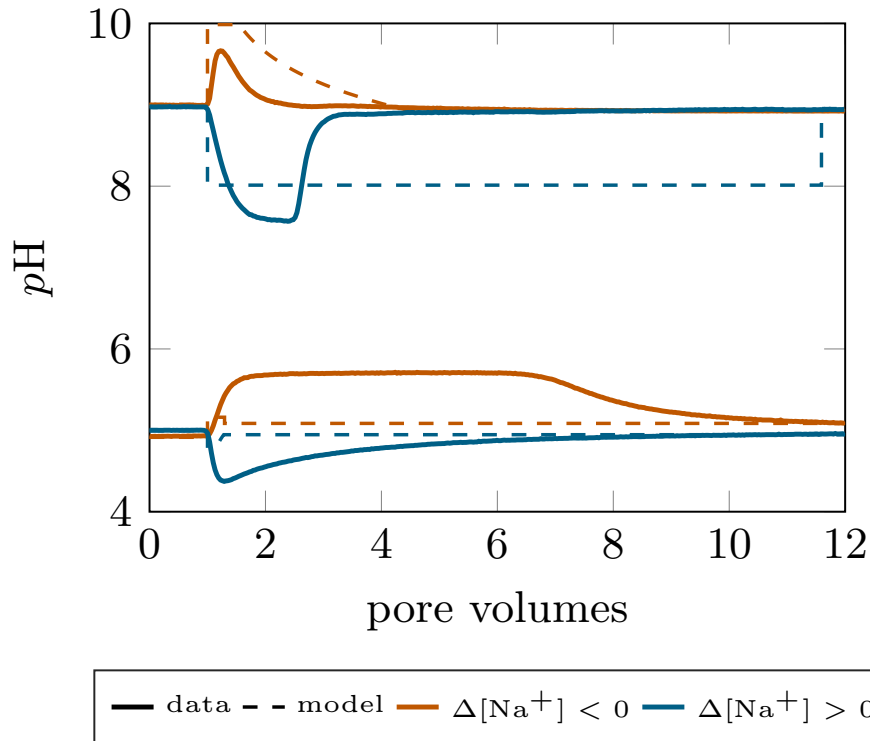


Predicted transport behavior is highly sensitive to model parameters, especially in circumneutral solutions



# Results

Acidity and salinity are coupled through surface chemistry, salinity fronts can induce an order of magnitude change in acidity.



Many chemical models used lack the infrastructure to predict this phenomenon

# Planned Manuscripts

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- Colin Joseph McNeece, Marc Andre Hesse, (2016) Reactive transport of aqueous protons in porous media, *Advances in Water Resources*, 97, 314-325
- Colin Joseph McNeece, Marc Andre Hesse, (2017) Coupled salinity-acidity transport, (in prep.)
- Colin Joseph McNeece, Marc Andre Hesse, (2018) Transport of strontium under variable salinity-acidity condition



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