

Constraints on the Magnitude and Rate of CO₂ Dissolution at Bravo Dome Natural Gas Field

Scientific Achievement

Field-based estimates of magnitude of CO₂ dissolution.
 Low-T thermochronology constraints on CO₂ emplacement.
 → allows us to place the • on the “IPCC diagram”.

Significance and Impact

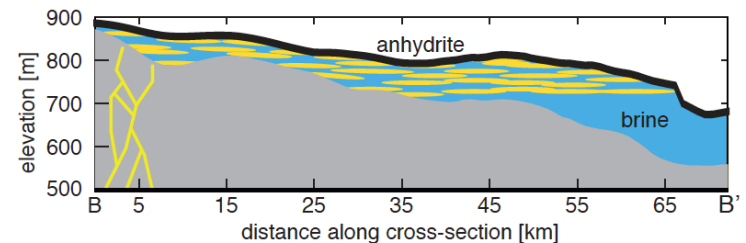
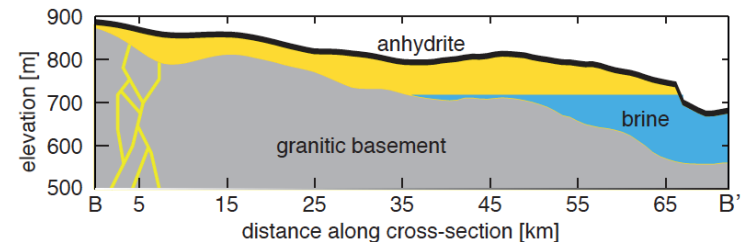
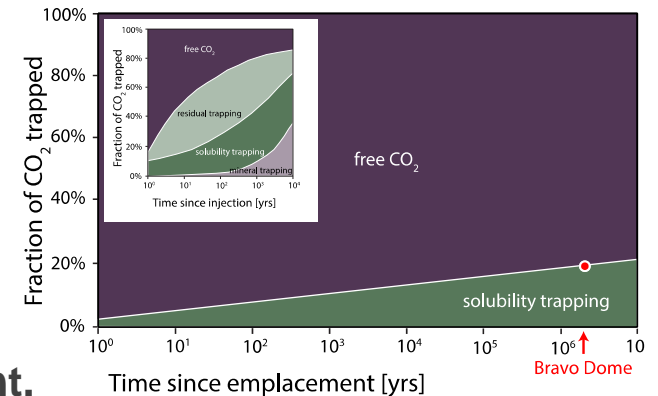
Demonstrates safe storage of 1.3 GtCO₂ for over 1Ma.
 50% dissolution occurred during (shortly after) emplacement.
 50% dissolution after emplacement – by convection?

Research Details

Collected a large cross-disciplinary data base.
 Developed a data-based approach to estimate the total amount of dissolved CO₂.
 Developed a conceptual model sand bodies in silt matrix to estimate convective dissolution.
 Apatite U-Th/He thermochronology on reservoir samples shows localized heating 1.2-1.4Ma.
 Interpret heating emplacement of hot volcanic CO₂.

Publication

Sathaye, Hesse, Cassidy, Stoeckli (201X) Constraints on the Magnitude and Rate of CO₂ Dissolution at Bravo Dome Natural Gas Field, in review *Proc. Natl. Acad. Sci.*



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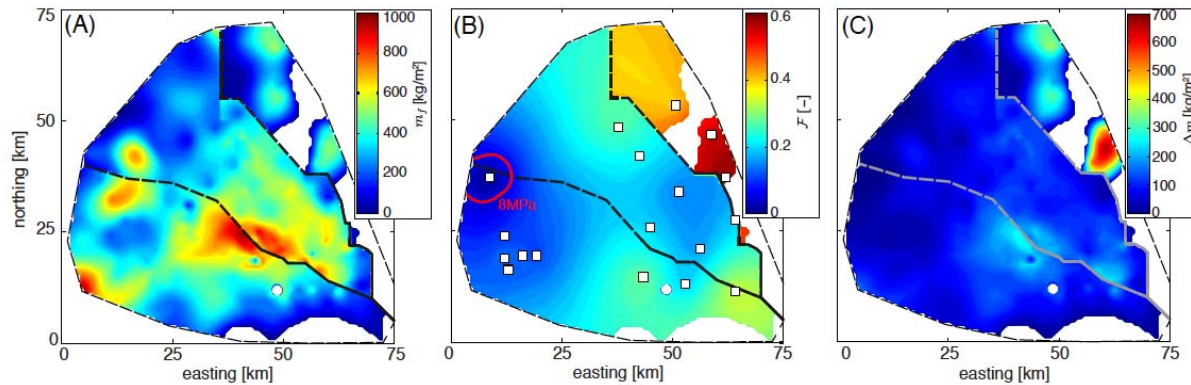


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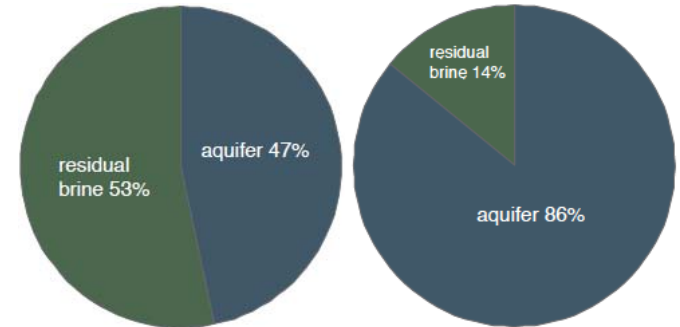
Magnitude of CO₂ dissolution (20% of total)



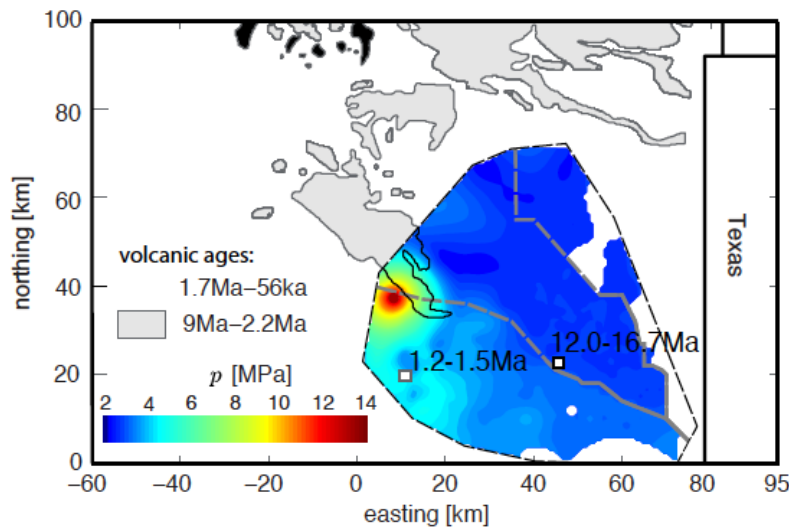
Dissolution mechanism

Main reservoir

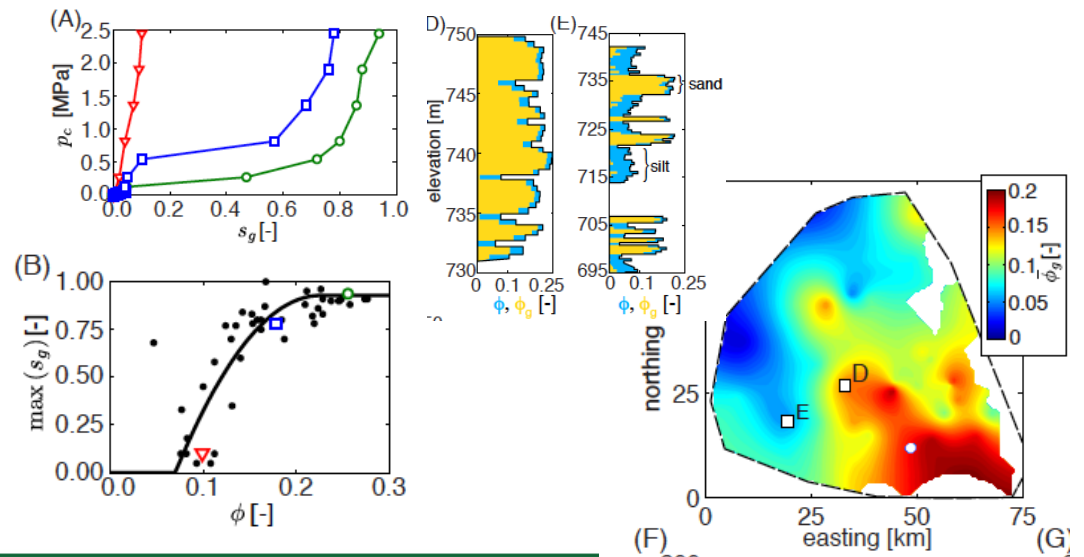
NE-segment



Thermochronology



Saturation estimates



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