

# Natural examples of CO<sub>2</sub> seepage in Utah and structural factors considered for CO<sub>2</sub> sequestration reservoir and cap rock systems

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## Abstract

CO<sub>2</sub> sequestration in sedimentary basins is a new, important and challenging area in geological sciences. With the recent focus, our understanding of sequestration in geological media has seen much progress. One of the key issues to be addressed is leakage of CO<sub>2</sub> during or after sequestration, seen in combination with reservoir capacity. Reservoir characteristics and cap rock systems forms the fundament for site selection for CO<sub>2</sub> sequestration purposes. In this context, a major challenge relates to investigations of the cap rock systems, because they are strongly dependent on deformation of the succession, with bearing on local tectonic imprint.

Natural examples of on-going CO<sub>2</sub> seepage can be observed in the Green River area, Utah; these sites also show bleaching patterns consistent with circulation of reducing fluids in the past. The various bleaching patterns suggest a significant link to rock and fracture permeability, in that bleaching follows porous layers and can be traced along fractures developed in tight rocks. This exemplifies that fault and fracture systems act as conduits in many cap rock successions of Utah. This underlines the importance of understanding the relationship between bleaching patterns and characteristics of fractures.

Since cap rock leakage is vital for permanent CO<sub>2</sub> sequestration, detailed study of bleaching patterns associated with CO<sub>2</sub> seepage will assist in understanding and predicting the characteristics and retention capacity of cap rock succession above CO<sub>2</sub> sequestration reservoirs. We present datasets from Utah to illustrate the mobility of CO<sub>2</sub> and reducing fluids through tight cap rocks, which on a regional scale are considered good top-seals.