CO_2 Enhanced Oil Recovery (EOR) and Sequestration: Advances in Seismic Acquisition

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New technologies are being developed to produce CO_2 from industrial sources for EOR methods and sequestration in oil and natural gas reservoirs across the U.S. The technical challenge is the containment and accountability of large volumes of injected CO_2 within these oil and natural gas reservoirs. High resolution seismic methods can be used to delineate and assess the reservoirs for CO_2 injection feasibility as well as quantitative reservoir management, monitoring and leakage detection. Recent advances in seismic acquisition include low impact vibroseis energy sources, enhanced source control electronics and acquisition methodology. These advances directly result in a limited cultural footprint, including densely populated urban environments and agricultural regions as well as higher quality seismic datasets. A combined 3-D and 2-D seismic approach to applying seismic attribute analysis is necessary for both the detection and mapping of subtle discontinuities that could represent small-scale (approaching subseismic) faults or other geological anomalies.