

The Wyoming Well Atlas: Visualizing the Wyoming Hydrocarbon Landscape

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As Carbon Capture and Storage (CCS) advances as a strategy for reducing the emission of anthropogenic CO₂, it will become increasingly important for operators, regulators, policy makers and the general public to understand the large scale challenges inherent to the process. Geologic sequestration (GS) has been proven to be a viable method for storing CO₂, but the identification and characterization of potential sites for permitting purposes requires analyzing all existing artificial penetrations multi-dimensionally. In particular, well location, distribution and density, depth, status, and spud date, along with associated well-log and construction data are factors which must be carefully examined to determine the risk and viability of a GS project. The extended scope and high level of individual and combined complexities of these spatial, temporal, and informational elements requires the use of sophisticated visualization and analysis tools to effectively inform permitting, review, and regulatory decision-making processes.

To assist CCS industry personnel, regulators, NGO's, local governments, the general public and other stakeholders better understand the scope and extent of well distribution and characterization, the Wyoming Well Atlas (WWA) has been compiled to assist in the permitting, review of permits, and the development of policy regarding GS injection wells. It was developed using public-domain data from the Wyoming Oil and Gas Conservation Commission and produced in a format which could be readily viewed by multiple stakeholders, requiring little technical expertise. The WWA, an electronically distributable, multi-platform application, contains maps, temporal animations, tables, histograms and metadata for all Wyoming hydrocarbon wells. Information in the WWA include well type and status, spud dates, well density, well depth, and company. For instance, the movement and increase of deeper well construction from basin rims inward over time can be clearly seen, along with the impacts of economic downturns, the surge of coal-bed methane development, and sheer density of borehole penetrations in localized areas. Although targeting Wyoming GS stakeholders, the WWA also serves as a template for other states to create visualization tools to assist in GS communication efforts.