

Remote sensing has been heavily used in searching for surface indicators of "leaking" subsurface oil and gas. One line of investigation looks at structural analysis of space imagery in search of subsurface traps. Another seeks alteration at the surface caused by chemical changes related to surface-reaching oil or gas. Alteration anomalies and lineament analysis can aid in finding new petroleum by revealing structural and chemical relationships analogous to already known fields. Exploration for oil and gas has always depended on surface maps of rock types and structures that point directly to subsurface conditions favorable to accumulating oil and gas.

Oil and gas result from the decay of organisms that are buried in muds that convert to shale. Heating through burial and pressure from the overlying later sediments helps in the process. The decaying liquids and gases from petroleum source beds, dominantly shales after muds convert to hard rock, migrate from their sources to become trapped in a variety of structural or stratigraphic traps. Trapped hydrocarbons then migrate vertically producing alteration anomalies at the surface.

Exploration for new petroleum sources begins with a search for surface manifestations of suitable traps. Mapping of surface conditions begins with reconnaissance, and if that indicates the presence of hydrocarbons, then detailed mapping begins. The two most useful indicators discernible in airborne or spacecraft remote sensors data are fracture systems (mainly lineaments) which can control or affect the migration of gas and oil to the surface and geochemical alterations of surface rocks by hydrocarbons, which lead to compositional and color changes.

Using a combination of digital elevation models, aerial photography, and topography, geotech.org develops data sets of fracture orientation, fracture length, fracture density, and structure, analyzes them statistically, which identifies the areas of greatest hydrocarbon potential.

### Examples

[\*Terrain Analysis of Jace Field\*](#)

[\*Kiowa County, Colorado\*](#)

[\*Terrain Analysis of Second Wind Field\*](#)

[\*Cheyenne County, Colorado\*](#)

[\*Terrain Analysis of Moore – Johnson Field\*](#)

[\*Greeley County, Kansas\*](#)