Chapter 4

The GIS Project for the Geologic Assessment of In-Place Oil Shale Resources of the Uinta Basin, Utah and Colorado

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Chapter 4 of 7
Oil Shale Resources of the Uinta Basin, Utah and Colorado

By U.S. Geological Survey Oil Shale Assessment Team

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A geographic information system (GIS) focusing on the Uinta Basin of northeastern Utah was developed as an analysis tool for the U.S. Geological Survey's (USGS) 2010 assessment of in-place oil shale resources in the Eocene Green River Formation. The Energy Resources Science Center of the USGS has also developed an internet mapping service (IMS) to deliver the GIS data to the public. This online mapping tool utilizes information from a database about the oil shale endowment of the western United States and converts the data into geospatial layers for analysis. The ability to view and query geologic features on an interactive map facilitates (1) an understanding of domestic oil shale resources for strategic planning, (2) formulating economic and energy policies, (3) evaluating lands under the purview of the Federal Government, and (4) developing sound environmental policies.

Several types of data are included in the GIS project, which contains oil shale zone boundaries, borehole locations, isopachs, oil shale Fischer assay results, and resource assessment results in tabular and geospatial data formats. The distribution and richness of oil shale for 18 assessment zones are illustrated in specialized maps created by the USGS Oil Shale Assessment Team; these are referred to as "raster maps or models." Models for the 18 oil shale zones are included in the Uinta Basin GIS project. The IMS integrates these data with thematic geospatial layers for geographic reference using a web service-based architecture. The thematic layers or map services available through ArcGIS Online (ESRI, 2009) may include themes formally named Imagery, Streets, Shaded Relief, and Topography. Each formal theme can contain additional geospatial content, examples of which include:

- Highways
- Major and minor roads
- Railways
- Water features
- Administrative boundaries
- Cities, parks, and landmarks
- Public Land Survey System (PLSS)
- Surface ownership
- Surface and outcrop geology

To access the IMS and to download spatial data that formed the basis of the GIS for the Uinta Basin, click on the following USGS Oil Shale Assessment Web site link: *(http://energy.cr.usgs.gov/other/oil_shale/*). Several data formats are provided, including Environmental Systems Research Institute (ESRI, 2006) shapefiles, cell-based GRIDs, and Triangular Irregular Network (TIN) models. These data are also exposed as web services based on a variety of industry-standard encodings, including Keyhole Markup Language (KML), Web Mapping Service (WMS), and ArcGIS Server REST. Additional encodings may be added based on technological need. Information for accessing these services is also available at the website.

All content is documented, based on standard metadata requirements. Access to the metadata is provided in a variety of formats that are incorporated into the downloadable datasets and can be viewed using the IMS.

References Cited

Environmental Systems Research Institute (ESRI), 2006, ArcGIS, ver. 9.2: ESRI, Redlands, California., *http://www.esri.com/software/arcgis/index.html* (last accessed August 20, 2009).

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