



Geographic Information Science and Technology

National Biofuels Transportation Network

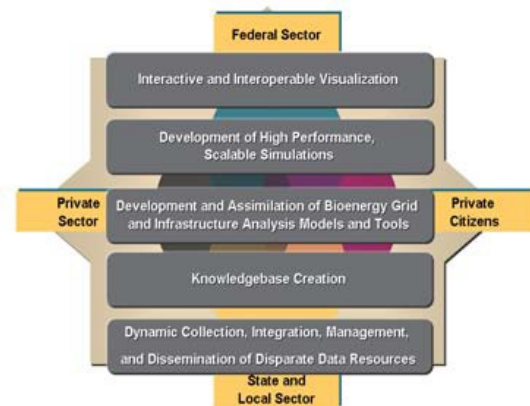
Spatial Data for Visualization and Analysis in the BioKDF

Transportation Challenges for Biofuels Distribution

The United States produces approximately 12 billion gallons of ethanol and biodiesel fuel annually. Over 75% of this productive capacity is located in the upper midwestern region of the country, a region that is separated by long distances from most of the primary consumer population centers for biofuels. As this component of the fuel supply increases in production there is a need for data to visualize the existing biofuel distribution system in order to identify critical infrastructure dependencies that might affect fuel supplies between the centers of production to the centers of demand, and to analyze efficient means of biofuel distribution between these locations.

A Multi-layered, Multi-modal Network

Utilizing the world class computing and information technology capabilities, ORNL is designing and developing a standards-based dynamic and scalable architecture that integrates, from distributed archives, Bioenergy infrastructure related data, models, and tools developed by government, academic, and private sector partners. A robust geospatial technology framework provides efficient data collection, integration, management, analysis through Geographic Information Systems; visualization through Geographic Information and Exploration Systems; and dissemination through Geographic Information Services. Web-enabled and role-based interactive access will ensure wide accessibility and usability of the Bioenergy Knowledge Discovery Framework.



Layer Attributes

- Easy information access to current status of Bioenergy in the US
- Common operating data, models, and tools representing the entire Bioenergy supply chain
- Incorporate models and tools for environmental, economic and social impact analysis
- Support policymaking by visualizing the outcomes of proposed policies
- Defining where research or demonstration funds should be targeted
- Improve public awareness, education, and outreach

Routing Analysis Capability

- Integration of proprietary (ArcGIS Server, ArcIMS, Custom Database) and standards based (Web Mapping Service and Web Feature Services) data into a customizable, browser based viewer.
- Integration of dynamic sensor and weather data collected in the field including moving object tracking capabilities made available to consumers via Web Feature Services.
- Provision of access to server-side geo-processing tasks through a Geographic Exploration System (Google Earth) that allows the user to simultaneously utilize multiple disparate data sources.
- Extension of desktop spatial analysis capabilities, such as interactive feature buffering and complex spatial and textual querying, into a browser based framework.
- Evaluation of GIS, GES, and spatial data servers to assess the performance and capabilities of both the server and client software using a variety of data sources under high stress conditions.

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