

Bioenergy Knowledge Discovery Framework

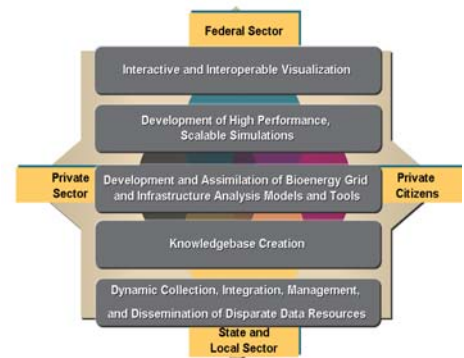
Developing the Architecture for a Shared Environment for Collaboration

Decision Support Challenges for Bioenergy Assurance

Successful assimilation of the national bioenergy infrastructure not only relies on efficient operations of its components, but more so on the effective harmonization with enabling critical infrastructures including energy, transportation, water, agriculture, and commerce. These complex interdependencies of infrastructures across multiple space and time scales can not be addressed by a single model or tool. Consequently, an integrated decision support environment must be developed where data, modeling and visualization tools can be shared by multiple stakeholders to understand, design, and develop efficient local and regional practices for the bioenergy infrastructure that can be guided with strategic policy decisions to ensure national bioenergy assurance.

A Standards-based Dynamic and Scalable Architecture

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.



Benefits to Stakeholders

- 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

Relevant Capabilities and Ongoing Activities

- 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 geoprocessing 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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