



**US Army Corps
of Engineers®**

Engineer Research and
Development Center

Geospatial Data Analysis Facility

Purpose

The U.S. Army Engineer Research and Development Center (ERDC) provides state-of-the-art expertise in the application of spatial information analysis technologies, including geographic information systems (GIS), remote sensing (RS), and global positioning systems (GPS). The [Geospatial Data Analysis Facility \(GDAF\)](#) applies these technologies to support a diverse array of civil and military environmental and natural resource research projects.

Capabilities

The GDAF includes a research staff with diverse backgrounds in areas such as geography, computer science, mathematics, civil engineering, geodesy, modeling, landscape architecture, geology, remote sensing, photo interpretation, wildlife ecology, biology, statistics, and computer cartography. The staff maintains Top Secret/SCI clearances and has access to secure (SIPRNET) processing facilities to support classified processing requirements. The GDAF staff has conducted numerous projects involving advanced applications of spatial analysis technologies, including the following:

- Landscape dynamics modeling and analysis.
- Multispectral and hyperspectral digital image processing, classification, and analysis using satellite and aircraft data.
- Landscape mapping and change detection.
- Airborne geophysics (magnetometer and EM data) processing.
- Data fusion using LIDAR and hyperspectral data.
- River basin/flood plain analysis.
- Shoreline erosion detection and mapping.
- Development of customized, high-quality cartographic map products.

Supporting Technology

Computer equipment in the GDAF includes:

- Dedicated high-performance server environment with more than 15 terabytes of RAID 5 storage.
- 18-node Linux cluster supporting secure geospatial processing requirements.
- Ability to scan and conduct raster-to-vector database development from any paper map source.
- Access to dedicated field data collection team with state-of-the-art global positioning system and data collection hardware, including a Leica ScanStation 3D laser scanner.

Software resources in the GDAF include:

- ArcGIS software, with Spatial Analyst, 3D Analyst, and Geostatistical Analyst extensions.
- ArcGIS Server (Enterprise/Advanced level) software (including Image Server and ArcSDE).
- Oracle Enterprise DBMS.
- ERDAS and ENVI image processing software.
- Site serves as an ESRI Beta site—with access to latest technology.

Benefits

Use of GIS, RS, and GPS technologies helps bring a spatial perspective to environmental phenomena, allowing researchers to visualize relevant environmental information and to model information in new and unique ways. The GDAF supports a diverse array of environmental and natural resource research projects including wildlife habitat analysis, wetlands delineation and monitoring, flood modeling/mapping, emergency response activities, aquatic plant mapping, landscape analysis, and image analysis. In addition, the GDAF is involved in a number of advanced military environmental science projects to support the Corps' research efforts in that area.

Success Stories

The research staff has provided support to a wide array of direct-allotted civil and military programs, and reimbursable efforts. Some recent applications include:

- Use of airborne magnetometer data to predict distribution of explosive compounds over impact areas.
- Use of airborne LIDAR and hyperspectral data to map stamp sands in Lake Superior.
- Development of a customized ArcGIS application for site selection to support the Joint Rapid Airfield Construction Program.
- Development of a stand-alone application to support conversion of CE-QUAL-W2 water quality model output into NetCDF format.

Point of Contact

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