



SAGE - ArcGIS to SEDRIS Conversion Tool

SEDRIS Technology Conference
January 9, 2004

Jeremy Loomis
jlloomis@prologic-inc.com



About ProLogic

- Small 8(a)-certified software development firm
- Offices in Fairmont, WV and Washington DC area
- Mixed Model Business - *Products and Services*
- Customers include Air Force, Army, NASA
- SEDRIS Associate
- ESRI Business Partner, STK Business Partner
- Core Competencies
 - Geospatial Technologies
 - GIS, Visualization, Modeling & Simulation
 - Knowledge Management
 - Testing, IV&V

ProLogic SAGE





Outline

- SAGE Overview
- ESRI ArcGIS Overview
- SAGE Workflow
- Summary



SAGE Overview



Motivation

- M&S community uses geospatial datasets such as terrain, imagery, and features
- These datasets are often created, modified, and managed using GIS technologies
- ESRI's ArcGIS provides powerful data import and spatial analysis functions useful for geospatial data creation and enhancement, but does not provide support for SEDRIS
- The Toolbox will bridge the gap, with the SAGE tool exporting from ArcGIS to SEDRIS



About SAGE

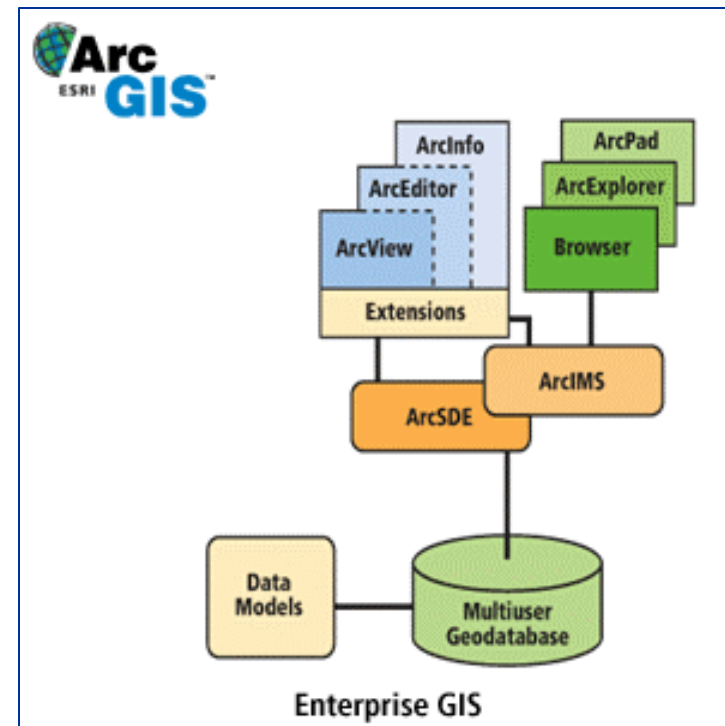
- SAGE allows users to create SEDRIS transmittals from ArcGIS
 - SAGE is an ArcGIS extension (Windows only)
 - Requires an ArcGIS 8.x license (ArcView level)
 - Integrates SEDRIS 3.1.2 API and ESRI ArcObjects
 - Converts ArcGIS data to SEDRIS:
 - Feature Datasets to Feature objects
 - Terrain Rasters to PropertyGrid objects
 - TIN Datasets to Polygon objects
 - Image Rasters to anchored Image objects
 - Thematic Rasters to PropertyGrid objects
 - Attribute tables to ClassificationData, PropertyValue objects
 - Incorporates user-friendly GUI
 - Available at <http://gviz.prologic-inc.com/sgt/sage/>



ESRI ArcGIS Overview

ArcGIS System

- ArcGIS – scalable GIS that supports:
 - Data visualization & query
 - Data analysis & integration
 - Data creation & modification
 - Data management
- ArcGIS desktop products (Windows) include:
 - ArcView
 - ArcEditor
 - ArcInfo
 - several optional software extensions



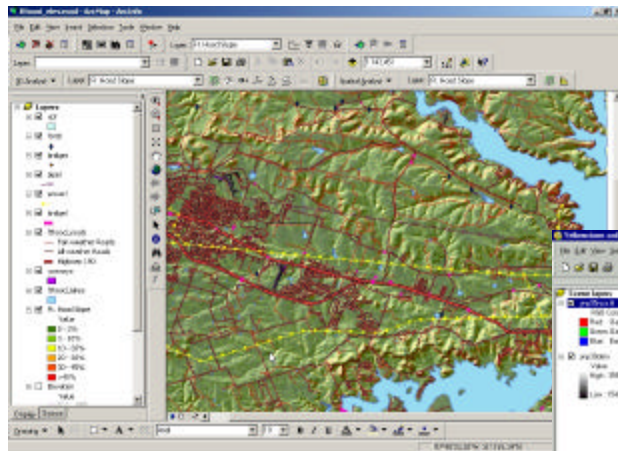


ArcGIS Components

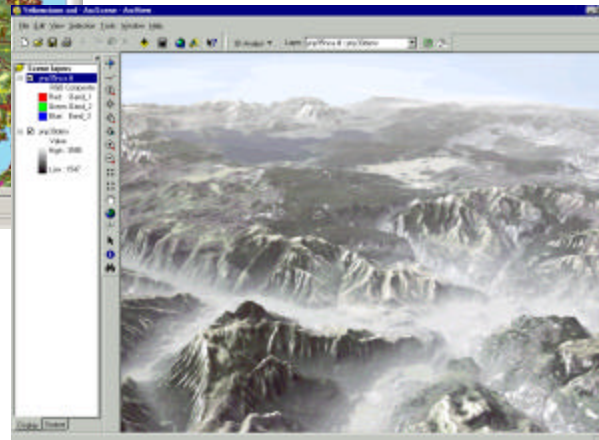
- ArcMap
 - Mapping, editing, analysis
- ArcCatalog
 - Manage spatial data, database designs, creation and management of metadata
- ArcToolbox
 - GIS data conversion (supports most NGA and USGS data) and geoprocessing
- 3D Analyst extension
 - Visualization and analysis of 3D data; ArcScene application
- ArcObjects
 - Collection of COM components with GIS functionality; technology framework of ArcGIS



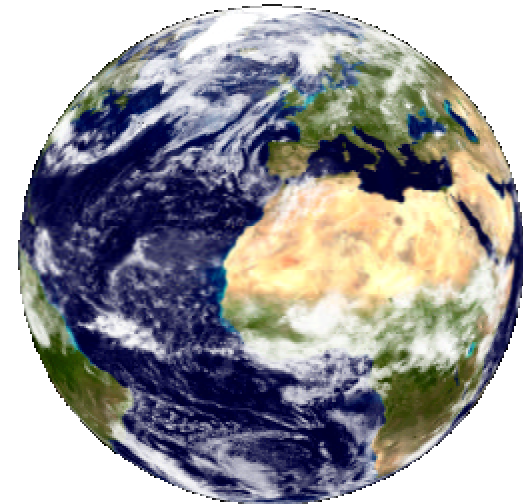
ArcGIS Visualization Apps



ArcMap



ArcScene



ArcGlobe (in ArcGIS 9)



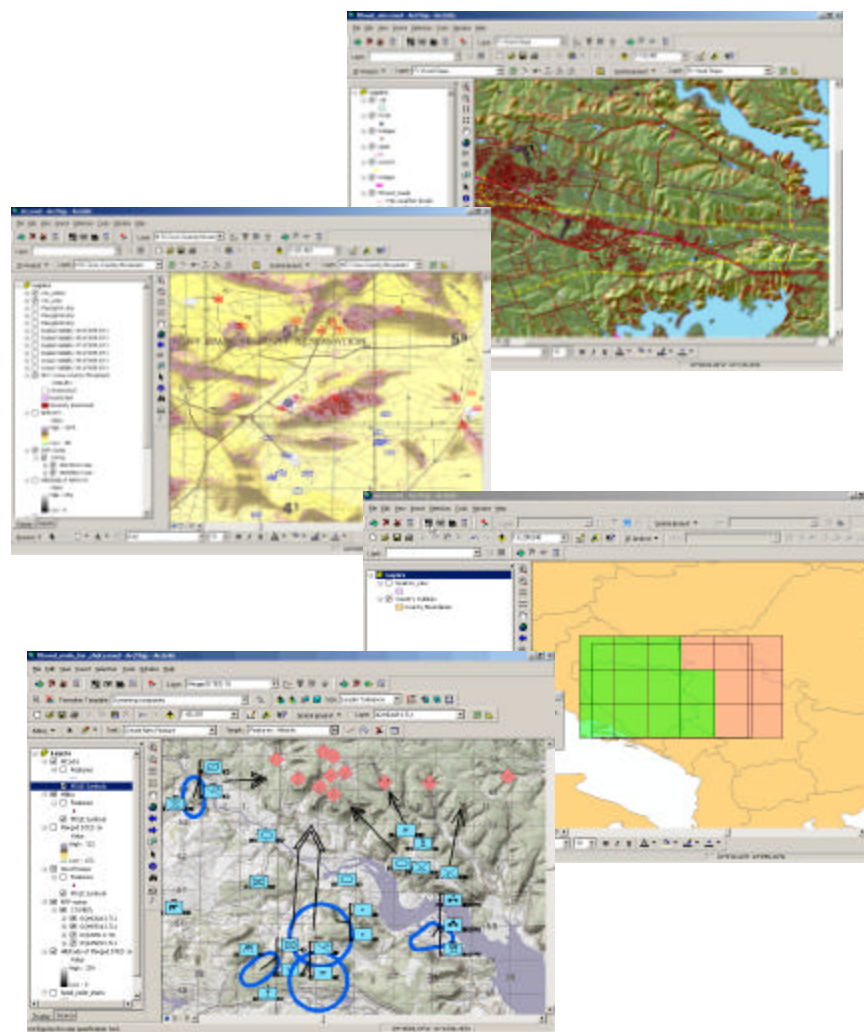
NGA C/JMTK

- Commercial Joint Mapping Toolkit
 - Standardized, commercial, comprehensive toolkit of software components for the management, analysis and visualization of map and map-related information.
 - Replaces government-owned JMTK
- Program Team:
 - Northrop Grumman IT TASC (prime)
 - Environmental Systems Research Institute, Inc. (ESRI)
 - ERDAS
 - Analytic Graphics, Inc. (AGI).
- Foundation of C/JMTK offering is ESRI's ArcObjects framework



Military Analyst

- Raster Map Tool
 - View and select tiles of CADRG and CIB data
- Vector Map Tool
 - Directly read and symbolize VPF data
- DTED Tool
 - Directly read, merge, and view available DTED files
- Terrain Tools
 - Perform LOS analysis, viewshed analysis, and create threat domes
- Military Overlay Editor
 - Manage and display the order of battle with military symbols





ProLogic
Incorporated

SAGE Workflow



Export Specifications

- Filters
 - Select which “parts” of the ESRI map document should be exported.
- Identification
 - Determine if any of the layers correspond to “known” types.
- Raster Domain
 - Specify rasters as terrain, image, or thematic.
- CA&M (Classification, Attribution, & Metadata)
 - Describe how classification and attribution should be performed and what metadata should be used.



Export Specifications (cont'd)

- Altitudes
 - Specify the meaning of z-values in the input.
- Spatial References
 - Detail the spatial references used in the input and requested for the output.
- Organizing Principles
 - Specify the arrangement of created SEDRIS objects by classification or grid cell.
- Metadata
 - Provide descriptive metadata information for the transmittal.

SAGE GUI

ProLogic, Inc. SAGE - FtHood_vmap1_DEM_b_utm.mxd

File View Sections Tools Help

Name	Type	Use	ID	#tot	#fdq	#exp	#row	#col
Ft. Hood	Map	✓						
fh_transc2 route.trail	Polyline	✗		0	0	0		
fh_transc2 route.bridgel	Polyline	✗		0	0	0		
fh_transc2 route.railrdl	Polyline	✓	VPF	12	12	12		
fh_transc2 route.roadl	Polyline	✓	VPF	218	218	218		
fh_hydroc2 route.daml	Polyline	✗		0	0	0		
fh_hydroc2 route.watcrsl	Polyline	✓	VPF	62	62	62		
fh_elevc2 arc	Polyline	✓	VPF	293	293	293		
dem1702668	Raster	✓					466	402
dem1668975	Raster	✓					466	402
dem1668947	Raster	✓					466	402
dem1668893	Raster	✓					466	402

Export Specifications

Raster Domain CA&M Altitudes Spatial Refs Org. Principles

Classification Related Features

- Classified Layers (4 layers)
 - RAILROAD TRACK (1 layer)
 - fh_transc2 route.railrdl (RAILROAD TRACK)
 - ROAD (1 layer)
 - fh_transc2 route.roadl (ROAD)
 - RIVER (1 layer)
 - fh_hydroc2 route.watcrsl (RIVER)
 - ELEVATION CONTOUR LINE (1 layer)
 - fh_elevc2 arc (ELEVATION CONTOUR LINE)
- Unclassified Layers

Output

Environment Root

- AHRF
 - FHD
 - CRF
 - CD
 - UOF (fh_transc2 route.railrdl)
 - CD
 - UOF (fh_transc2 route.roadl)
 - CD
 - UOF (fh_hydroc2 route.watcrsl)
 - CD
 - UOF (fh_elevc2 arc)
 - FHD
 - UOF
 - UOF (fh_transc2 route.railrdl)
 - UOF (fh_transc2 route.roadl)
 - UOF (fh_hydroc2 route.watcrsl)
 - UOF (fh_elevc2 arc)
 - ImageLibrary
 - Image - dem1702668
 - Image - dem1668975
 - Image - dem1668947
 - Image - dem1668893

Classification Data

EDCS tag: 317

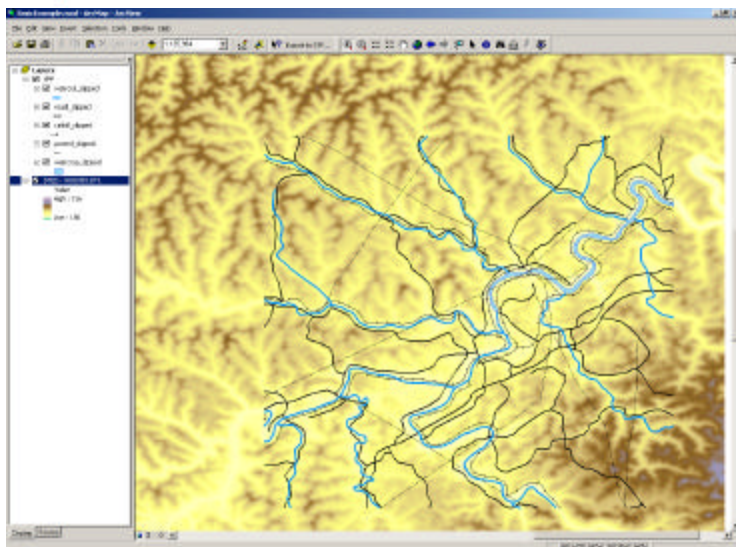
EDCS description: ELEVATION CONTOUR LINE

< Back Next > Finish Section >>

Defaults generated.

1/2/2004 11:16 AM

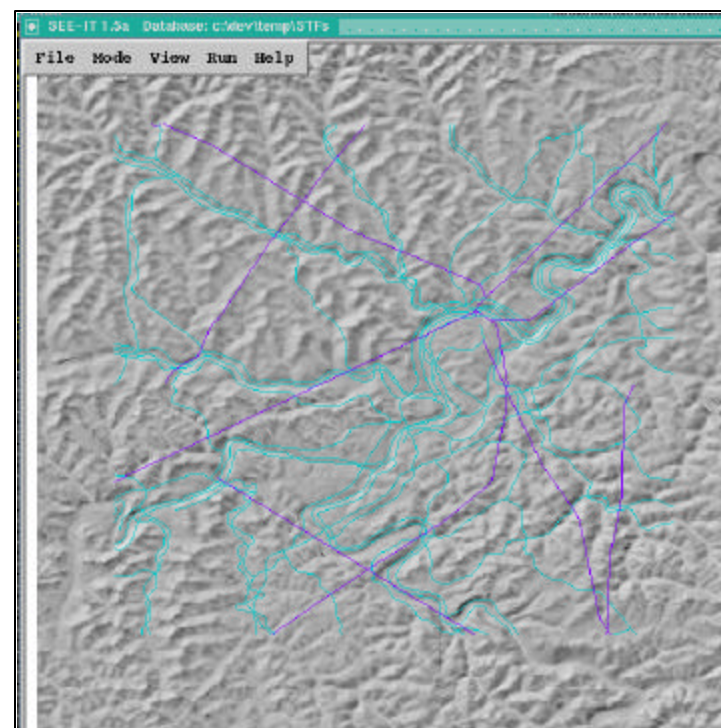
Feature/Elevation Grid Example



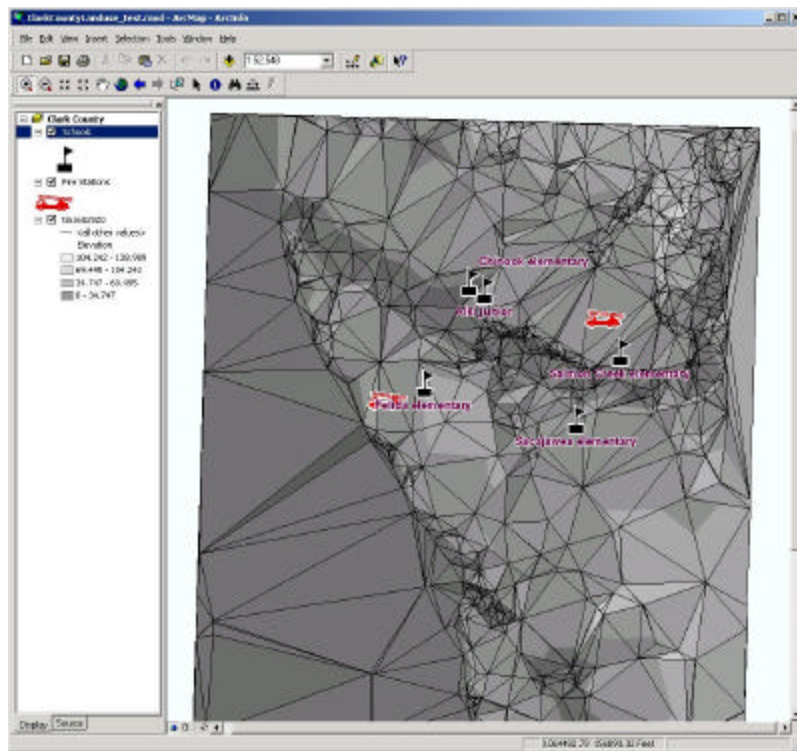
VPF&DTED in ArcGIS



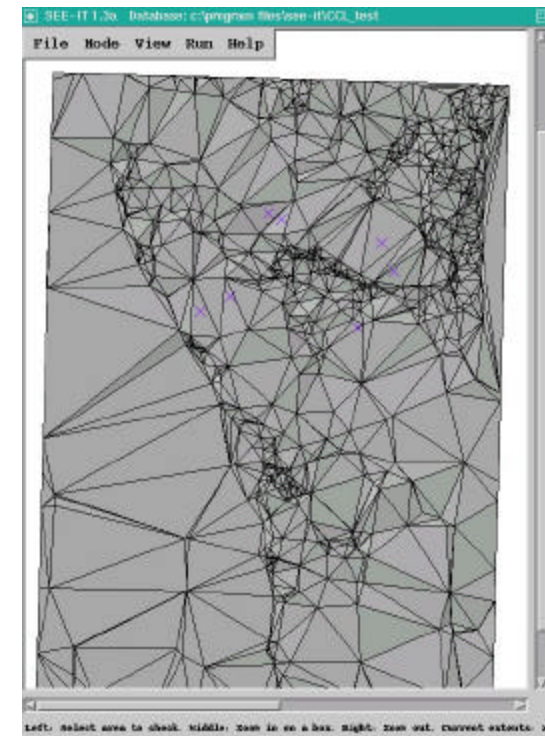
STF in SEE-IT



Feature/TIN Example

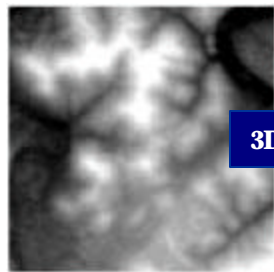


Features & TINs in ArcGIS



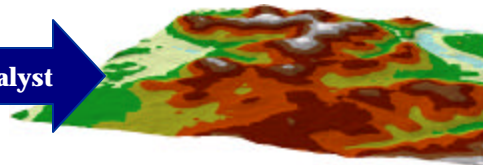
STF in SEE-IT

Draped Imagery Example



DEM data

3D Analyst

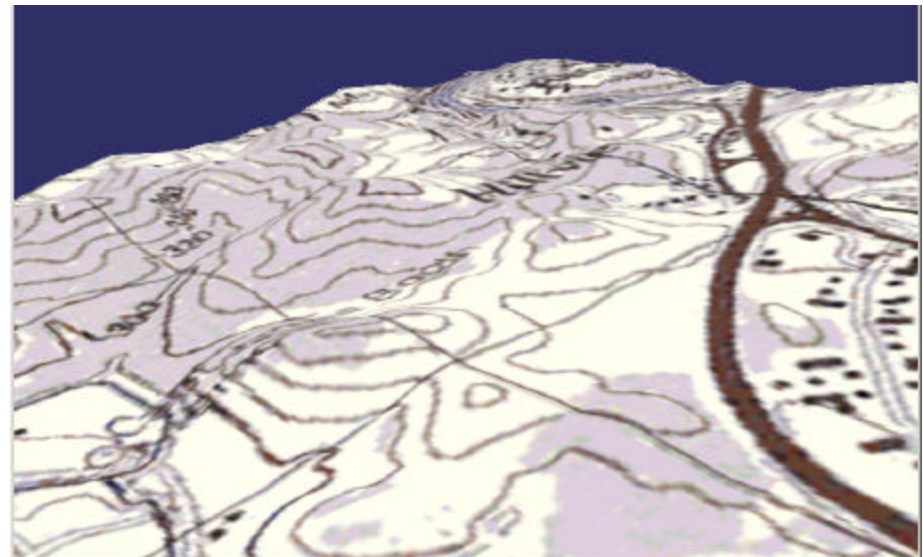


TIN

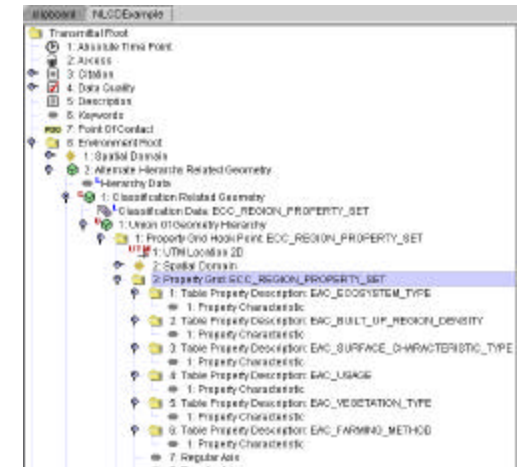


Map Imagery

SAGE

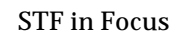
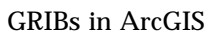


3D display of STF



STF in Focus







ProLogic
Incorporated

Summary



SAGE Features

- Support for:
 - Vector data
 - Terrain meshes
 - Gridded elevation
 - Rasters (image or thematic)
 - Attribute tables
- Automated and user-guided modes
- Architecture for Classification, Attribution, and Metadata
- Full support for SRFs, including 3D & datums



SEDRIS/GIS Toolbox

- SAGE is the first tool
- Future capabilities:
 - Import SEDRIS transmittals into ArcGIS
 - GUI-based support for EDCS mapping
 - Integrate SAGE with other SEDRIS tools
 - Export 3D models supported in ArcGIS 9
 - Leverage ArcGIS strengths in data import, editing, geometric analysis, and topology management to improve database generation



Contact Info

Jeremy Loomis, jloomis@prologic-inc.com

Phone: (304) 333-2686

www.prologic-inc.com