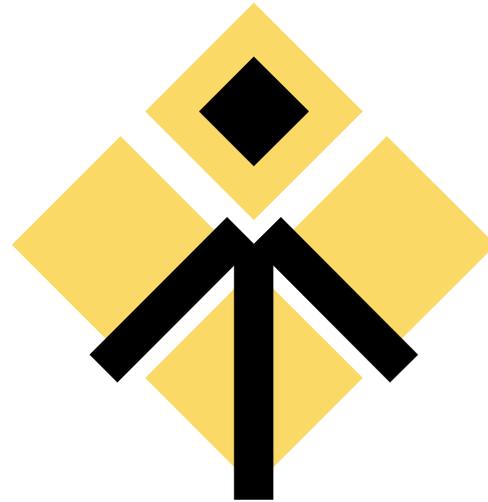


NILS

**National Integrated
Land System**



NILS

**National Integrated
Land System**

**Building a common cadastral data model
and core land records management tools
with object-oriented technology**

NILS Partners

- **BLM**
- **USFS**
- **Bureau of Indian Affairs**
- **Minerals Management Service**
- **Fish & Wildlife Service**

NILS Partners

State

Washington DNR
Arizona State Land Office
Montana
Tennessee
Utah

Local

Maricopa Co, Arizona
Pima Co, Arizona
Pinal Co, Arizona
Oakland Co, Michigan
Polk Co, Oregon

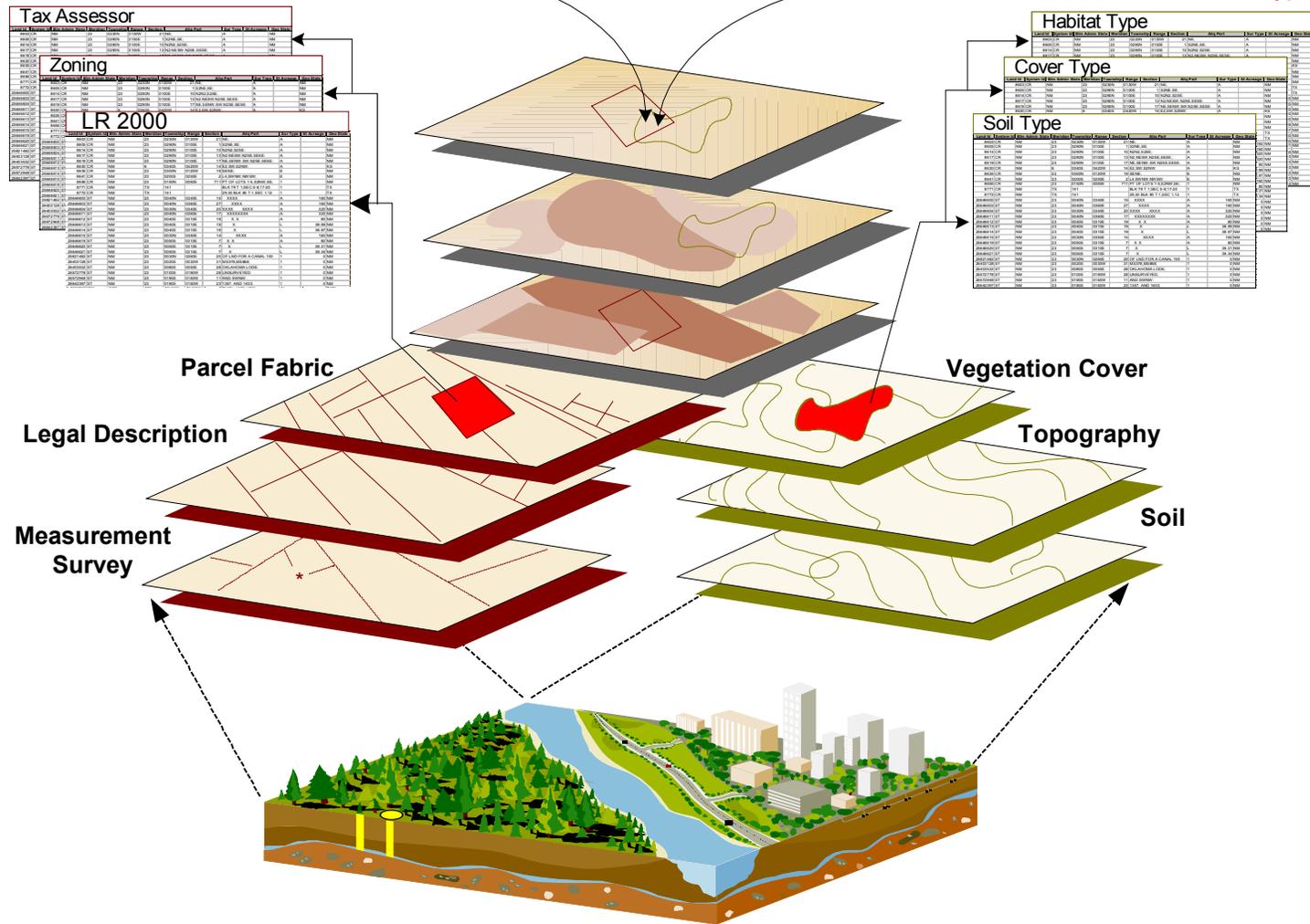
Private

ESRI
Fairview Industries
UCLID

NILS Vision

Assessor Value = \$23,000.00
 Zoning = Light Industrial
 LR 2000 = MTM43258

Riparian = Habitat Type
 Tree = Cover Type
 Erosive = Soil Type

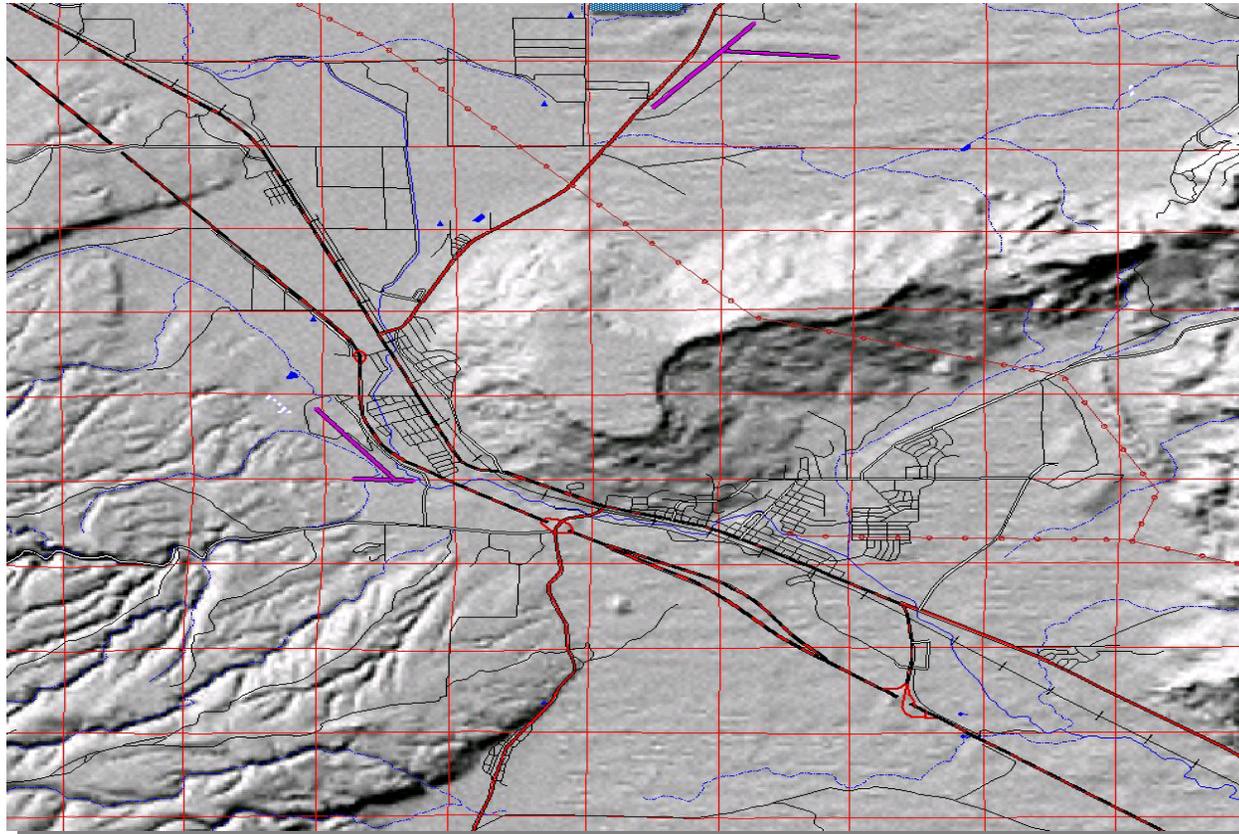


NILS Concept



From Field

NILS Concept

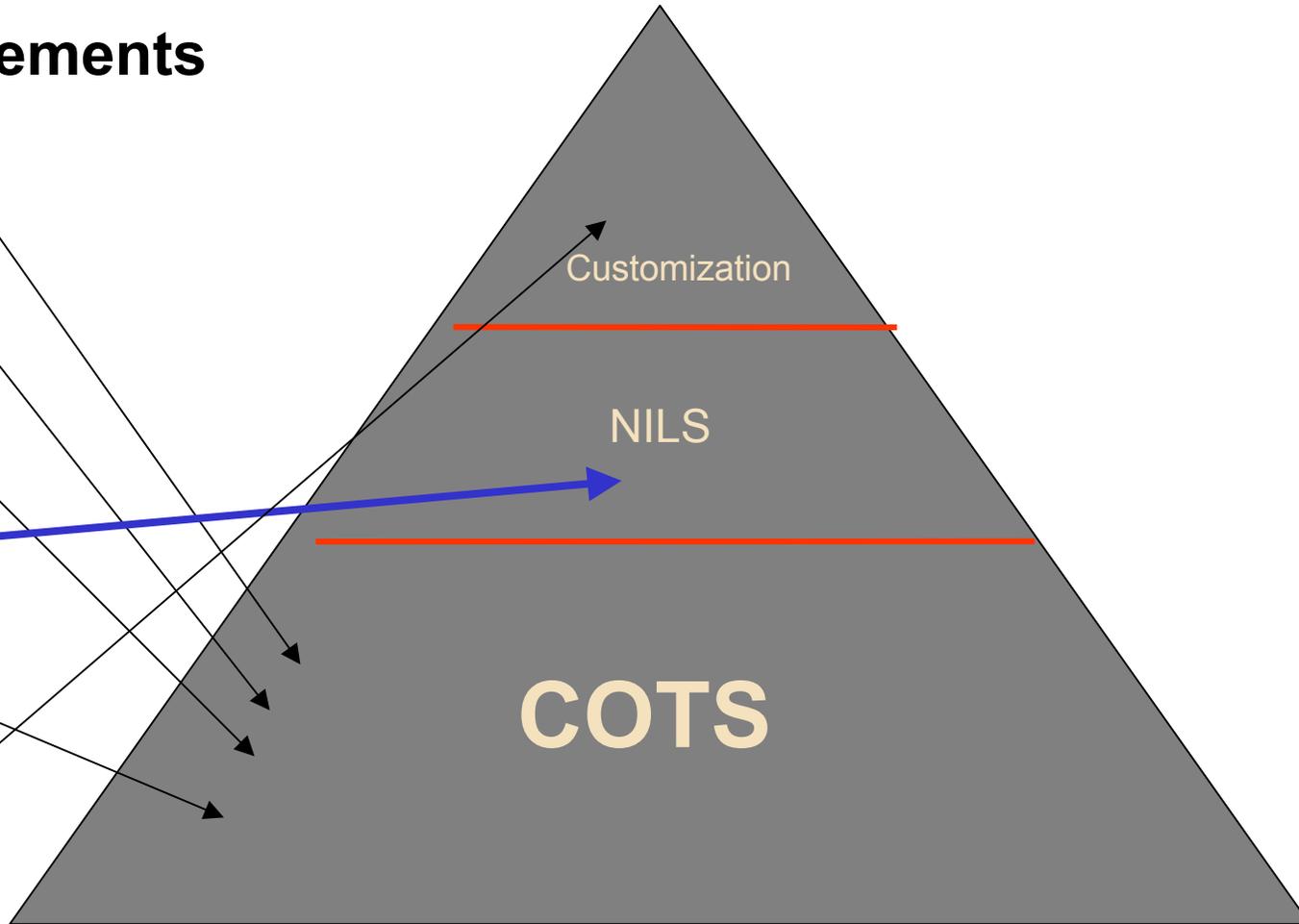


To Fabric

Development Strategy

Requirements

- 1
- 2
- 3
- 4
- 5
- 6



NILS Process

Requirements and Use Case Workshops



NILS Process

Informal Reviews with Users

**BLM Washington/Oregon State office
USFS offices in Portland and Atlanta
TVA
State of Washington DNR
State of Florida DEP
Counties - Polk, Fulton, Thurston**



Informal Review with NILS Advisory Committees

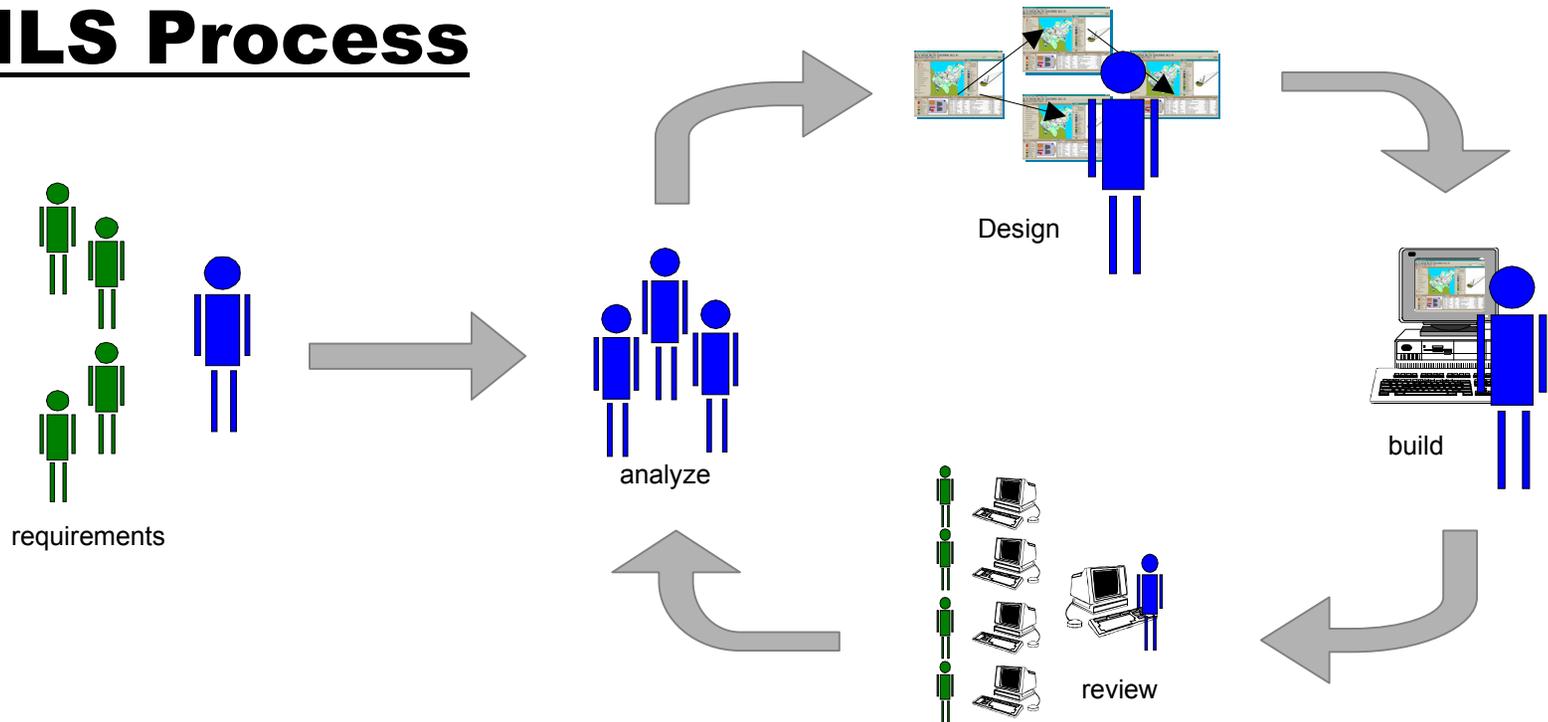
**GCDB Technical Advisory Committee (GTAG)
BLM and USFS Lands program staff
FGDC Cadastral
Subcommittee**



NILS Process

- Draft Completed Nov. 29, 1999
- Public Review (Nov.29,1999 - Jan. 15, 2000)
- Public Presentations - (Nov-Dec 1999)
- Final Report Available March 2000
- Detailed Feature Functions- September 2000
- Currently working on detailed Use Cases for Survey/Measurement Management

NILS Process



**Iterative
Development**



Version 3.0



Version 2.0



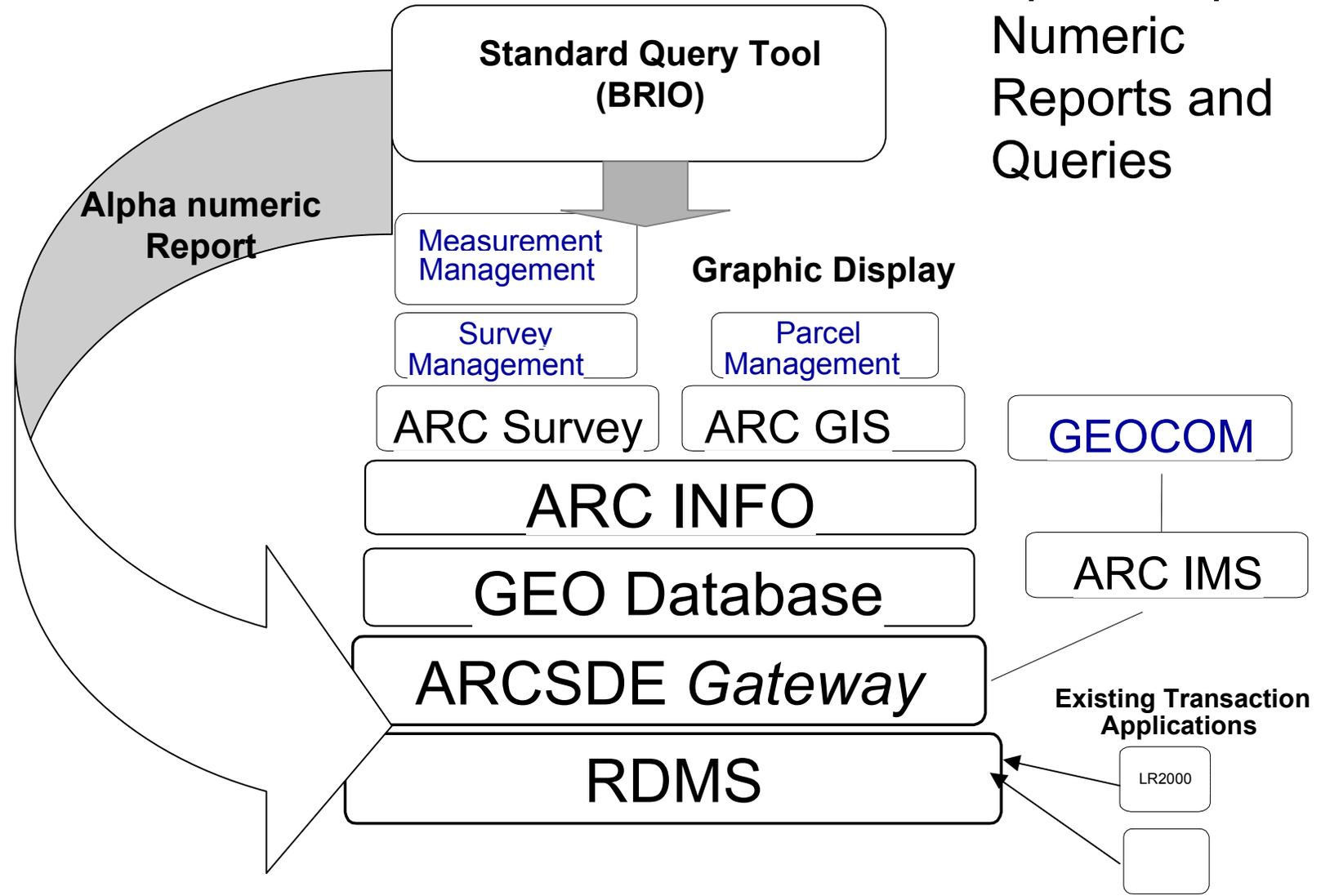
Version 1.0

NILS Process

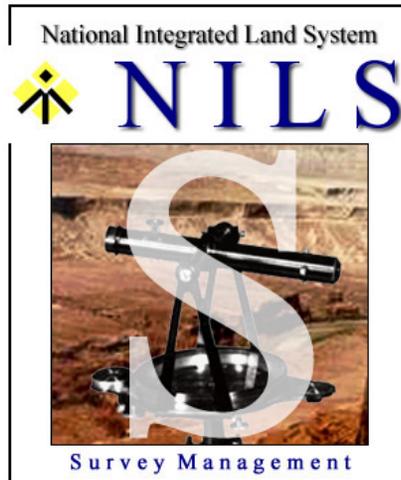


Story Boards

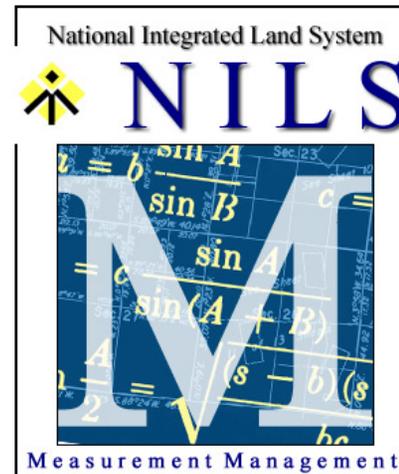
NILS Process



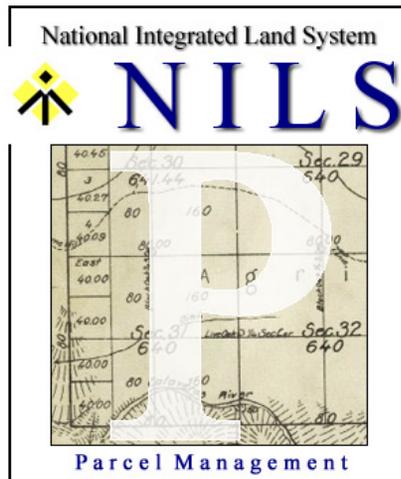
NILS Components



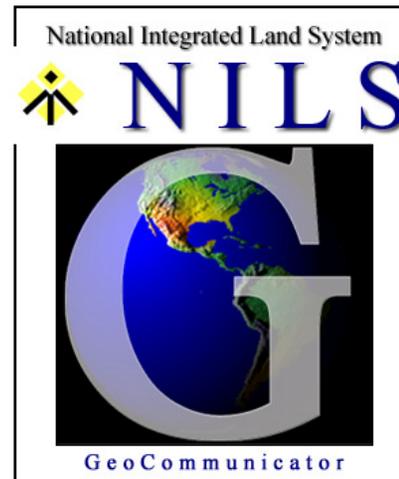
Survey
Management



Measurement
Management

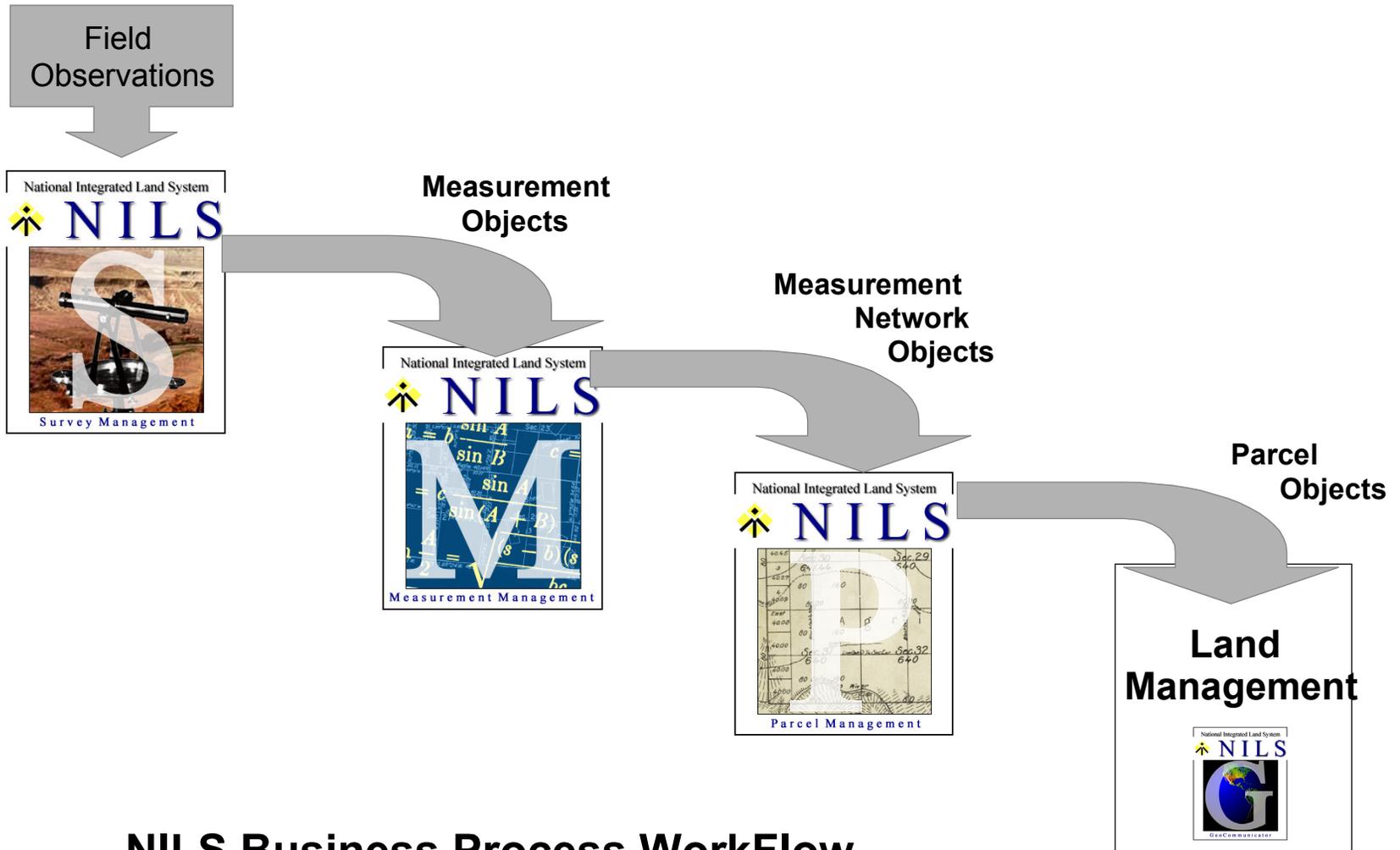


Parcel
Management



GeoCommunicator

NILS Components Relationships



NILS Business Process WorkFlow

Survey & Measurement Management

National Integrated Land System



NILS



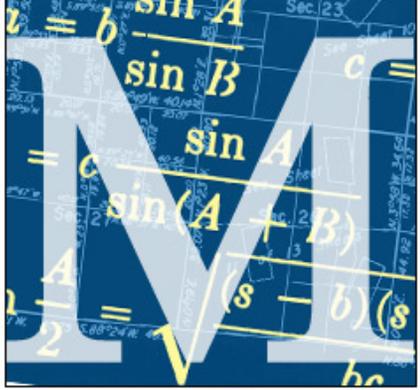
Survey Management

The graphic for Survey Management features a large, semi-transparent white letter 'S' overlaid on a photograph of a surveying instrument (a theodolite or similar) mounted on a tripod in a field. The background of the photograph is a reddish-brown, hilly landscape.

National Integrated Land System



NILS



Measurement Management

The graphic for Measurement Management features a large, semi-transparent white letter 'M' overlaid on a blue background filled with mathematical formulas and symbols. Visible formulas include $a = b \sin A$, $\sin B$, $\sin A$, $\sin(A + B)$, $(s - b)(s - c)$, and bc . There are also some numbers and symbols like 'Sec. 123' and '3' scattered throughout.

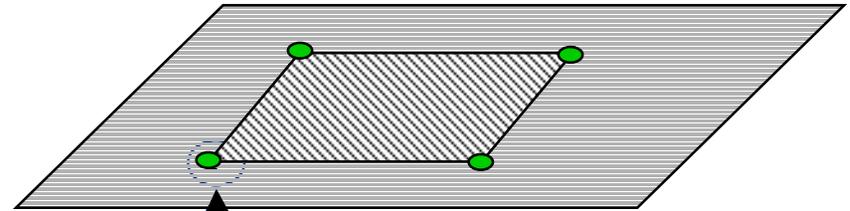


Modified - ArcSurvey

The ArcInfo Extension for
COGO Users and Surveyors

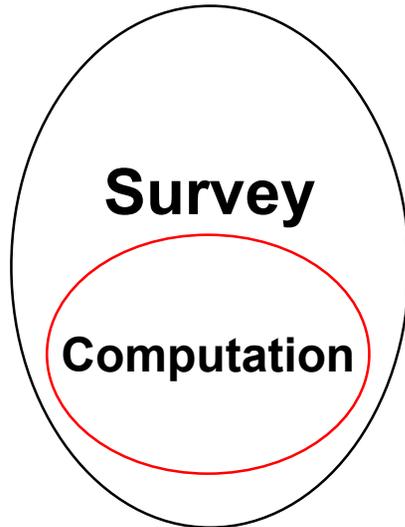
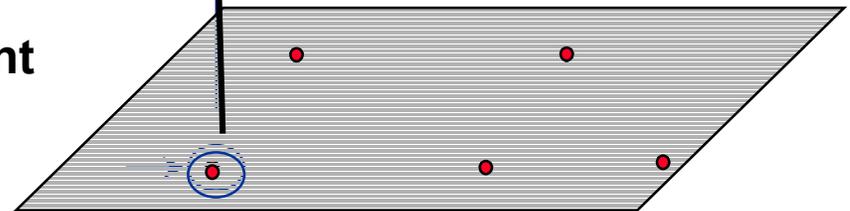
Feature

GIS

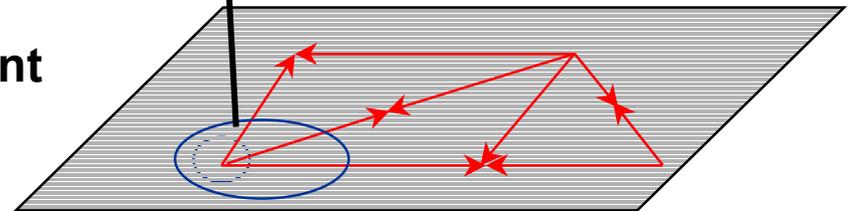


Measurement
Database

Survey Point



Measurement



(All ArcSurvey slides are based on draft design information only)

ArcSurvey is designed to...



- **Manage measurement data in a GIS**
- **Associate measurements with geographic features**
- **Create and edit features using COGO constructions, survey measurements and survey computations**
- **Store raw measurement values, constructions and computations for later reuse**
- **Exchange survey data with 3rd party software and survey sensors**
- **Manage the incremental improvement of a measurement database**
- **Report results from computations**
- **Support and improve geometric quality in the GIS**



ArcSurvey extends the GIS framework to support measurement management:

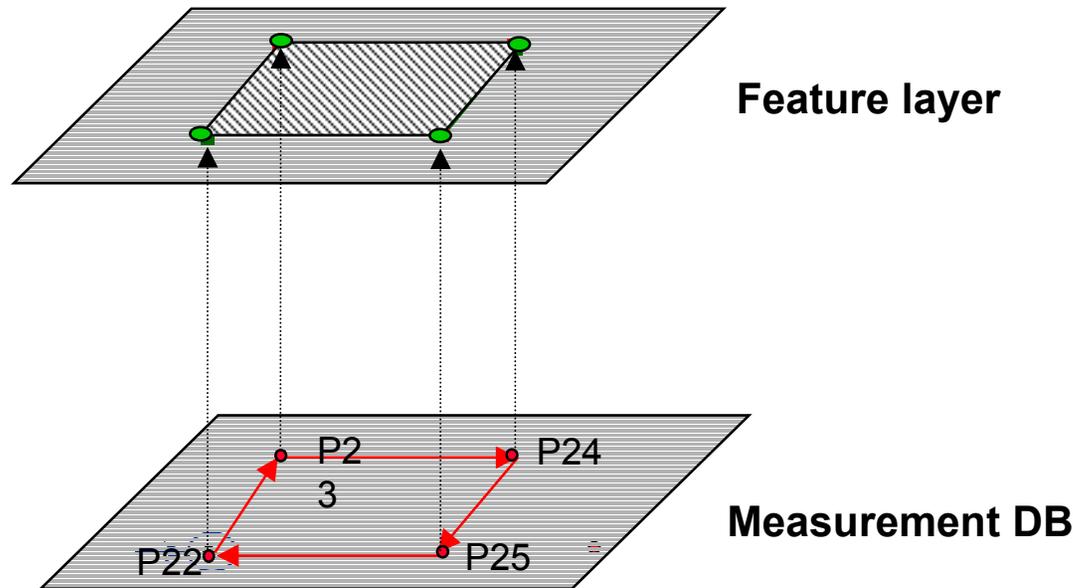
- The data model is extended to support multi-source measurements, feature construction, survey computations, and survey points in association with GIS features.
- The user interface is extended to support measurement collection, editing and display.
- The developer framework is extended with survey objects.



Spatial Quality

ArcSurvey provides the means to maintain survey data and make it part of feature geometry.

Lower order surveys - higher order surveys incrementally improve geometric quality over time for both the measurement database and the associated features.



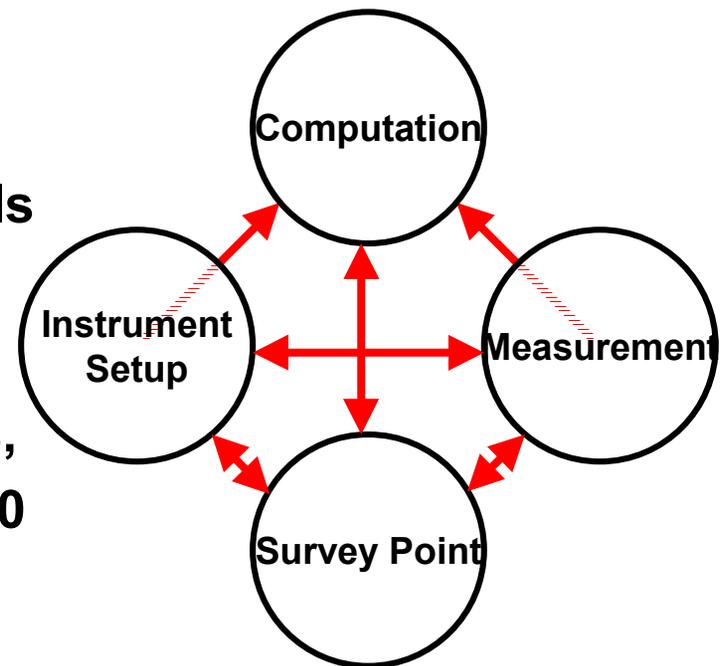
ArcSurvey



Use Cases in the following areas will be detailed...

- **COGO and layout**
- **Least squares adjustment**
- **Edit measurement data and utility tools**
- **Edit parcel fabric**

COURs document included 10 use cases, this has now been expanded to approx 30





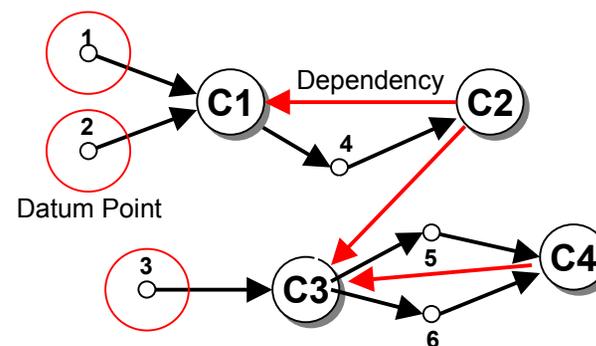
COGO and Layout Use Cases

- **Construct point feature by traverse**
- **Construct point feature by proportion**
- **Construct point feature by intersection**
- **Construct point feature by offset from straight line**
- **Construct point feature by averaging**
- **Construct line feature - simple curve**
- **Construct line feature – straight line**
- ***Construct line feature- spiral curve (future)***
- ***Construct line feature - offset from spiral line (future)***
- ***Construct line feature- median line (future)***
- **Section subdivision**
- **Remove non-boundary line**



Least Square Adjustment Use Cases

- Identify least squares input data
- Display unadjusted data in spatial view
- Display polygon misclosures graphically (values color-coded)
- Apply known corrections to distance measurements
- Apply known corrections to direction measurements
- Create approximate coordinate value for each line endpoint
- Adjust measurement network with least square analysis process
- Develop statistical analysis of adjustment
- Append/incorporate new set of data for adjustment



Edit Measurement Data and Utilities Use Cases



- **Import GCDB data**
- **Import control data**
- **Display measurement data in spatial format**
- **Display/edit source-level data in spreadsheet format**
- **Display/edit control data in spreadsheet format**
- **Display/edit line data in spreadsheet format**

Edit Parcel Fabric Use Cases



- Attribute polygons with legal area descriptions
- Display polygons with symbology by legal area description types
- Annotate polygons with attribute data

Schedule Overview



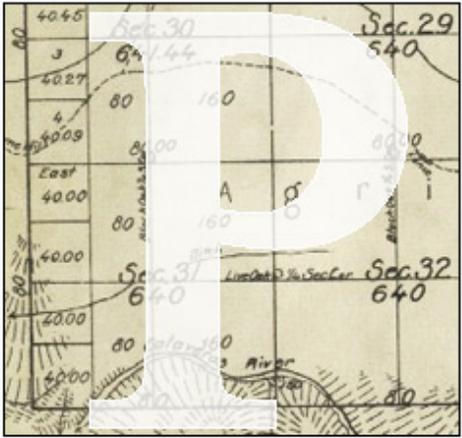
- **Completed work**
 - **Use cases (COUR) – Completed March 2000**
 - **Requirements – Completed September 2000**
- **Work in progress (Survey/Measurement Management)**
 - **Detailed use cases and requirements – Q2 FY 2001**
 - **First prototyping begins – Q3 FY 2001**

Parcel Management

National Integrated Land System



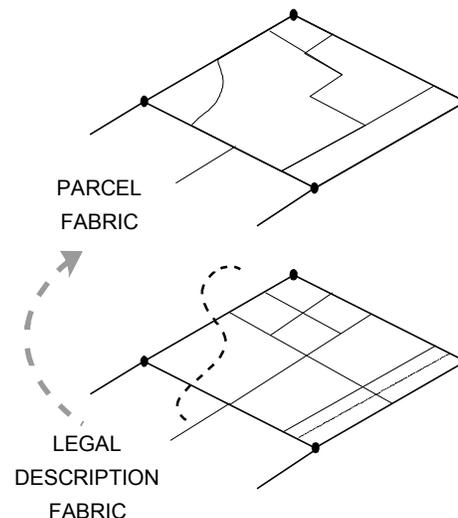
NILS



Parcel Management

Parcel Management

Provides a process for managing land records and cadastral feature data stored in the database model. It will provide custom feature classes, tools, and procedures for editing land records in a transactional, history-tracking environment. Support will be provided to allow users to construct and edit legal description fabrics and to create required parcel fabrics from them. Parcel fabrics may include ownership, land use rights, tax assessment, and others.



Parcel Management

The business processes necessary to maintain land records in an automated environment.





Parcel Management

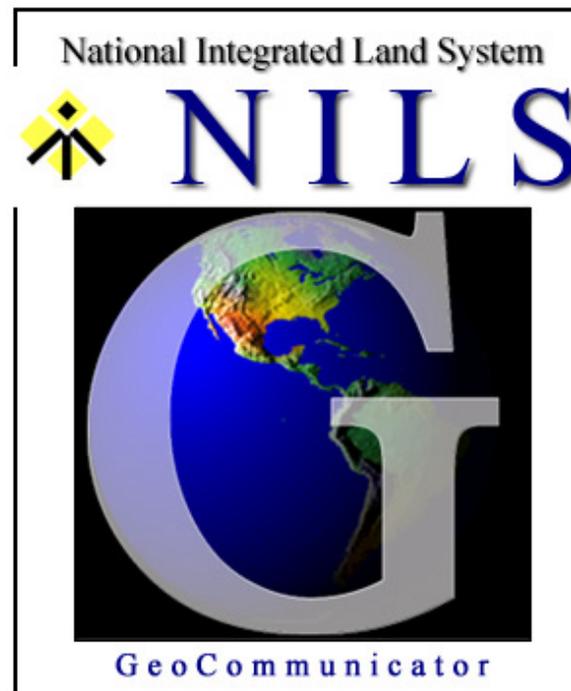
Verify Parcel - the various identification, verification and decision steps required to process the original filing of a document (i.e., deed being recorded or application filed).

Construct Legal Description - allows for creation and maintenance of current and historical legal descriptions.

Edit Legal Description Fabric - allows for generation and maintenance of survey and non-survey descriptions in an integrated geometry layer as the building blocks for parcel legal descriptions.

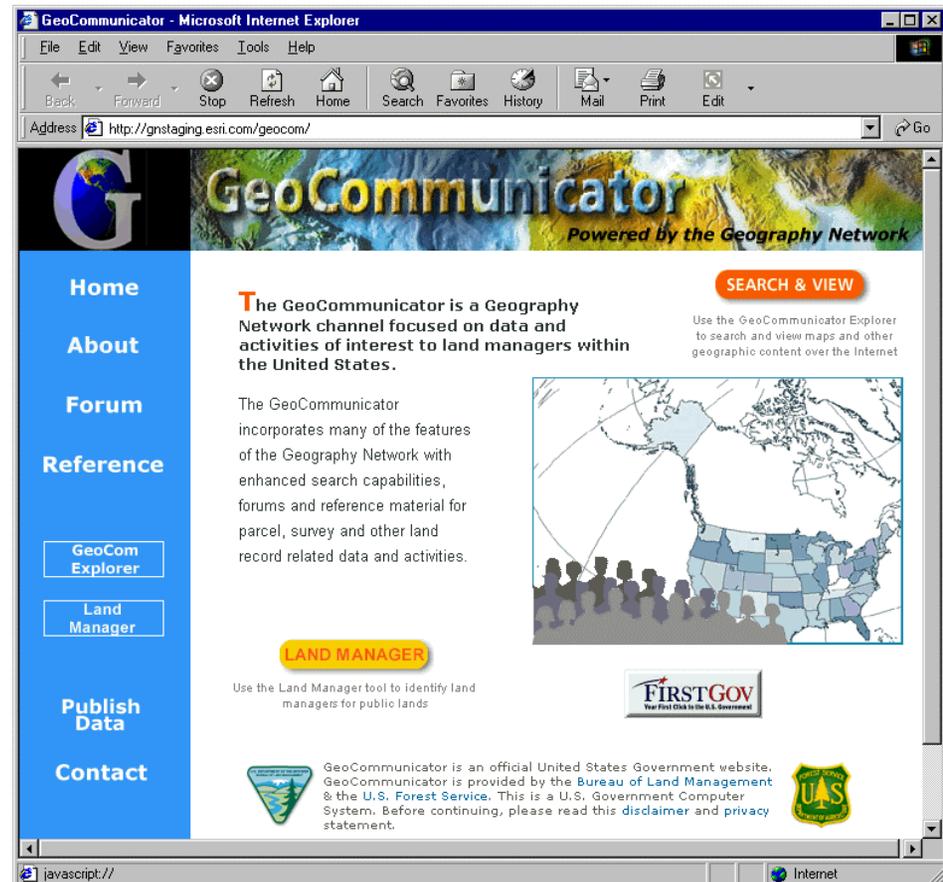
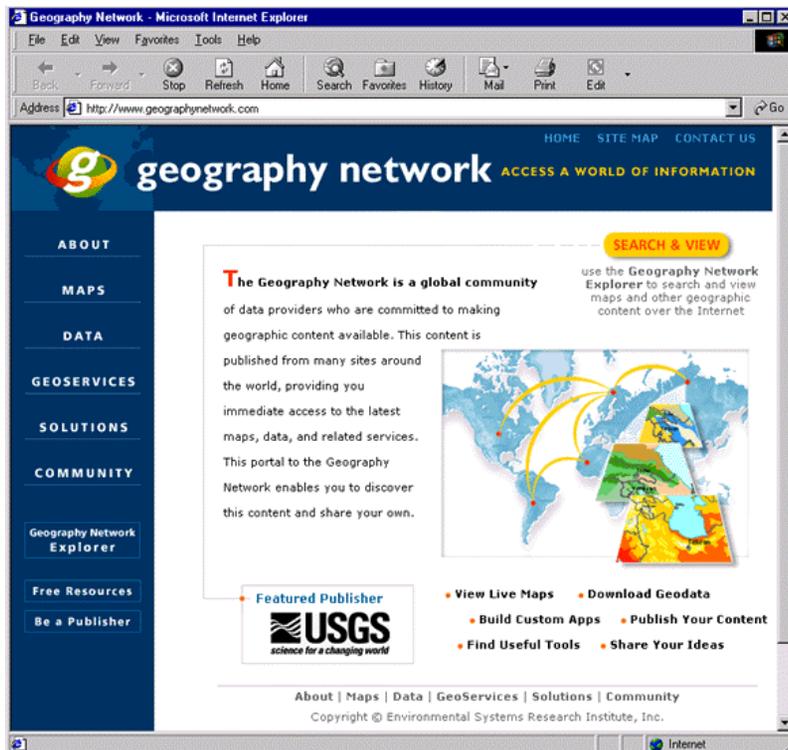
Edit Parcel Fabric allows for building and attributing parcels necessary to maintain a 'coverage' based on a particular business practice (e.g., ownership, rights, and restrictions) in a user-defined geographic area.

GeoCommunicator

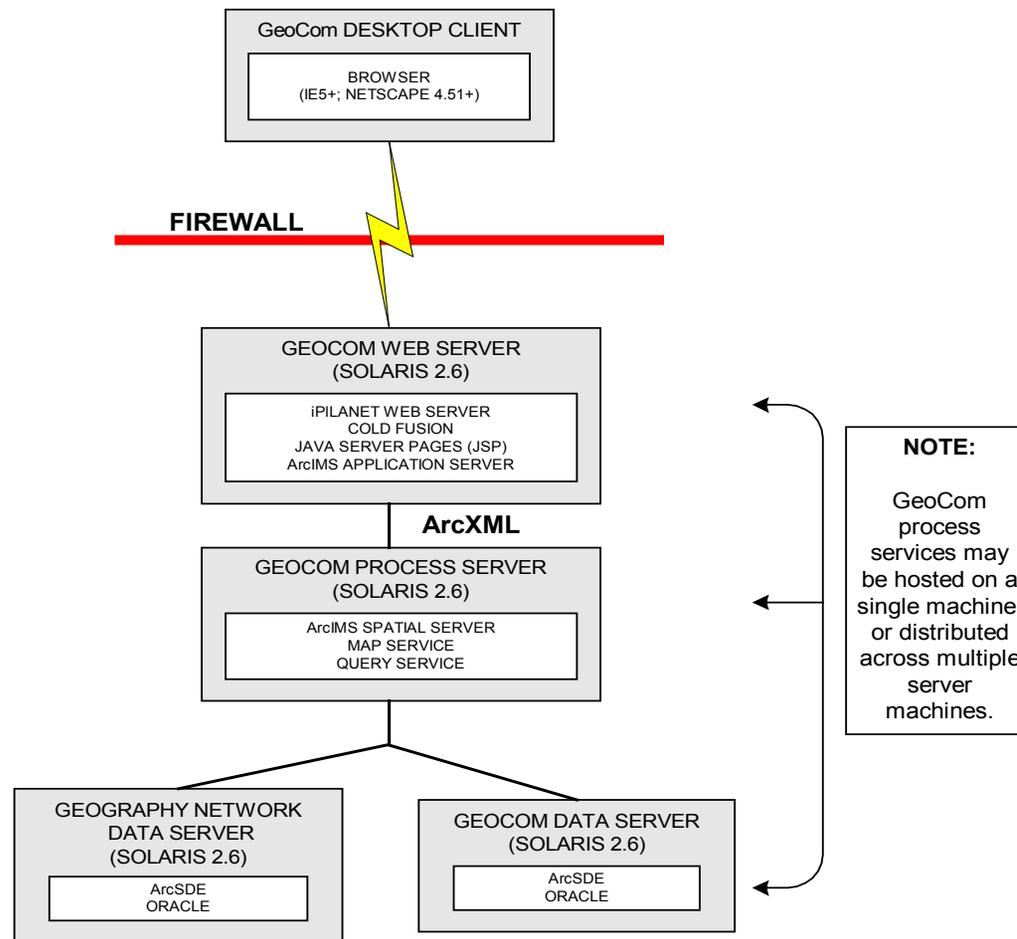


GeoCommunicator “powered by”

GeoCommunicator shares a common database with the Geography Network



GeoCommunicator Architecture



GeoCommunicator Architecture

- **Web site development**
 - Development web site is: <http://gnstaging.esri.com/geocom>
- **Web site status**
 - Forum for GeoCommunicator discussions completed
 - Contact Information completed
 - Publisher Registration completed
 - Map Explorer completed
 - Land Manager Tool completed
 - Subscriber and Activity Notification Function to be completed

GeoCommunicator Home Page



GeoCommunicator
 Powered by the Geography Network

Home
About
Forum
Reference
 GeoCom Explorer
 Land Manager
Publish Data
Contact

SEARCH & VIEW

The GeoCommunicator is a Geography Network channel focused on data and activities of interest to land managers within the United States.

Use the GeoCommunicator Explorer to search and view maps and other geographic content over the Internet

The GeoCommunicator incorporates many of the features of the Geography Network with enhanced search capabilities, forums and reference material for parcel, survey and other land record related data and activities.

LAND MANAGER

Use the Land Manager tool to identify land managers for public lands

FIRSTGOV
 Your First Click to the U.S. Government

GeoCommunicator is an official United States Government website. GeoCommunicator is provided by the Bureau of Land Management & the U.S. Forest Service. This is a U.S. Government Computer System. Before continuing, please read this disclaimer and privacy statement.

javascript:// Internet

Publisher Registration



GeoCommunicator - Publisher Registration - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites History Mail Print Edit

Address <http://gnstaging.esri.com/geocom/register.cfm> Go

 **GeoCommunicator**
 Powered by the Geography Network

Home
About
Forum
Reference

[GeoCom Explorer](#)
[Land Manager](#)
[Publish Data](#)
[Contact](#)

Publisher Registration

The GeoCommunicator is a land records community of geographic data providers committed to making geographic content available to others. If you have geographic content, such as maps and data, that you are interested in sharing with others, we invite you to join us as part of the GeoCommunicator.

Join the GeoCommunicator Today!

Becoming a GeoCommunicator publisher is easy. The first step is to register your organization online. You may then publish your geographic content, including map services, map images, data sets, or custom solutions, by providing basic "metadata" information about the content. By registering content, you are acknowledging acceptance of the terms of the **GeoCommunicator Participant Agreement**. For additional details, please visit our overview on [how to participate](#) in the GeoCommunicator.

Register Online Now!

[Already Registered?](#)
[Login to Update Entries](#)

Publisher Note: If you are registered in the ESRI ArcData Guide, you may use that login information for the GeoCommunicator.

<http://gnstaging.esri.com/geocom/register.cfm> Internet

Search and View



GeoCommunicator Explorer - Microsoft Internet Explorer

HOME CONTACT US HELP

GeoCommunicator
Powered by the Geography Network

FIND CONTENT **VIEW CONTENT**

Search Township & Range

DEFINE SEARCH AREA

Find Place for Search

SEARCH

DEFINE SEARCH CRITERIA

Developer Type
All Developer Types

Content Type
All Geographic Content

Data Theme
All Data Themes

Keyword
All Keywords

Date Range
From To

SEARCH

Find and View Geographic Content

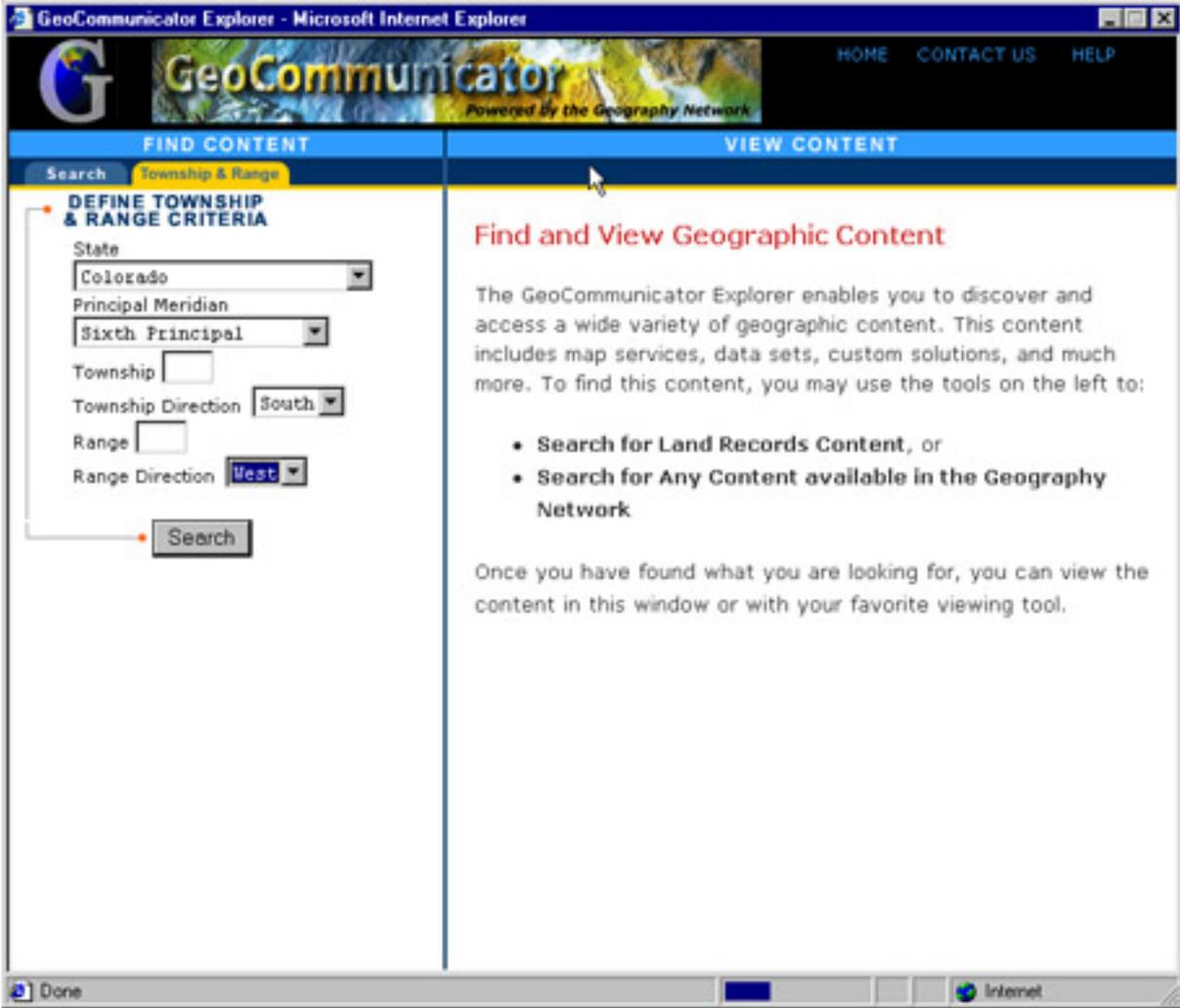
The GeoCommunicator Explorer enables you to discover and access a wide variety of geographic content. This content includes map services, data sets, custom solutions, and much more. To find this content, you may use the tools on the left to:

- Search for Land Records Content, or
- Search for Any Content available in the Geography Network

Once you have found what you are looking for, you can view the content in this window or with your favorite viewing tool.

Done Internet

Township and Range



GeoCommunicator Explorer - Microsoft Internet Explorer

HOME CONTACT US HELP

FIND CONTENT **VIEW CONTENT**

Search **Township & Range**

DEFINE TOWNSHIP & RANGE CRITERIA

State

Principal Meridian

Township

Township Direction

Range

Range Direction

Find and View Geographic Content

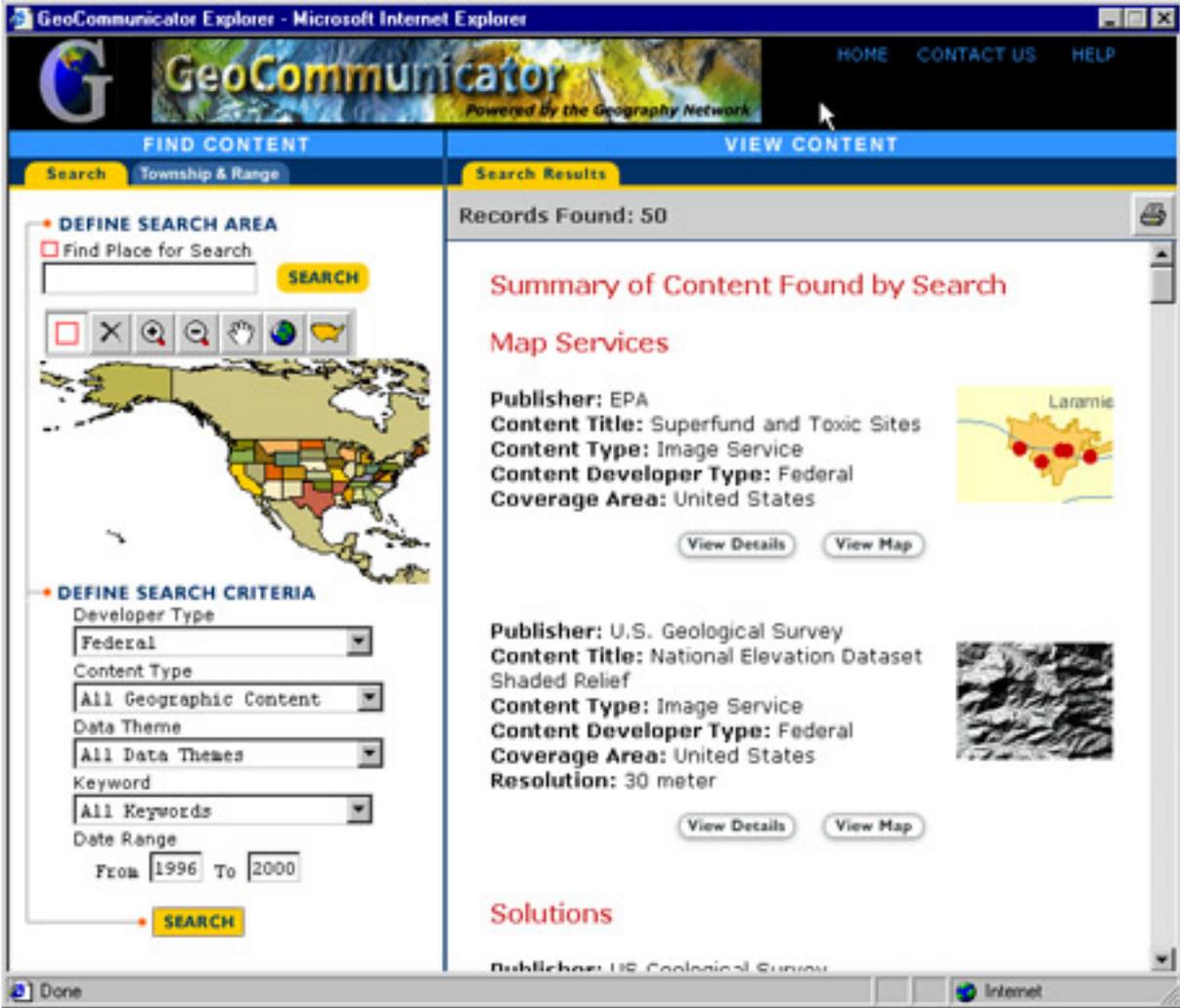
The GeoCommunicator Explorer enables you to discover and access a wide variety of geographic content. This content includes map services, data sets, custom solutions, and much more. To find this content, you may use the tools on the left to:

- Search for Land Records Content, or
- Search for Any Content available in the Geography Network

Once you have found what you are looking for, you can view the content in this window or with your favorite viewing tool.

Done Internet

Search Results



GeoCommunicator Explorer - Microsoft Internet Explorer


GeoCommunicator
Powered by the Geography Network

HOME CONTACT US HELP

FIND CONTENT | **VIEW CONTENT**

Search Township & Range | Search Results

Records Found: 50

DEFINE SEARCH AREA

Find Place for Search

SEARCH

DEFINE SEARCH CRITERIA

Developer Type:

Content Type:

Data Theme:

Keyword:

Date Range: From To

SEARCH

Summary of Content Found by Search

Map Services

Publisher: EPA
Content Title: Superfund and Toxic Sites
Content Type: Image Service
Content Developer Type: Federal
Coverage Area: United States



Publisher: U.S. Geological Survey
Content Title: National Elevation Dataset Shaded Relief
Content Type: Image Service
Content Developer Type: Federal
Coverage Area: United States
Resolution: 30 meter

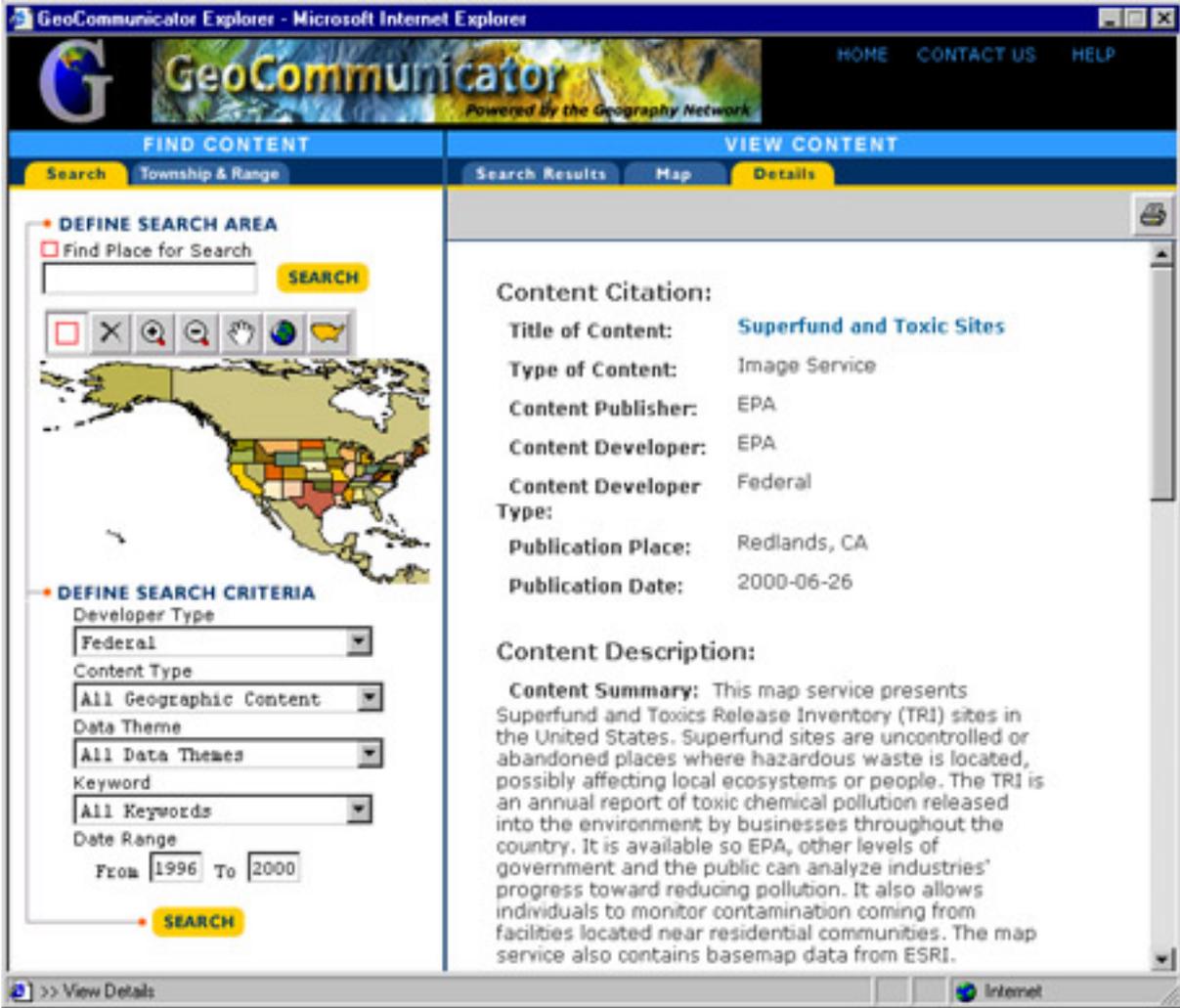


Solutions

Publisher: U.S. Geological Survey

Done | Internet

Search Details



GeoCommunicator Explorer - Microsoft Internet Explorer

HOME CONTACT US HELP

GeoCommunicator
Powered by the Geography Network

FIND CONTENT | **VIEW CONTENT**

Search | Township & Range | Search Results | Map | **Details**

DEFINE SEARCH AREA

Find Place for Search

SEARCH

DEFINE SEARCH CRITERIA

Developer Type:

Content Type:

Data Theme:

Keyword:

Date Range: From To

SEARCH

Content Citation:

Title of Content: [Superfund and Toxic Sites](#)

Type of Content: Image Service

Content Publisher: EPA

Content Developer: EPA

Content Developer Type: Federal

Publication Place: Redlands, CA

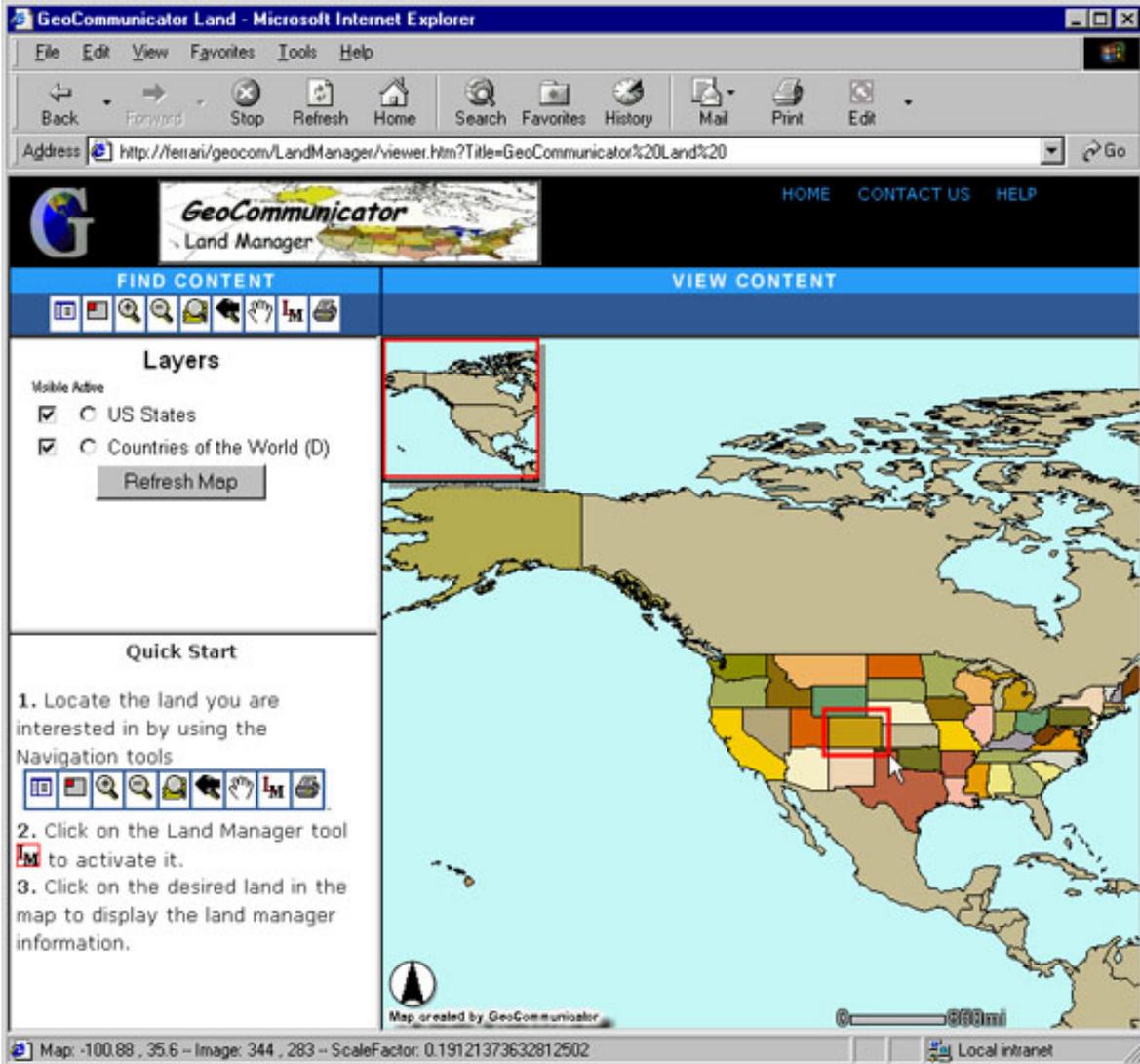
Publication Date: 2000-06-26

Content Description:

Content Summary: This map service presents Superfund and Toxics Release Inventory (TRI) sites in the United States. Superfund sites are uncontrolled or abandoned places where hazardous waste is located, possibly affecting local ecosystems or people. The TRI is an annual report of toxic chemical pollution released into the environment by businesses throughout the country. It is available so EPA, other levels of government and the public can analyze industries' progress toward reducing pollution. It also allows individuals to monitor contamination coming from facilities located near residential communities. The map service also contains basemap data from ESRI.

>> View Details

The Land Manager



GeoCommunicator Land - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites History Mail Print Edit

Address <http://terranet/geocom/LandManager/viewer.htm?Title=GeoCommunicator%20Land%20> Go

GeoCommunicator Land Manager HOME CONTACT US HELP

FIND CONTENT **VIEW CONTENT**

Layers

Mobile Active

US States

Countries of the World (D)

Refresh Map

Quick Start

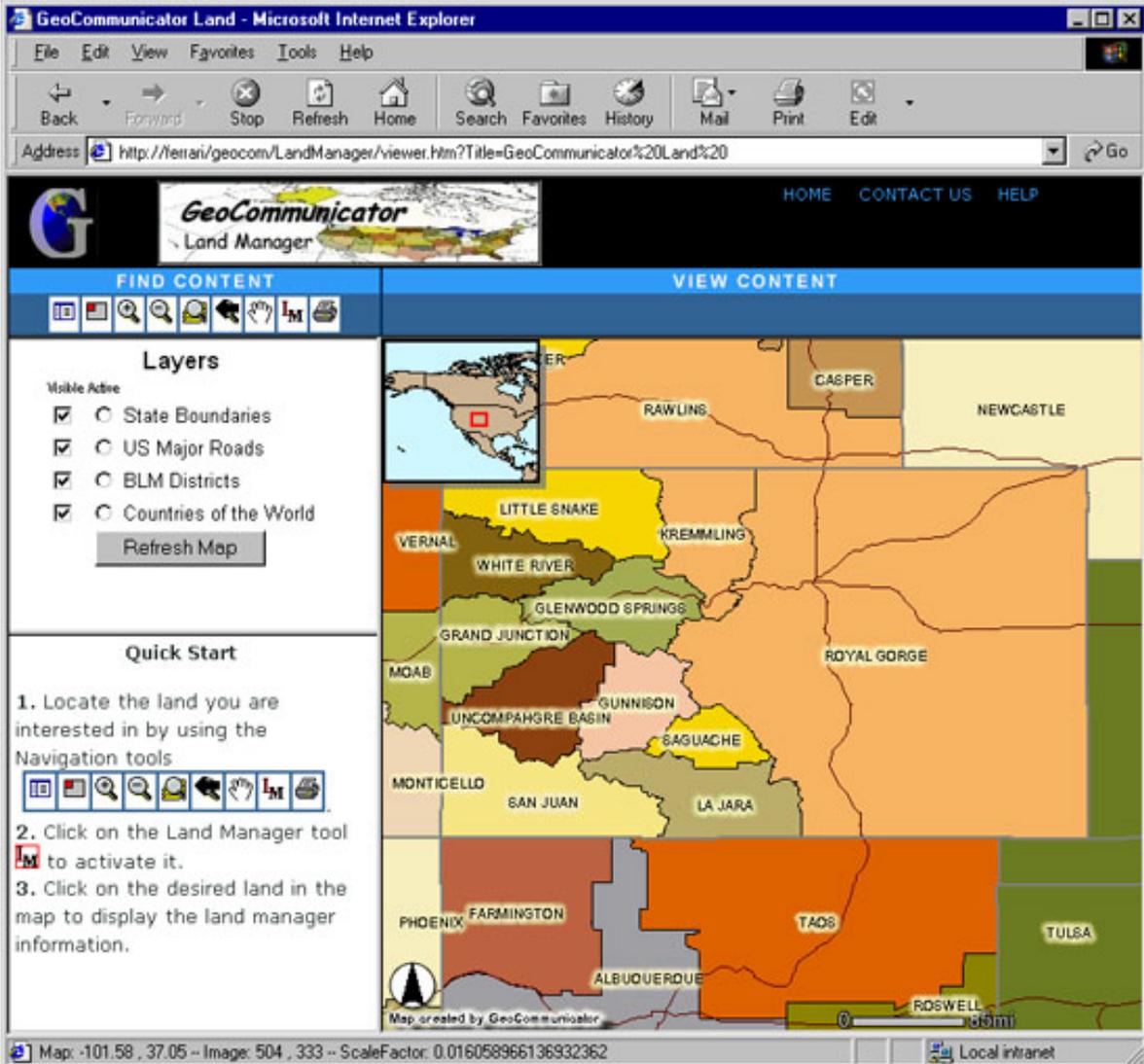
1. Locate the land you are interested in by using the Navigation tools
2. Click on the Land Manager tool  to activate it.
3. Click on the desired land in the map to display the land manager information.

Map created by GeoCommunicator

Map: -100.88, 35.6 - Image: 344, 283 - ScaleFactor: 0.19121373632812502

Local intranet

LM Colorado



GeoCommunicator Land - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites History Mail Print Edit

Address <http://terrari/geoecom/LandManager/viewer.htm?Title=GeoCommunicator%20Land%20> Go

GeoCommunicator
Land Manager

HOME CONTACT US HELP

FIND CONTENT **VIEW CONTENT**

Layers

Make Active

- State Boundaries
- US Major Roads
- BLM Districts
- Countries of the World

Refresh Map

Quick Start

1. Locate the land you are interested in by using the Navigation tools
2. Click on the Land Manager tool  to activate it.
3. Click on the desired land in the map to display the land manager information.

Map created by GeoCommunicator

Map: -101.58 , 37.05 -- Image: 504 , 333 -- ScaleFactor: 0.016058966136932362 Local intranet

LM Gunnison

GeoCommunicator Land - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites History Mail Print Edit

Address <http://terrari/geocom/LandManager/viewer.htm?Title=GeoCommunicator%20Land%20> Go

 **GeoCommunicator**
Land Manager

HOME CONTACT US HELP

FIND CONTENT **VIEW CONTENT**

Layers

Visible Active

- US Cities
- US Places
- State Boundaries
- US Major Roads (L)
- Federal Lands
- Countries of the World

Refresh Map

Name
Gunnison National Forest

Land Type
National Forest FS

Phone
(303) 275-5350

URL
<http://www.fs.fed.us/recreat>

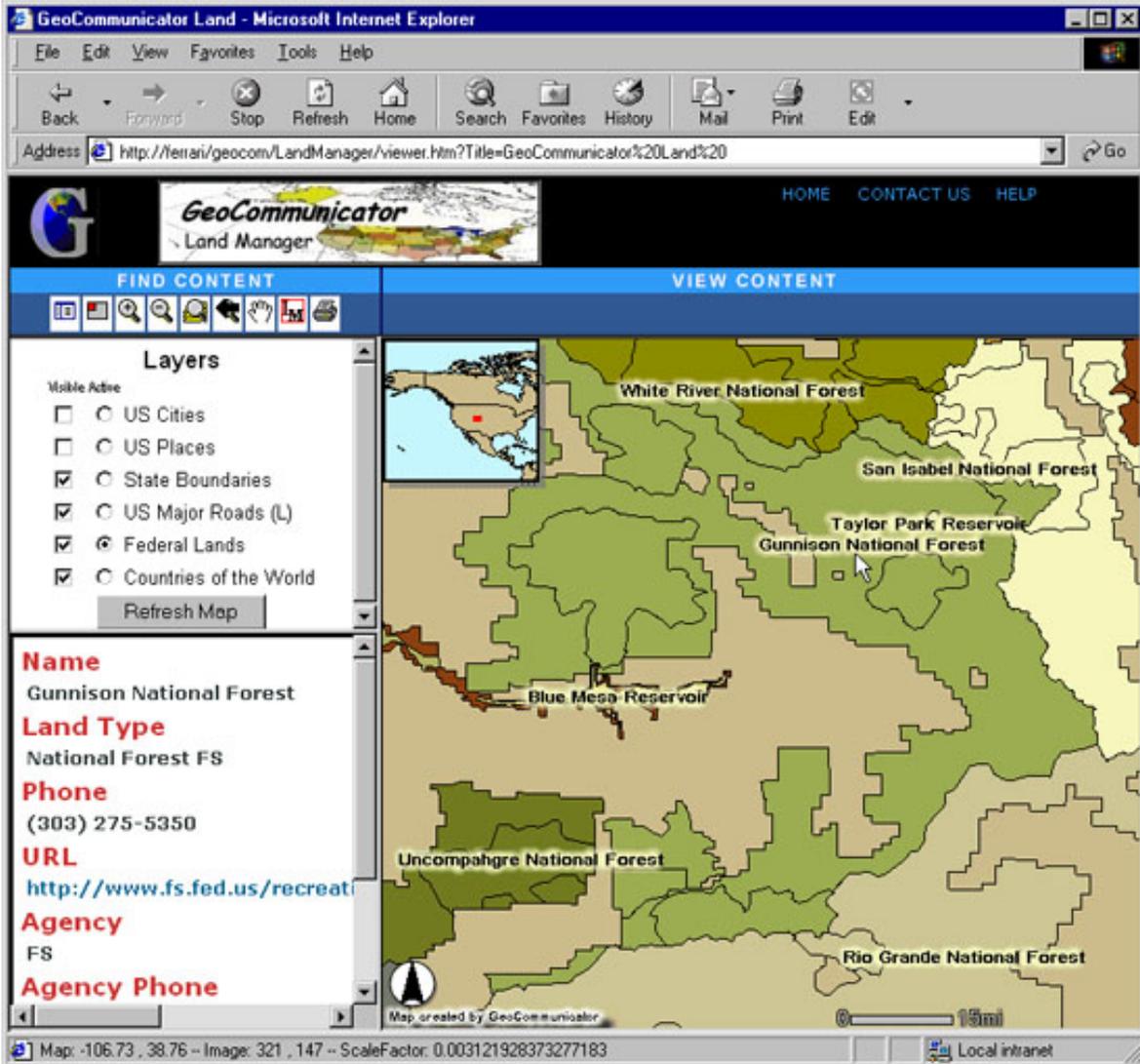
Agency
FS

Agency Phone

Map created by GeoCommunicator

Map: -106.73, 38.76 -- Image: 321, 147 -- ScaleFactor: 0.003121928373277183

Local intranet



NILS Status



- Final Report Available March 2000
(NILES web page)



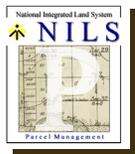
- FY 2001 GeoCommunicator



- FY 2001 / 2002 Survey Management



- FY 2001 / 2002 Measurement Management



- FY 2002 / 2003 Parcel Management

For more information

www.blm.gov/nils

or

303-236-0815