

# MapServer Implementations within Spatial Data Infrastructures (SDI's)

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Sioux Falls, SD

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# Background

- Programmer Analyst
  - USGS / EROS Data Center
- Spatial Data Infrastructure Supported Projects
  - Federal Geographic Data Committee (FGDC)
  - Global Spatial Data Infrastructure (GSDI)
  - USGS / EROS Data Center International Program
  - United Nations Environment Programme (UNEP)

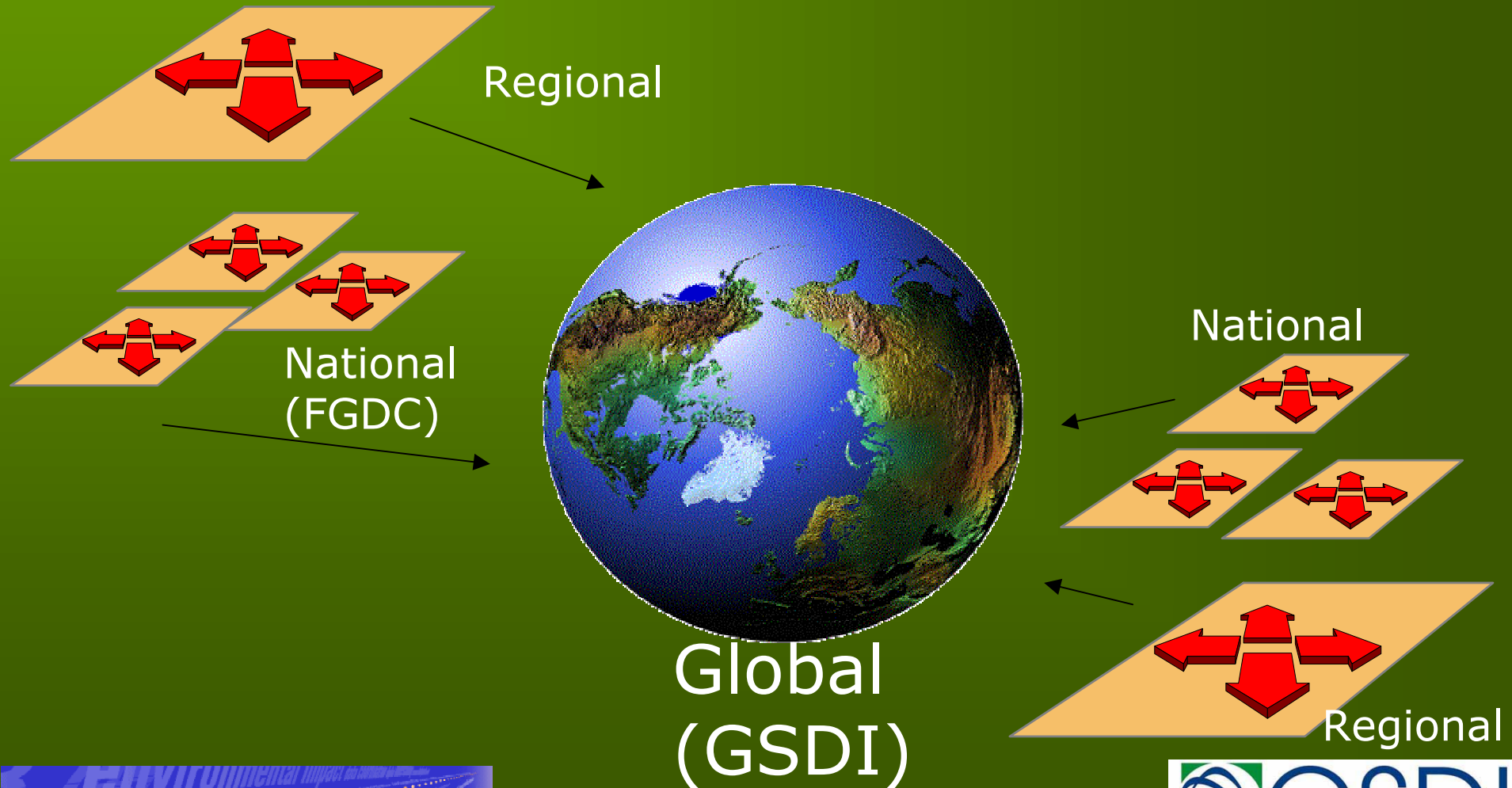
# Overview

- Spatial Data Infrastructures
  - Federal Geographic Data Committee (FGDC)
  - Global Spatial Data Infrastructure (GSDI)
  - Overview
- Implementations
  - Clearinghouse and Metadata
    - Search and Discovery
    - Registration
  - Interoperable Web Mapping
    - 2002 World Summit GISD Pilot Project
  - Clearinghouse, Metadata & Web Mapping Training
    - Workshops
    - Example Implementations

# What is a Spatial Data Infrastructure (SDI)?

- Relevant base collection of technologies, policies and institutional arrangements that facilitate the availability of and access to spatial data.
- It provides a basis for spatial data discovery, evaluation, and application for users and providers within all levels of government, the commercial sector, the non-profit sector, academia and by citizens in general.

# Spatial Data Infrastructures

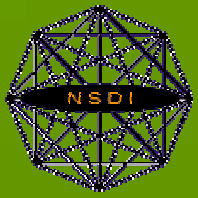


# Global Spatial Data Infrastructure (GSDI)

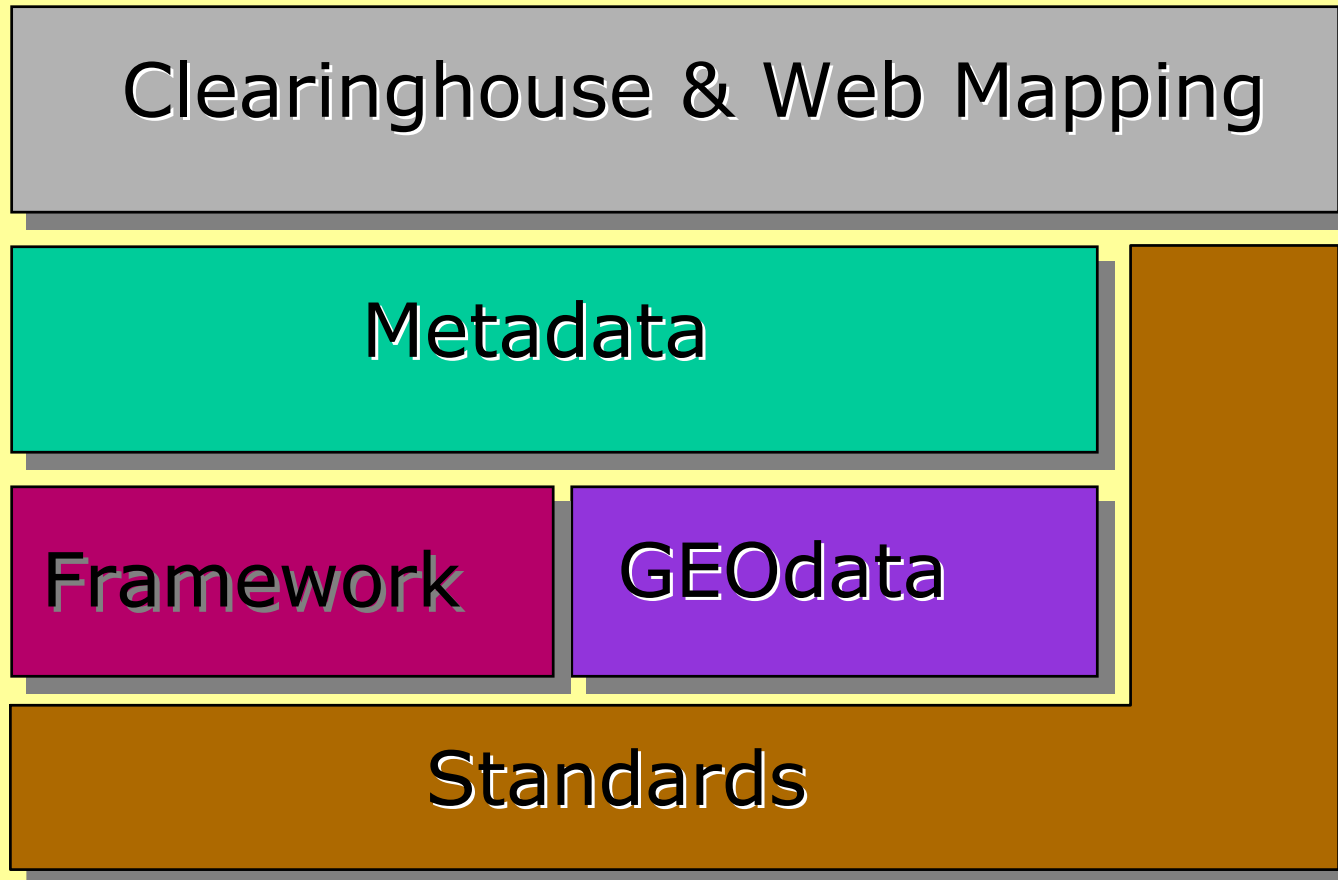
- Non-profit global organization made up of members from more than 50 countries to support ready access to geographic information.
- Coordinated actions of nations and organizations that promote awareness and implementation of:
  - Complementary policies
  - Common standards
  - Effective mechanisms
- Objective: Development and availability of interoperable digital geospatial data and technologies to support decision making at all scales for multiple purposes.

# Federal Geographic Data Committee (FGDC)

- 19 member interagency committee composed of representatives from the Executive Office of the President, Cabinet-level and independent agencies.
- Developing the National Spatial Data Infrastructure (NSDI) in cooperation with organizations from State, local and tribal governments, the academic community, and the private sector.
- Encompasses policies, standards, and procedures for organizations to cooperatively produce and share geographic data.



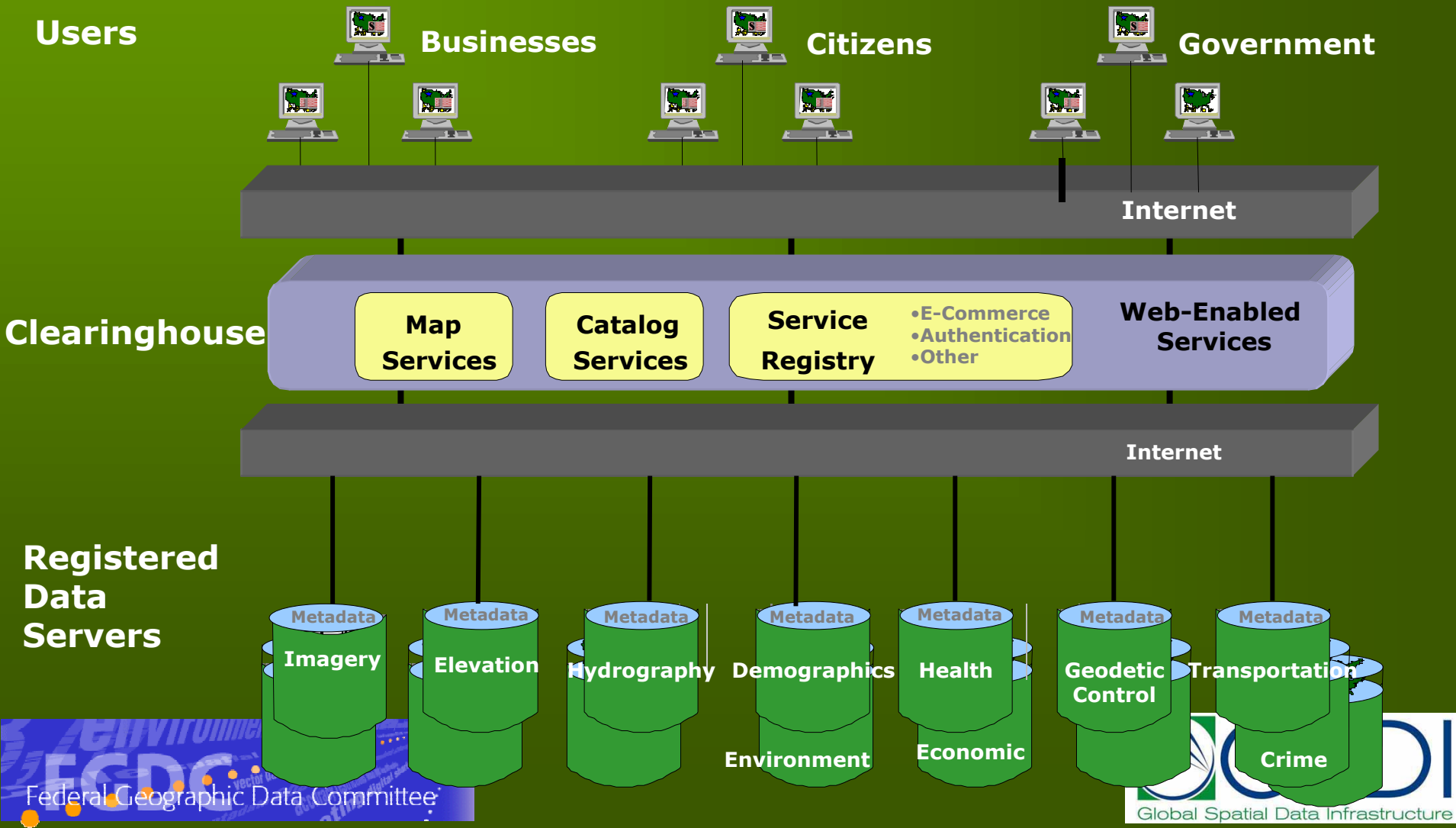
# Core Components of the SDI



*Partnerships*



# Tomorrow: A Global Infrastructure Enabled Through Partnerships, Standards, Technology

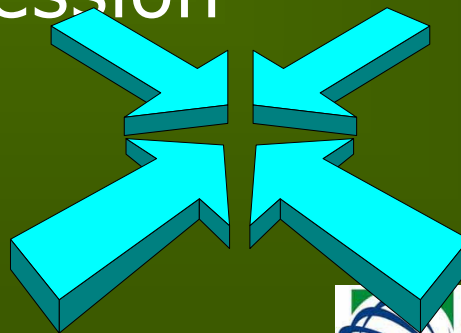


# Clearinghouse & Metadata

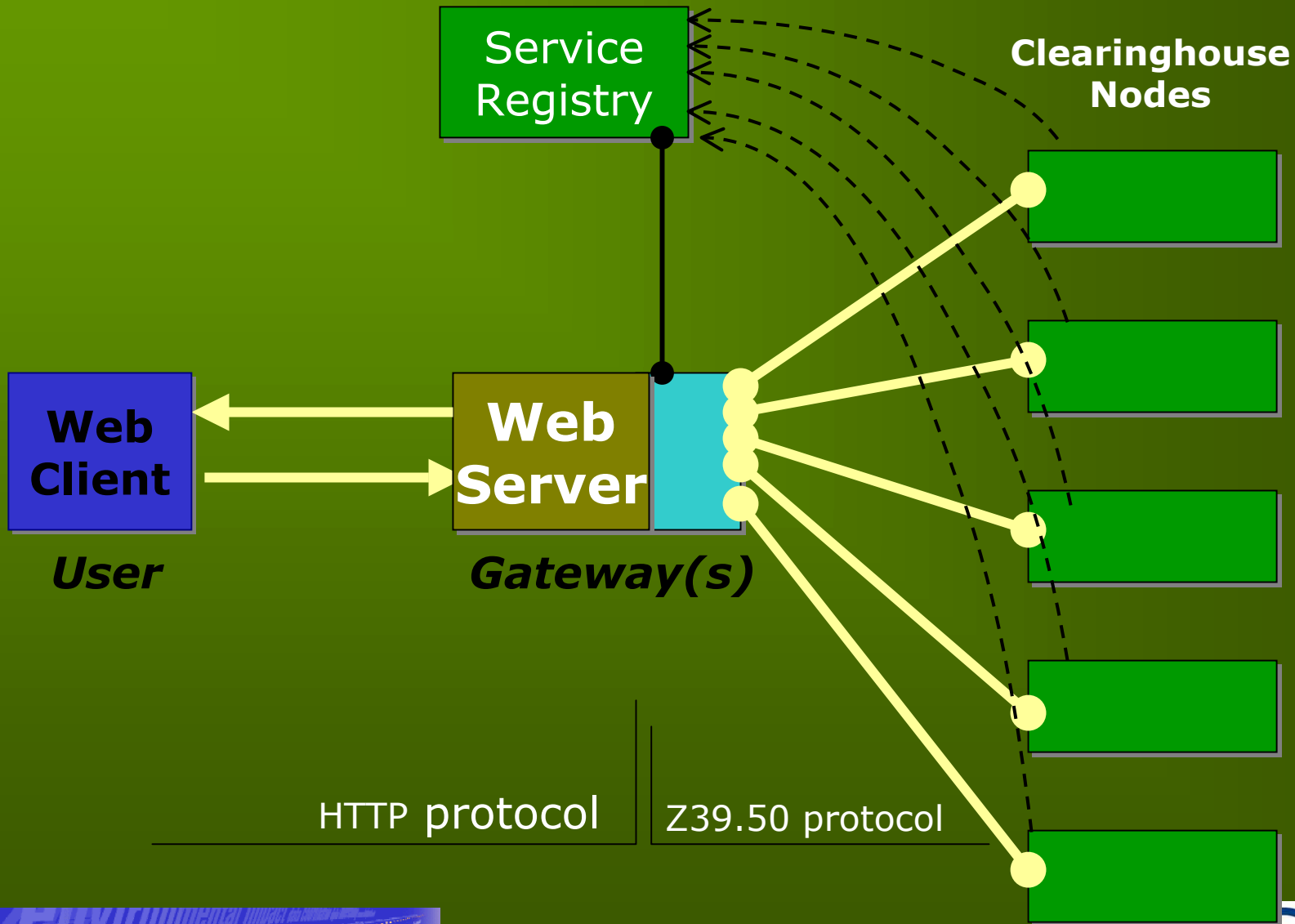
- Search and Discovery via Clearinghouse
- Clearinghouse Registration

# What is Clearinghouse?

- Distributed service to locate geospatial data based on their characteristics expressed in metadata
- Clearinghouse allows one to pose a query of all or a portion of the community in a single session
- Like a spatial AltaVista



# Discovery in Clearinghouse



# National Spatial Data Infrastructure Clearinghouse Search Form

## Define the Geographic Area of Coverage Help...

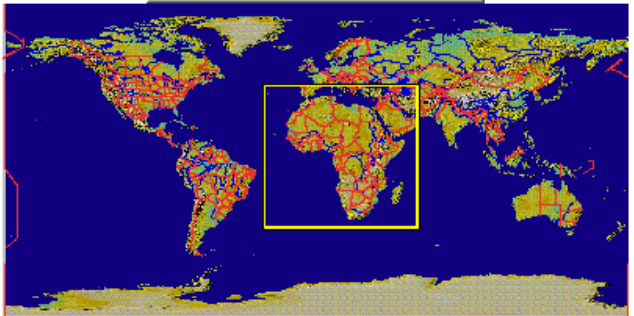
Specify a query region by selecting or entering values

- Don't search based on location       Use coordinates from a place name:

Pick names from:  
 United States  
 International  
place name lists.

Alabama  
Alaska  
Arizona  
Arkansas

Zoom to Selected Place



Enter bounding coordinates:  
If you interact with the map to set coordinates, select this option

North	West	East	South
44.1	-30.599999	59.400000	-39.599999

Zoom to Rectangle      Zoom to Globe

## Specify Time Period of Content Help...

Specify a date or date range for desired spatial data by selecting **one** of the methods below.

- Don't search based on time period
- Get data whose date is before the date May 15 1998
- Get data from Jan 15 1998 through Jun 15 1998

### Search in Full-Text (Any) or by Field Help...

Specify search words by using one or more of the fields below.

Search for:  in the field

in the field

in the field

in the field

### Select Data Servers to Search Help...

Specify the data sources to query and the number of records that will be retrieved from each source.  
Use control key combinations to make multiple selections.

- Find All Data
- Only Find Data With Interactive Web Mapping Services (OGC)

- Map Service Test Node
- UNEP.Net - Sioux Falls Node for UN Environment Programme
- UNEP.Net - Nairobi Node For UN Environment Programme
- UNEP.Net - Geneva Node for UN Environment Programme
- UNEP.Net - World Conservation Monitoring Centre for UN Environment Programme
- UNEP.Net - Arendal Node for UN Environment Programme
- United Nations Cartographic Section
- United Nations Food and Agriculture Organization (FAO)
- CIESIN/NASA - Socioeconomic Data and Applications Center
- National Spatial Information Framework Clearing House Node (South Africa)
- Africa Data Dissemination Service
- Australia - AUSLIG Data Directory
- Canada - RADARSAT Inventory Held by CCRS
- Caribbean Environment Programme
- CEOS International Directory Network

Maximum number of records to show on each results page:

**Done with search!**

*Select the links below to view matches by database.*

Database	Status	# Results
<a href="#">Map Service Test Node</a>	Search Successful	2
<a href="#">UNEP.Net - Sioux Falls Node for UN Environment Programme</a>	Search Successful	14
<a href="#">UNEP.Net - Nairobi Node For UN Environment Programme</a>	Search Successful	2
<a href="#">UNEP.Net - Arendal Node for UN Environment Programme</a>	Search Successful	1
<a href="#">United Nations Cartographic Section</a>	Search Successful	12
<a href="#">United Nations Food and Agriculture Organization (FAO)</a>	Search Successful	11
<a href="#">CIAT GIS Web Server</a>	Search Successful	2
<a href="#">National Spatial Information Framework Clearinghouse Node (South Africa)</a>	Search Successful	1

*Having troubles using this software to find what you need?  
[Click here to send us a message.](#)*

### Brief Metadata Information and Links

You are currently viewing 1-10 out of 14 matches from database 'UNEP.Net - Sioux Falls Node for UN Environment Programme'.

[All](#) [1](#) [2](#) [Next](#)

- Population Density for Africa in 1960 [\[Summary\]](#) [\[Full\]](#)
- Population Density for Africa in 1970 [\[Summary\]](#) [\[Full\]](#)
- Population Density for Africa in 1980 [\[Summary\]](#) [\[Full\]](#)
- Population Density for Africa in 1990 [\[Summary\]](#) [\[Full\]](#)
- Global Forest Cover [\[Summary\]](#) [\[Full\]](#)
- Global Forest Canopy Density [\[Summary\]](#) [\[Full\]](#)
- Satellite image - East Rift 2000 [\[Summary\]](#) [\[Full\]](#)
- Satellite image - East Rift 1973 [\[Summary\]](#) [\[Full\]](#)

Having troubles using this software to find what you need?  
[Click here to send us a message.](#)


<< Back



**Summary Metadata Information**

You are currently viewing record 1 out of 4 from database 'United Nations Environment Programme / GRID - Sioux Falls'.

[Full Next](#)



**Title:** Global Forest Cover  
**Time Period of Content:** 1995-0-00 to 1996-0-00  
**West:** -180.000000 **East:** 180.000000 **North:** 90.000000 **South:** -90.000000  
**Browse Graphic:** <ftp://www.na.unep.net/pub/data/browse/forestd.gif>

*Having troubles using this software to find what you need?  
[Click here to send us a message.](#)*

# Global Forest Cover

Metadata also available as- [Parseable text](#)

## Metadata:

- [Identification Information](#)
- [Spatial Data Organization Information](#)
- [Distribution Information](#)
- [Metadata Reference Information](#)

### Identification Information:

#### Citation:

##### Citation Information:

*Originator:* Zhi-Liang Zhu, USGS

*Publication Date:* 2001

*Title:* Global Forest Cover

*Edition:* the first version

*Geospatial Data Presentation Form:* map

##### Publication Information:

*Publication Place:* Sioux Falls, SD, USA

*Publisher:* USGS, FAO

*Online Linkage:* <http://edcdaac.usgs.gov/glcc/fao/>

##### Online Linkage:

ogc:WMS-1.0.7-http-get-map [http://edcw2ks41.cr.usgs.gov/servlet/com.esri.wms.Esrimap?servicename=wms\\_forest&request=map&WMTVER=1.0.0&BBOX=-180,-90,180,90&WIDTH=600&HEIGHT=400&STYLES=@EXCEPTIONS=INIMAGE&LAYERS=forest.tif&FORMAT=GIF&TRANSPARENT=TRUE&BGCOLOR=0XFF8080](http://edcw2ks41.cr.usgs.gov/servlet/com.esri.wms.Esrimap?servicename=wms_forest&request=map&WMTVER=1.0.0&BBOX=-180,-90,180,90&WIDTH=600&HEIGHT=400&STYLES=@EXCEPTIONS=INIMAGE&LAYERS=forest.tif&FORMAT=GIF&TRANSPARENT=TRUE&BGCOLOR=0XFF8080) [Global Forest Cover]

[View in OGC Map Viewer](#)

### Description:

#### Abstract:

The forest cover map, produced at the U.S. Geological Survey (USGS) EROS Data Center (EDC), has five classes: closed forest, open or fragmented forest, other wooded land, other land cover, and water. The classes were delineated based on circa 1995 monthly AVHRR composite images processed using a hybrid maximum-NDVI and minimum-red compositing technique. Modified mixture analysis, geographic stratification, and other classification techniques were used to estimate forest canopy density within 1 square kilometer pixels, which formed the basis for the first two classes: the closed forest (40%-100% canopy cover), and open or fragmented forest (10-40% canopy cover). The remaining three FAO classes were derived using the USGS global land cover characteristics database as a stratification tool. Validated on the basis of existing reference data sets, the map is estimated to be 77 percent accurate for the first four classes (no reference data were available for water), and 86 percent accurate for the forest and nonforest classification. The global forest map is one of the many outputs produced by FRA 2000. The forest map was produced from the Global Land Cover Characteristics (GLCC) Database, a

# Multi-Server OpenGIS Web Mapping Layers



Out In

Zoom in/out by: 50% Zoom In Zoom Out

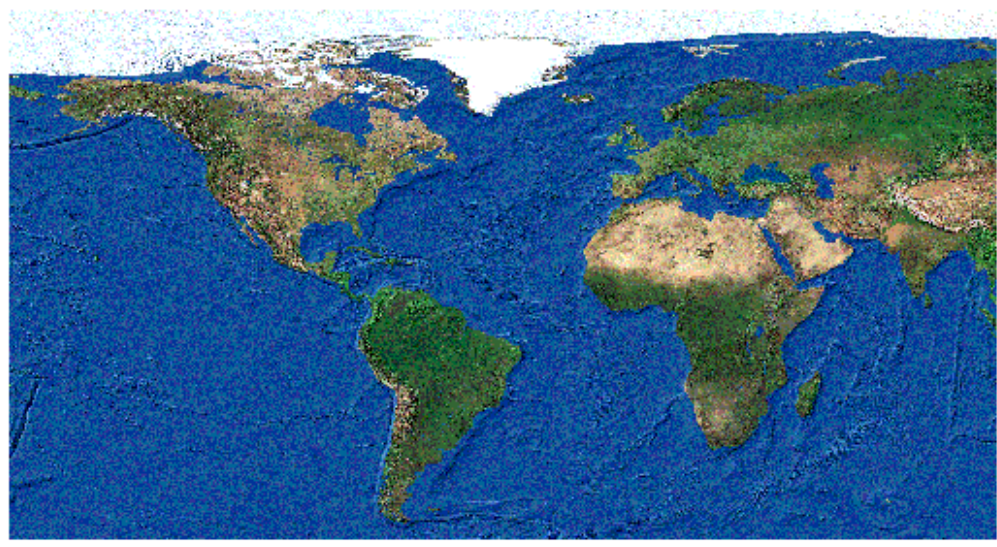
Map Click will:  Zoom In  Zoom Out  Re-Center  Get Feature-Info

Passed Layer (add this layer)  
Global Forest Cover info

get new layer  
Dynamic Layers (0)  
visible active name actions

visible	active	name	actions
<input type="checkbox"/>	<input type="radio"/>	DCW Boundaries 1 ?	↑ ↓
<input type="checkbox"/>	<input type="radio"/>	DCW Roads 1 ?	↑ ↓
<input type="checkbox"/>	<input type="radio"/>	DCW Cities 1 ?	↑ ↓
<input type="checkbox"/>	<input type="radio"/>	GSDI Nodes 1 ?	↑ ↓
<input checked="" type="checkbox"/>	<input type="radio"/>	WSI Shaded Relief 1 ?	↑ ↓

Redraw Map



# Multi-Server OpenGIS Web Mapping Layers



**Out** [Progress bar] **In**

Zoom in/out by: 50% Zoom In Zoom Out

Map Click will:  Zoom In  Zoom Out  Re-Center  Get Feature-Info

Passed Layer (add this layer)  
Global Forest Cover info

get new layer

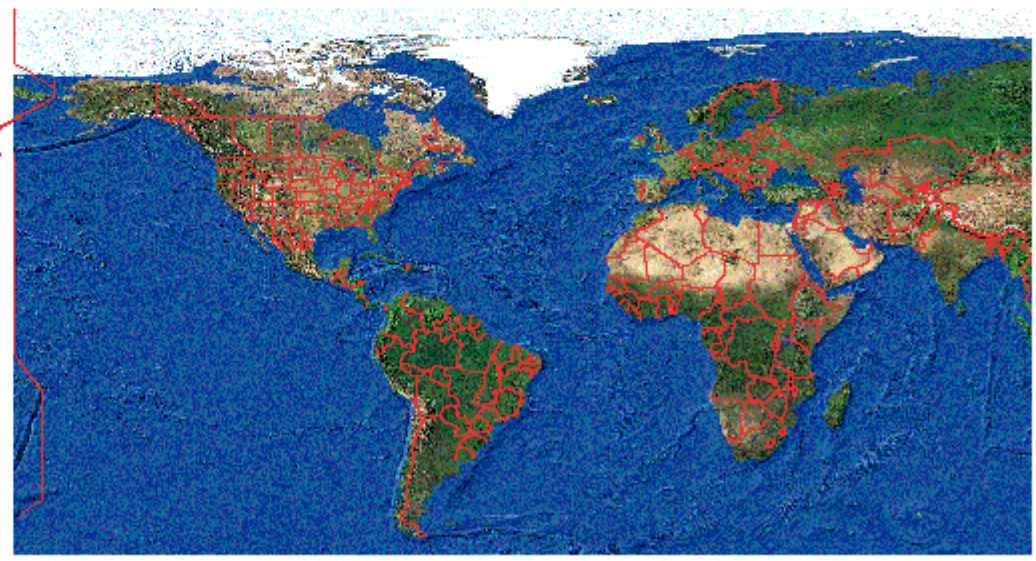
### Dynamic Layers (0)

visible	active	name	actions
---------	--------	------	---------

### Static Layers

visible	active	name	actions
<input checked="" type="checkbox"/>	<input type="radio"/>	DCW Boundaries 1 ?	↑ ↓
<input type="checkbox"/>	<input type="radio"/>	DCW Roads 1 ?	↑ ↓
<input type="checkbox"/>	<input type="radio"/>	DCW Cities 1 ?	↑ ↓
<input type="checkbox"/>	<input type="radio"/>	GSDI Nodes 1 ?	↑ ↓
<input checked="" type="checkbox"/>	<input type="radio"/>	WSI Shaded Relief 1 ?	↑ ↓

Redraw Map



# Multi-Server OpenGIS Web Mapping Layers



Out [Progress bar] In

Zoom in/out by: 50% Zoom In Zoom Out

Map Click will:  Zoom In  Zoom Out  Re-Center  Get Feature-Info

Passed Layer (add this layer)  
[Text input] info

get new layer

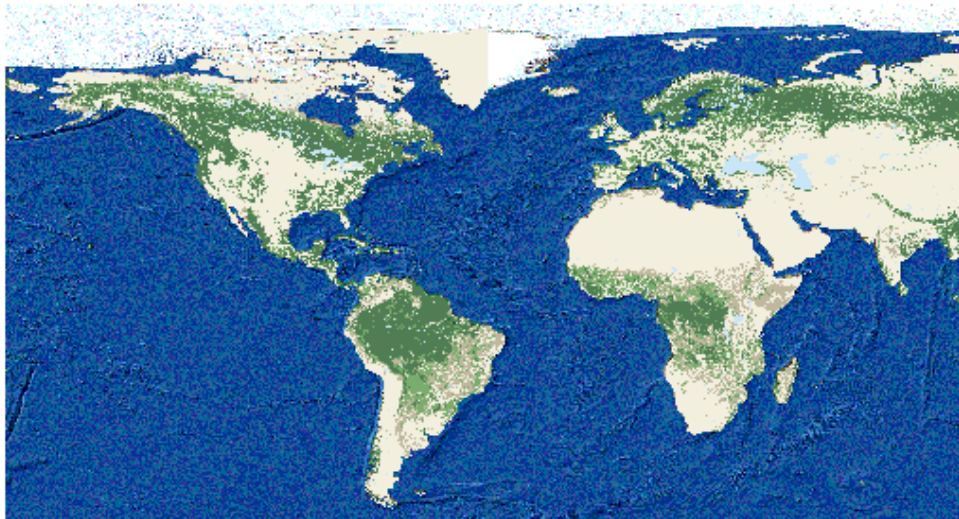
Dynamic Layers (0)

visible	active	name	actions

Static Layers

visible	active	name	actions
<input checked="" type="checkbox"/>	<input type="radio"/>	Global Forest Cover	?
<input type="checkbox"/>	<input type="radio"/>	DCW Boundaries 1	?
<input type="checkbox"/>	<input type="radio"/>	DCW Roads 1 ?	
<input type="checkbox"/>	<input type="radio"/>	DCW Cities 1 ?	
<input type="checkbox"/>	<input type="radio"/>	GSDI Nodes 1 ?	
<input checked="" type="checkbox"/>	<input type="radio"/>	WSI Shaded Relief 1 ?	

Redraw Map



### Brief Metadata Information and Links

You are currently viewing 1-2 out of 2 matches from database 'CIAT GIS Web Server'.

[All 1](#)

Global Cassava Distribution [\[Summary\]](#) [\[Full\]](#)

Climate Regions for Cassava in Africa [\[Summary\]](#) [\[Full\]](#)

*Having troubles using this software to find what you need?* [Click here to send us a message.](#)

# Climate Regions for Cassava in Africa

Metadata also available as -[\[Parseable text\]](#)-[\[SGML\]](#)

## Metadata:

- [Identification Information](#)
- [Spatial Data Organization Information](#)
- [Distribution Information](#)
- [Metadata Reference Information](#)

### Identification Information:

#### Citation:

##### Citation Information:

*Originator:* CIAT-International Center for Tropical Agriculture

*Publication Date:* 20020709

*Title:* Climate Regions for Cassava in Africa

*Edition:* V. 1

*Geospatial Data Presentation Form:* map

##### Publication Information:

*Publication Place:* Cali, Colombia

*Publisher:* CIAT

##### Online Linkage:

ogc:WMS-1.1.1-http-get-map<http://gisweb.ciat.cgiar.org/cgi-bin/mapserv.exe?map=d%3A%2Finetpub%2Fwwwroot%2FMapserver%2Fafrica%2Fedapho.map&WMTVER=1.0.0&REQUEST=map&SRS=EPSG:4326&BBOX=24,-26,50,15&WIDTH=450&HEIGHT=450&LAYERS=yuca&STYLES=reference&FORMAT=GIF> [Edapho-Climatic]

[View in OGC Map Viewer](#)

### Description:

#### Abstract:

This map shows global climate regions for cassava cultivation. Maps were developed separately for Asia, Africa and Latin America based on Carter et al. 1992. The maps were combined into a single map for the tropical and subtropical regions of the world.

The determination of the climate regions is based on mean growing season temperature, number of dry season months, daily temperature range and seasonality.





Satellite image-East Rift 2000 - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites History Print Copy Paste

Address <http://152.61.128.27/servlet/UNEPServlet/retrieve?pn=7&el=F&db=current&rp=3&mr=1&ac=current&cid=27&rsx=HTML> Go Links

Customize Search Sign in My Yahoo! Fantasy Sports Yahoo! Yahoo! Mail Finance News Shopping Travel

# Satellite image-East Rift 2000

Metadata also available as [Parseable text](#)

## Metadata:

- [Identification Information](#)
- [Metadata Reference Information](#)

---

*Identification Information:*

*Citation:*

*Citation Information:*

*Originator:* UNEP

*Publication Date:* 2000

*Title:* Satellite image-East Rift 2000

*Online Linkage:* <http://glervis.usgs.gov>

*Online Linkage:*

ogc:WMS-1.0.7-http-get-map [http://edcw2ks41.cr.usgs.gov/servlet/com.esri.wms.Esrimap?servicename=wms\\_eastrift&request=map&WMTVER=1.0.0&BBOX=36.75,-2.4,34.5,0.95&WIDTH=600&HEIGHT=400&STYLES=&EXCEPTIONS=INIMAGE&LAYERS=Landsat2000Tif&FORMAT=GIF&TRANSPARENT=1](http://edcw2ks41.cr.usgs.gov/servlet/com.esri.wms.Esrimap?servicename=wms_eastrift&request=map&WMTVER=1.0.0&BBOX=36.75,-2.4,34.5,0.95&WIDTH=600&HEIGHT=400&STYLES=&EXCEPTIONS=INIMAGE&LAYERS=Landsat2000Tif&FORMAT=GIF&TRANSPARENT=1)  
[2000 East Rift Valley]

[View in OGC Map Viewer](#)

*Description:*

*Abstract:*

Landsat ETM+satellite image from 12 February 2000 over Eastern Rift Valley in Kenya.

*Purpose:*

Images of Our Changing Environment are being acquired to document and assess changes to the Earth environment visible on satellite images.

*Supplemental Information:*

Both the browse graphic and the map service are displayed with band 4(NIR)in red,band 3(red)in green and band 2(green)in blue. The projection of the browse graphic is UTM zone 36 North and the map service is geographic. The datum is WGS84.

The images for this two scene mosaic were acquired from the USGS EROS Data Center.

Internet

# Multi-Server

## OpenGIS Web Mapping Layers


Out In

Zoom in/out by: 50% Zoom In Zoom Out

Passed Layer (add this layer)

 info

get new layer

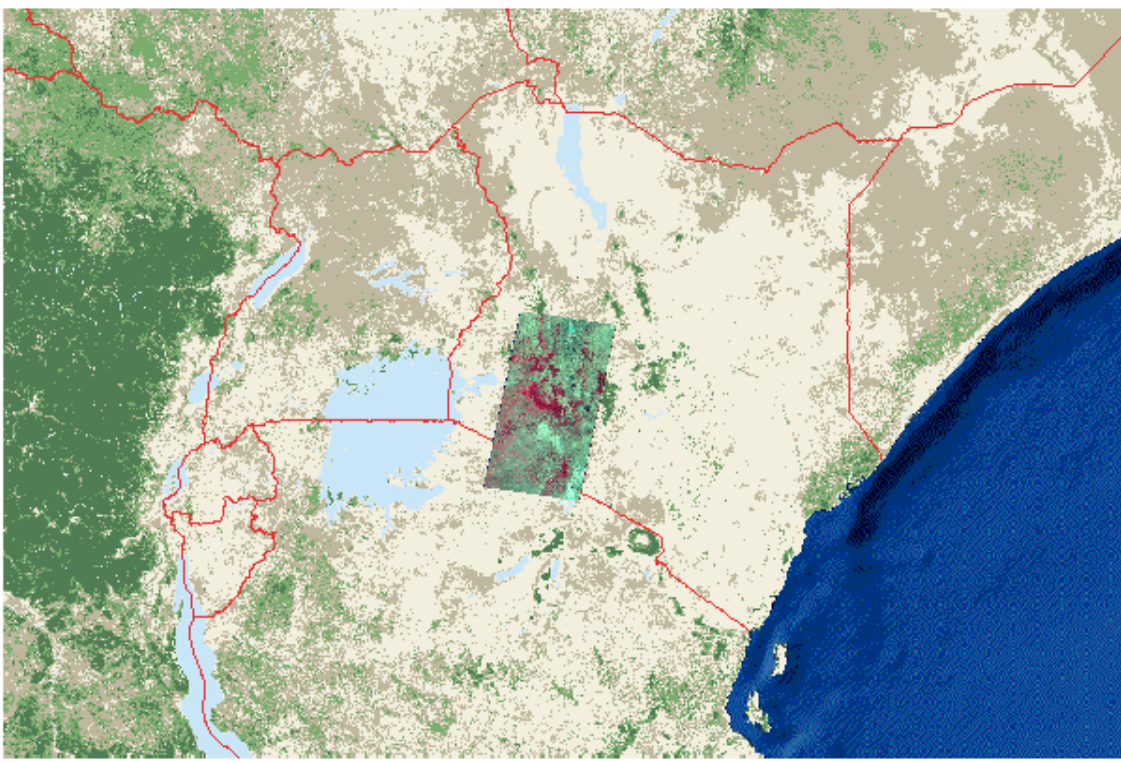
Dynamic Layers (0)

visible	active	name	actions

Static Layers

visible	active	name	actions
<input checked="" type="checkbox"/>	<input type="radio"/>	2000 East Rift Valley ?	▲▼
<input type="checkbox"/>	<input type="radio"/>	UN Second Level Administrative Boundaries,Zambia ?	▲▼
<input checked="" type="checkbox"/>	<input type="radio"/>	DCW Boundaries 1 ?	▲▼
<input type="checkbox"/>	<input type="radio"/>	Edapho-Climatic ?	▲▼
<input checked="" type="checkbox"/>	<input type="radio"/>	Global Forest Cover ?	▲▼
<input type="checkbox"/>	<input type="radio"/>	DCW Roads 1 ?	▲▼
<input checked="" type="checkbox"/>	<input type="radio"/>	DCW Cities 1 ?	▲▼
<input type="checkbox"/>	<input type="radio"/>	GSDI Nodes 1 ?	▲▼
<input checked="" type="checkbox"/>	<input type="radio"/>	WSI Shaded Relief 1 ?	▲▼

Map Click will:  Zoom In  Zoom Out  Re-Center  Get Feature-Info



Redraw Map

**Contributing Organizations**

The following organizations are providing the following Web Mapping Servers. Click on each server name to view the available data source, layer, and server information.

Modify Registration - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media

Address <http://registry.gsd.org/registry/modify.asp> Go

Links Google My Yahoo! for robquenzen Gonzo Customize Links Free Hotmail Mortgage Calculators Windows

Add Your Node Browse Registry Browse Diagnostics Modify Your Node Pending Registrations Home

# THE CLEARINGHOUSE REGISTRY

Federal Geographic Data Committee (FGDC)

## Modify Your Node Information

Use the following form to modify your node information.

### Server Description

Long Title of Server: \*

Short Title of Server: \*

Abstract: \*

Cost:

Server Categories: \*

Agriculture and Farming:	<input checked="" type="checkbox"/>	Atm Clim
Biologic and Ecologic	<input type="checkbox"/>	Env

Modify Registration - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media

Address <http://registry.gsd.org/registry/modify.asp>

Links Google My Yahoo! for robquenzen Gonzo

DB Name: \*

Title Search Word: \*  Valid word

New

Text Search Word: \*  Valid word

New

Perform Spatial Search:  If you do not want a spatial search this option is selected and spatial search is disabled

Platform:

Website URL:

Server Latitude: \*  Decimal D

Server Longitude: \*  Decimal D

Modify Registration - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media

Address <http://130.11.52.184/scripts/mapserv.exe?mode=refer...>

Links Google My Yahoo! for robquenzen Gonzo

### Predominant Geographic Extent of Data Served

min longitude	-26	max longitude	51
min latitude	-35	max latitude	38.301

### Server Contact Information

Name: \*

Organization: \*

Address: \*

City: \*

# Interoperable Web Mapping

- 2002 World Summit GISD Pilot Project
  - Johannesburg, South Africa

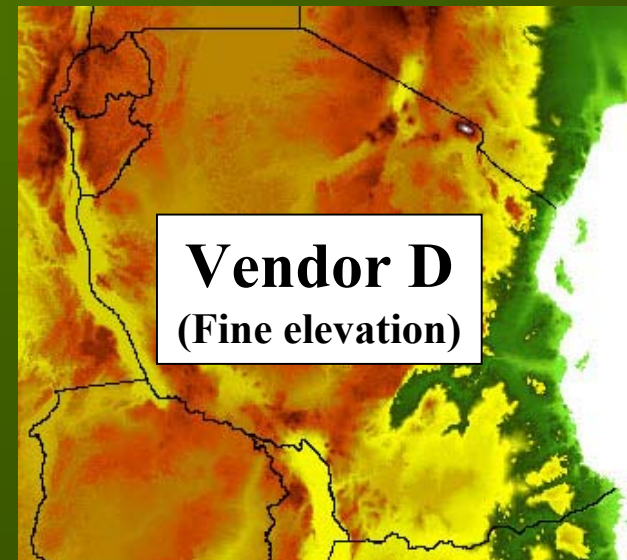
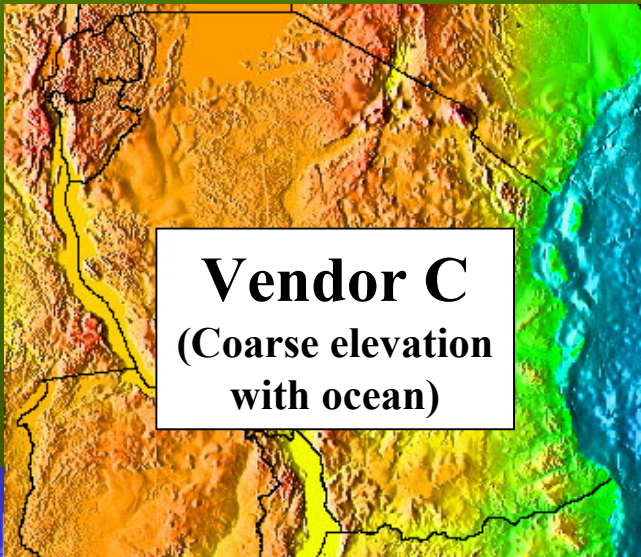
# Geographic Information for Sustainable Development (GISD) Pilot Project - USAID

- Further the benefits of GISD by building and improving the African geospatial information infrastructure
  - Form a public and private partnership to focus both sectors on the issues
  - Create a working, expandable system that is left behind for use by sustainable development practitioners

# Method

- Engage the Open GIS Consortium, Inc. (OGC), to rally its 230 members of the industry around the cause
  - OGC is not-for-profit industry trade association
- Build a framework of existing data resources and enable the real-time sharing and use of those data
  - Uses “interfaces” designed by OGC
  - Uses “software” from industry, government, shareware, open source worlds
    - Clients: FGDC, ATS, ESRI, Cubewerx, Intergraph, Ionic, LaserScan
    - Map Servers: **MapServer**, ESRI, Cubewerx, Intergraph, Ionic, LaserScan

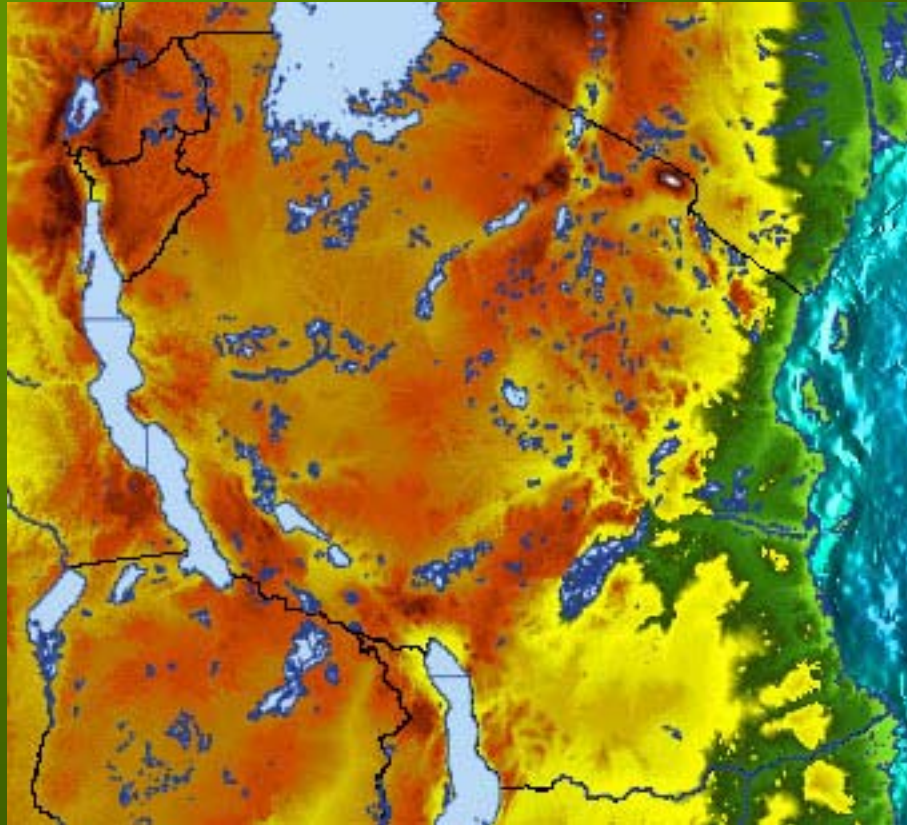
# Before OGC Interfaces



# With OGC Interfaces

**Minutes,  
instead  
of days**

**Up to  
date  
data**



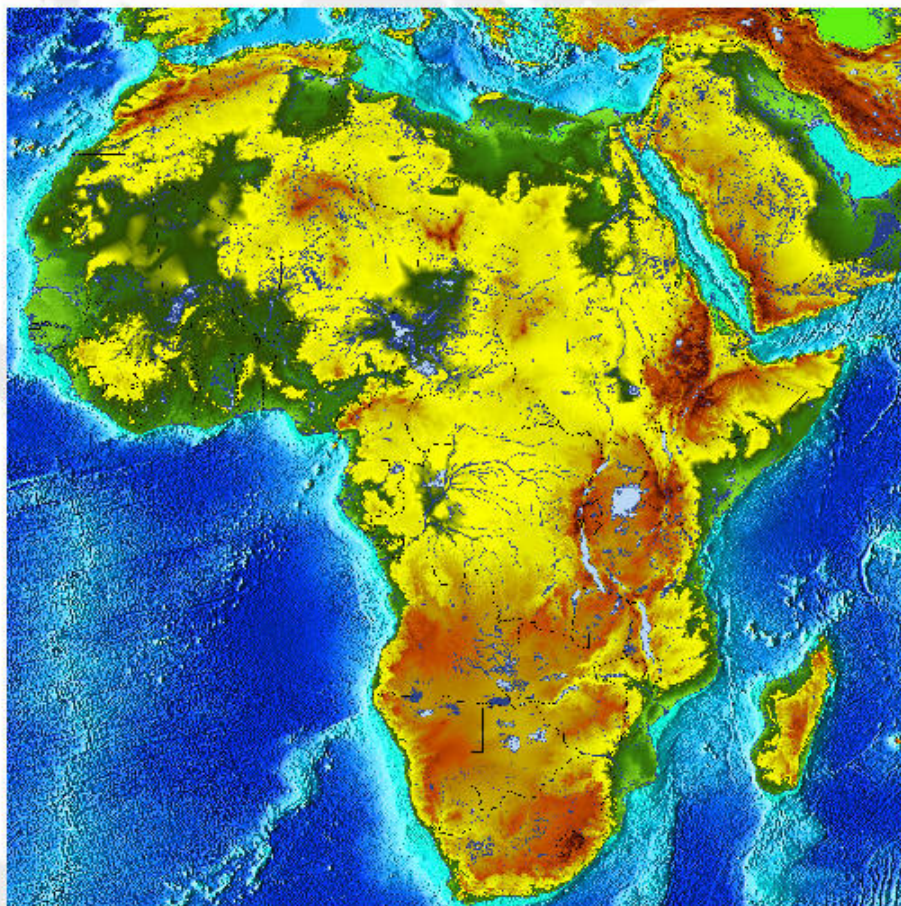
**Vendor  
neutral**

**Format  
neutral**

**Get exactly what you want, not an entire continent**



# GISD OGC PILOT PROJECT DEMONSTRATION



## WMS CLIENTS

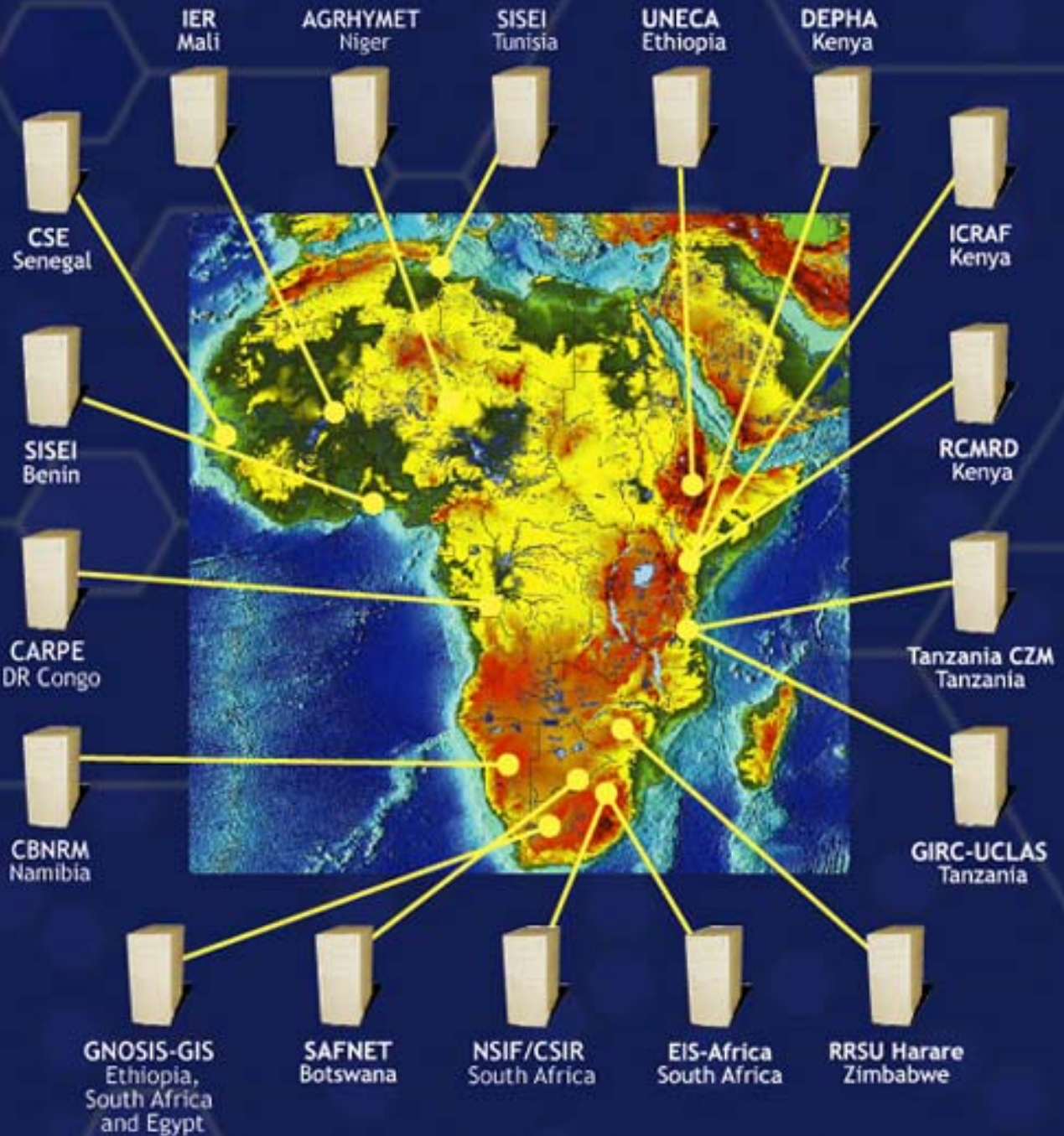
- ATS ROMAP [WMS \(ROMAP\)](#)
- CubeWerx [WMS](#)
- ESRI [WMS](#)
- FGDC with SAIC [WMS \(Multiviewer\)](#)
- Intergraph [WMS / WFS \(GeoMedia\)](#)
- Ionic Software [WMS / WFS](#)
- Laser Scan [WMS / WFS](#)

## SUPPLEMENTAL INFORMATION

- [GSDI Clearinghouse Search Interface](#)
- [Stand Alone Presentation](#)
- [Available Map Services](#)

# Our Phase One African Partners:

More to come in the future





Layers

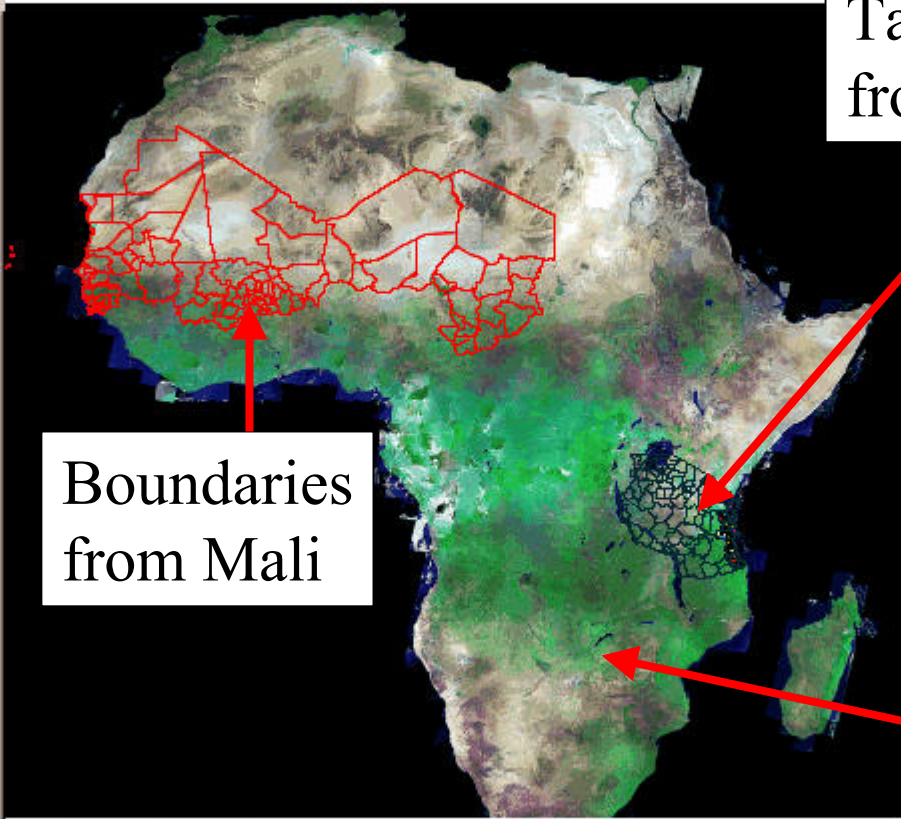
GISD

Contexts



GISD

- FEWS OpenGIS map server
  - African Continental Thema
  - African Continental LANDS
  - West Sahel Cropland Use I
  - Somalia Cropland Use Inte
  - Southern Cropland Use Int
- Ionic WMS Server over Agrhymet
  - Pastoral Areas
  - Level 2 Admin Entities
  - Boundaries
  - Mean start of the agricul
  - African place names
  - Mean length of the agricu
  - Population
  - Weather measure stations
  - Level 4 Admin Entities
  - Level 3 Admin Entities
- Laser-Scan Map Server
- ROMAP SERVER
  - ROMAP SERVER
  - world\_adm0
  - uri\_gisd\_land\_cover
  - uri\_districts
  - county



Boundaries  
from Mali

Tanzania data  
from USA

Image Mosaic  
from Belgium

- Layer List
- 3. Forest\_Classificatio
  - 2. Boundaries
  - 1. Level 2 Admin Entiti
  - 0. African Continental
- Update map

Zoom factor 2x

MinX -23.473052999728154 MinY -32.69521163183727  
MaxX 54.35313052665494 MaxY 45.13097189454582



55.7296,7.8745

Relief and roads  
from USA

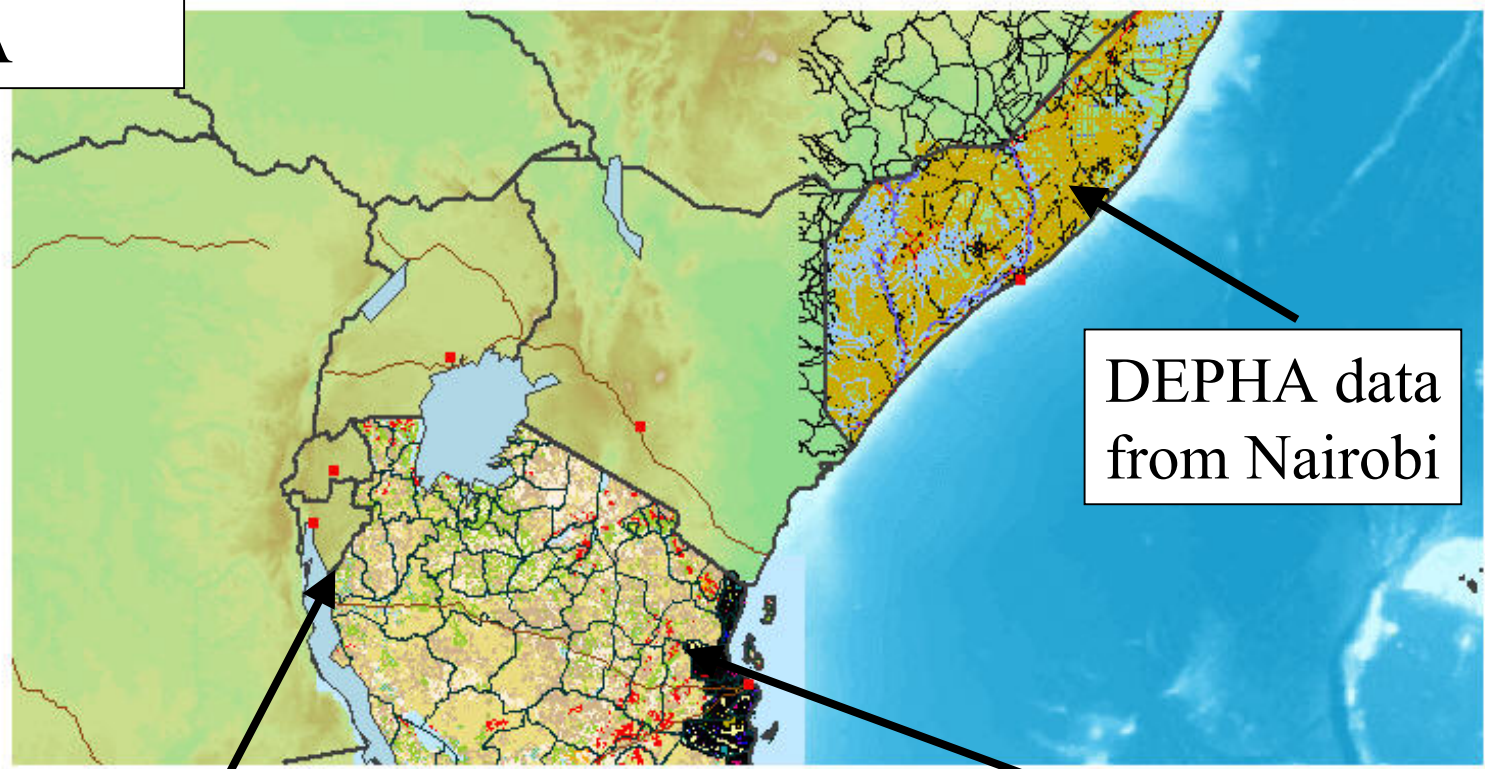
DEPHA data  
from Nairobi

Tanzania Districts  
from USA

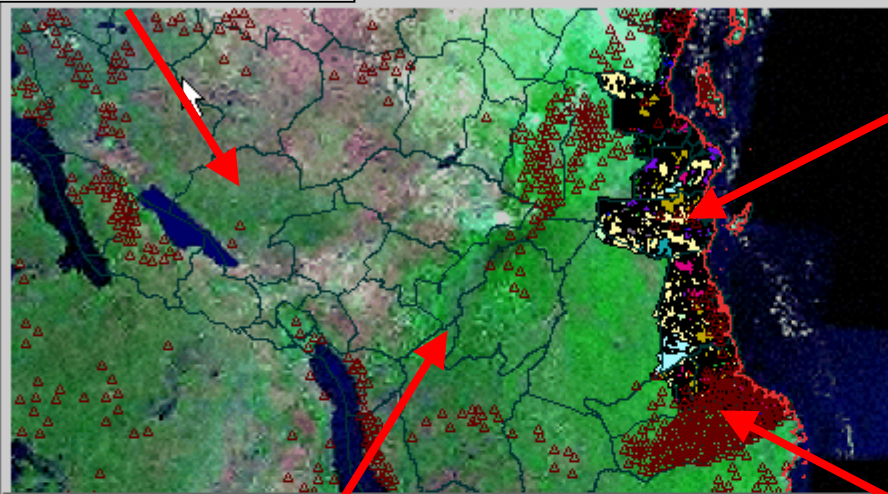
Tanzania Land Cover  
from Dar es Salaam

22.8189,-8.5808

- INTERGRAPH WORLD MAP:**
  - CAPITALS
  - OCEAN LABEL
  - RAILWAY
  - LAKES
  - COUNTRY
- MAPSERVER DEPHA SOMALIA DEMO:**
  - RIVERS
  - ROADS
  - REGIONS
  - DISTRICTS
- ROMAP SERVER:**
  - URI DISTRICTS
  - URI GISD LAND COVER
- SADC LAND COVER MAPSERVER DEMO:**
  - SADC LAND COVER
- DEMIS WORLD MAP SERVER:**
  - TOPOGRAPHY (GRID)
  - COUNTRIES (AREA)
  - OCEAN DEPTH



Earthsat Mosaic  
from USA



Tanzania Land Cover  
from Dar es Salaam

Backdrop from  
this local computer

Tanzania Districts  
from USA

Cassava Cultivation  
from Cali, Colombia

Library Map Layers  On  Off

Add URL Title  URL  Add

Remote Map Layers

Title	Node	Unit	URL	Layer Up	Layer Down	Remove	Refresh View
CIAT GIS web server - Climate Regions for Cassava In...							
UNEP Sioux Falls - Global Forest Cover							
UNEP Sioux Falls - Population Density for Africa in 1990							
ESRI - International Administrative Boundaries							
IGN							
2							
Low Soils							
Hum Soils							
Use Soils							
USGS EDC - FEWS Southern Africa CUI							
UNEP Nairobi - Somalia Schools							
uri districts	Nat. Environment Ma...	190...	Unit... 2.64				
uri gisd land cover	National Environmen...	190...	URL... 18...				
USGS EDC - Earthsat Mosaic							
ICRAF							
ICRAF							
ICRAF							



Boundary data  
From USA

DEPHA data  
from Nairobi

Tanzania Data  
from USA

Roads from USA

MultiViewer  
OpenGIS Web Mapping  
Layers

Passed Layer (add this layer)  
info

get new layer

Dynamic Layers (3)

visible	active	name	actions
<input checked="" type="checkbox"/>	<input type="radio"/>	regions ?	▲ ▼ ✕
<input checked="" type="checkbox"/>	<input type="radio"/>	districts ?	▲ ▼ ✕
<input checked="" type="checkbox"/>	<input type="radio"/>	SADC Land Cover ?	▲ ▼ ✕

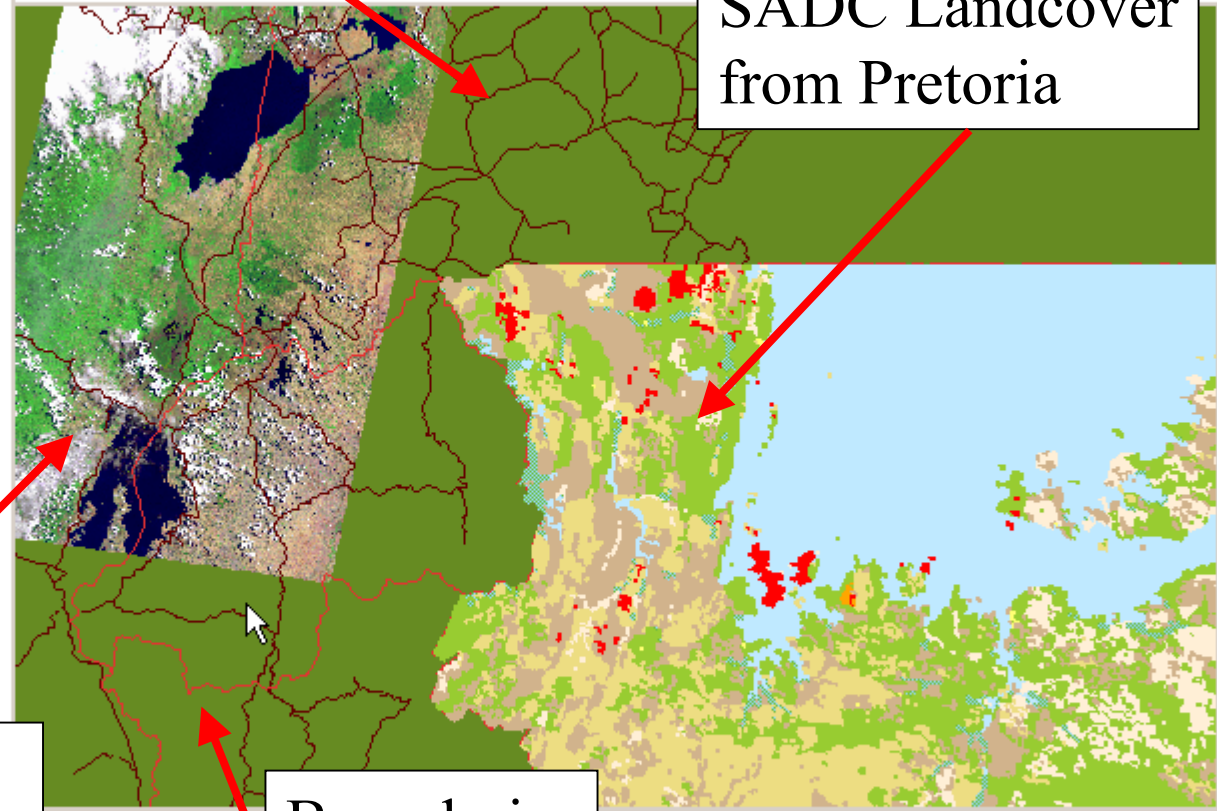
Static Layers

visible	active	name	actions
<input checked="" type="checkbox"/>	<input type="radio"/>	DCW Boundaries ?	▲ ▼
<input checked="" type="checkbox"/>	<input type="radio"/>	DCW Roads ?	▲ ▼
<input type="checkbox"/>	<input type="radio"/>	DCW Cities ?	▲ ▼
<input type="checkbox"/>	<input type="radio"/>	GSDI Nodes ?	▲ ▼
<input checked="" type="checkbox"/>	<input type="radio"/>	CEOS Landsat 7 Image - Niger Basin ?	▲ ▼
<input checked="" type="checkbox"/>	<input type="radio"/>	WSI Shaded Relief	▲

zoom in/out by: 100% Zoom In Zoom Out

Map Click will:  Zoom In  Zoom Out  Re-Center  G

SADC Landcover from Pretoria



CEOS Landsat Mosaic from USA

Boundaries from USA

x=45.0160, y=-3.5256

Shaded relief  
from Canada







Tanzania Data  
from Dar es Salaam

Cassava data  
from Colombia



[Help](#)

Legend:

-  gisd\_land\_cover
-  Cassava Distribution
-  Coastlines
-  Political Boundaries
-  [Global 30 Second Elevations](#)
-  [Two Minute Shaded Relief](#)

x=32.7540, y=-12.9579

zoom in    zoom out    recenter

query on: (none) within 3 pixels, max features: 5



# Benefits

- Lower cost to obtain and use mapping data means more dollars can be spent on the 'science' needed to solve the challenges
- Data are always current, unlike file transfer system today where updates are often lost
- New science is enabled by easy interchange of resulting data

# Clearinghouse, Metadata & Web Mapping Training

- Workshops
- Example Implementations

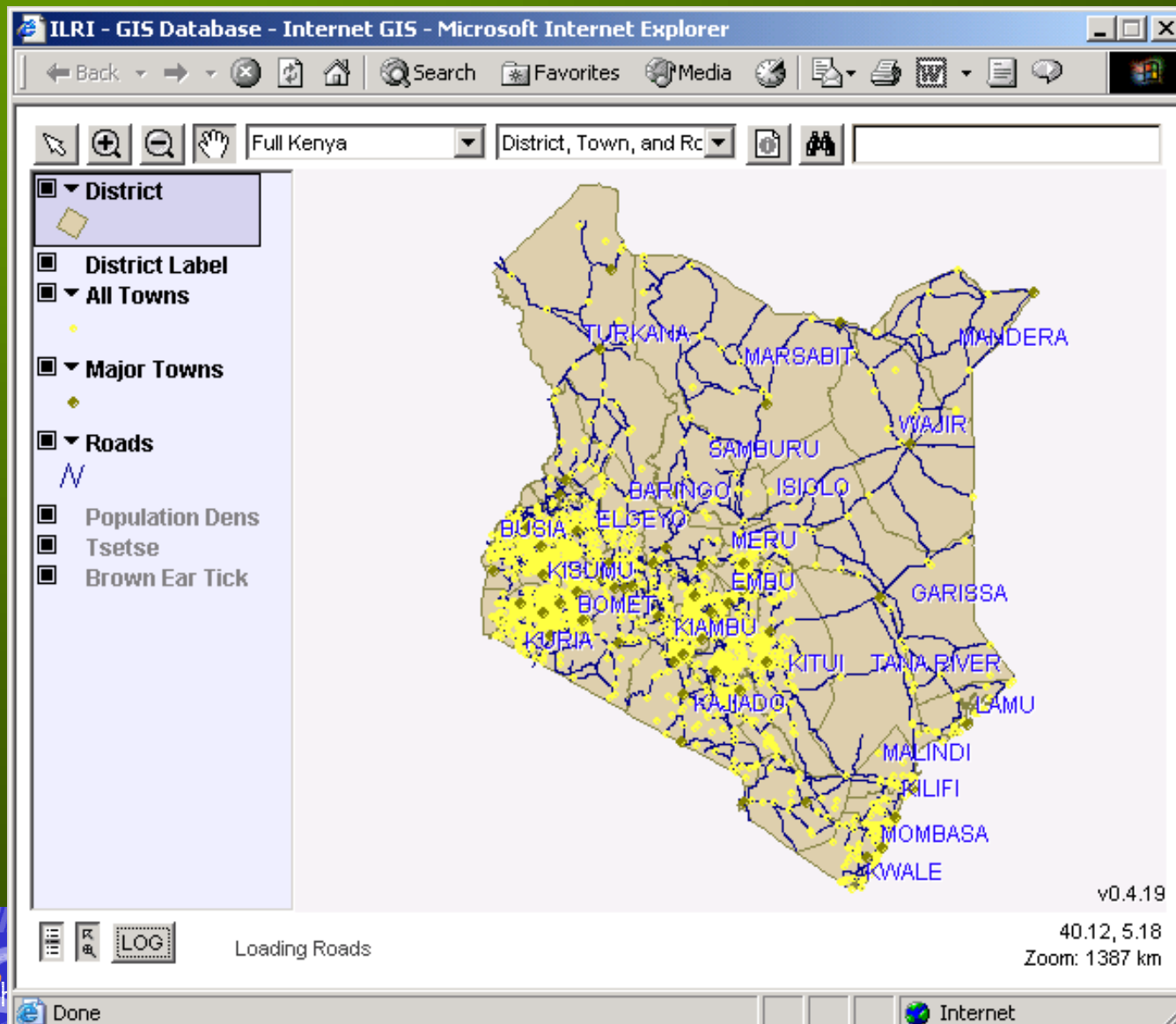
# Capacity Building & Training

- SDI Workshops
  - Provide open source and commercial options
  - Use open source software during hands on learning
    - No cost option; great for developing countries / counties
- Web Mapping
  - Standalone applications
  - OpenGIS Map Services
  - Clearinghouse-Metadata-Web Mapping Integration
- Workshops
  - GASSIA Workshop, USGS-EDC June 2002
  - Addis Ababa, Ethiopia Oct 2002
  - Harare, Zimbabwe Sep 2003
  - Gaborone, Botswana May 2003
  - Lusaka, Zambia May 2003
  - Malawi Aug 2003

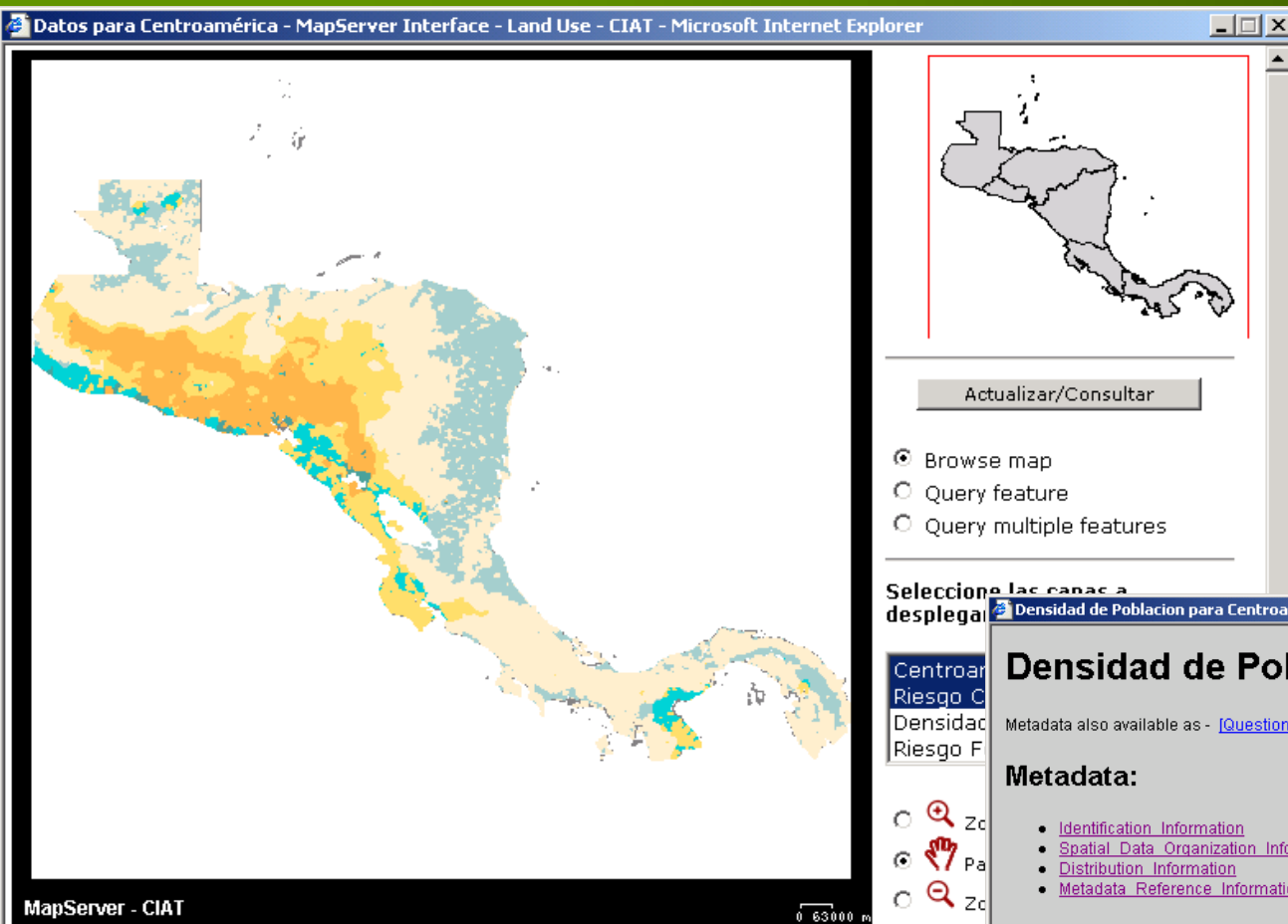
# Clearinghouse, Metadata and Web Mapping SDI Workshop Agenda

DAY ONE	DAY TWO	DAY THREE
Overview	FGDC and ISO Metadata Standards	Clearinghouse and Web Mapping
SDI Components	Metadata Development	MapServer Overview
Metadata	Metadata Validation	MapServer Installation

# Example Implementations: International Livestock Research Institute ILRI



# Example Implementations: Centro Internacional de Agricultura CIAT – Cali, Colombia



Densidad de Poblacion para Centroamerica - Microsoft Internet Explorer

## Densidad de Poblacion para Centroamerica

Metadata also available as - [\[Questions & Answers\]](#) - [\[Parseable text\]](#)

**Metadata:**

- [Identification Information](#)
- [Spatial Data Organization Information](#)
- [Distribution Information](#)
- [Metadata Reference Information](#)

---

*Identification\_Information:*  
*Citation:*  
*Citation\_Information:*  
 Originator: Centro Internacional de Agricultura Tropical - CIAT  
 Publication\_Date: 20001109  
 Title: Densidad de Poblacion para Centroamerica  
 Edition: V.1  
 Geospatial\_Data\_Presentation\_Form: map  
 Publication\_Information:

**Metadatos**

Densidad de Población/Population Density	Download
Riesgo Climático/Climate Risk	Order
Riesgo Forestal/Forestry Risk	Order
Riesgo Costero/Coastal Risk	Order
Indice de Accesibilidad/Accessibility Index	Order

**Legenda**

	< 3 c
	4-6 c
	> 6 c
	< 3 c

# Example Implementations: United Nations Environment Programme UNEP – Nairobi, Kenya

File Edit View Favorites Tools Help

Address <http://mms.unep.org/cgi-bin/mapserv?map=%2Fvar%2Fwww%2Fmms%2Fdepha%2Fsomalia.map&layer=boundaries&layer=settlements&layer=airport&zoomsize=2&...>

## DEPHA-Somalia MapServer

[Main menu](#)

Refresh/Query

Browse map  
 Get information  
 Query multiple features

Select Layers to Display:

- Regions
- Districts
- Roads
- Settlements
- Airport

Zoom In  Recentre  Zoom Out

Zoom Size

**Legend**

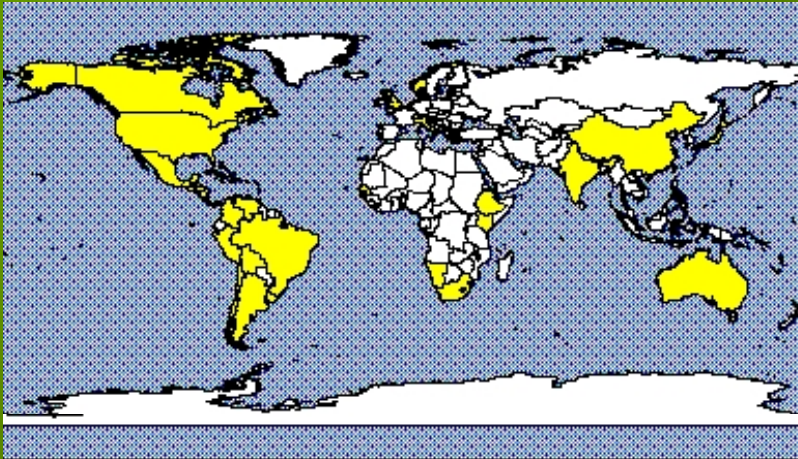
- Village
- Town
- District Centre
- Capital - Regional, National
- ∕ National border
- ∕ Regions
- ∕ Districts

Powered by MapServer

0 168 320 km

Done Internet

# Global Clearinghouse Nodes



Argentina	1
Australia	19
Barbados	2
Bolivia	1
Brazil	4
Canada	17 *
Chile	1
China	1
Colombia	2
Costa Rica	3
Dominica	1
Dominican Republic	1

El Salvador	2
Ethiopia	3
Guatemala	3
Honduras	2
India	1
Italy	2
Japan	2
Jamaica	1
Kenya	4
Mexico	3
Namibia	1
Nicaragua	2
Norway	1
Peru	1
South Africa	3
Senegal	1
Switzerland	1
Trinidad & Tobago	1
United Kingdom	10
United States	200
Uruguay	2
Venezuela	2



# SDI Implementation Guide

Developing Spatial Data Infrastructures:

## The SDI Cookbook

Version 1.0

6 July 2000

Release for Review at the Fourth Global Spatial Data  
Infrastructure South Africa



Editor: Douglas D. Nebert, Technical Working Group Chair, GSDI

*Disclaimer: This draft represents a work-in-progress that has been compiled from numerous contributions and available online documents contributing organisations. Full acknowledgement of contributions and citations will be provided in the initial public draft.*

- Internationally developed document to help grow globally compatible SDI's

- Chapters

- Geodata Development
- Geodata Cataloging or Clearinghouse
- Visualization and Access (Web Mapping)
- Metadata and Standards
- Supporting Case Studies
- Outreach and Capacity Building
- Other Services

- Available at <http://www.gsd.org>

# For More Information

- Michelle Anthony
  - [Anthony@usgs.gov](mailto:Anthony@usgs.gov)
- GSDI
  - <http://www.gsdi.org>
- FGDC
  - <http://www.fgdc.gov>
- OpenGIS
  - <http://www.opengis.org>