

NRCS NCGC

Geospatial Data Support

State Soil Scientist Meeting
March 19, 2008

Sam Brown

Soil Geodatabases Team Leader

National Cartography & Geospatial Center

Fort Worth, Texas

NCGC Soil Survey Support

The **NCGC Partnership** with the Soil Survey Program includes providing:

- **Geospatial Data**
- **Geospatial Technology**
- **Geospatial Services**

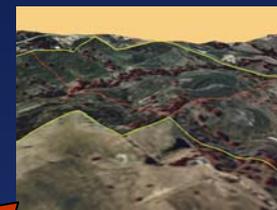
Elevation Data, Satellite Imagery, NAIP 2008, and NCGC Geospatial Web Map Service

- NRCS supports a **multi-resolution and sensor approach** to creating elevation for the nation
- NRCS currently use **Elevation Data from 30 and 10 meter NED, IFSAR 5 meter and LIDAR < 3 meter products**
- NRCS need for **standards, specifications and contract vehicles** to purchase elevation products in FY2008 and beyond

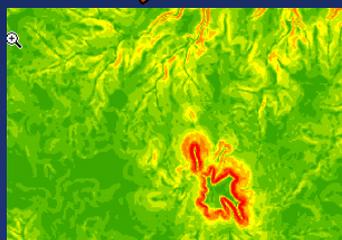


Terrain Modeling

What are our
elevation
requirements?



Analysis



Visualization



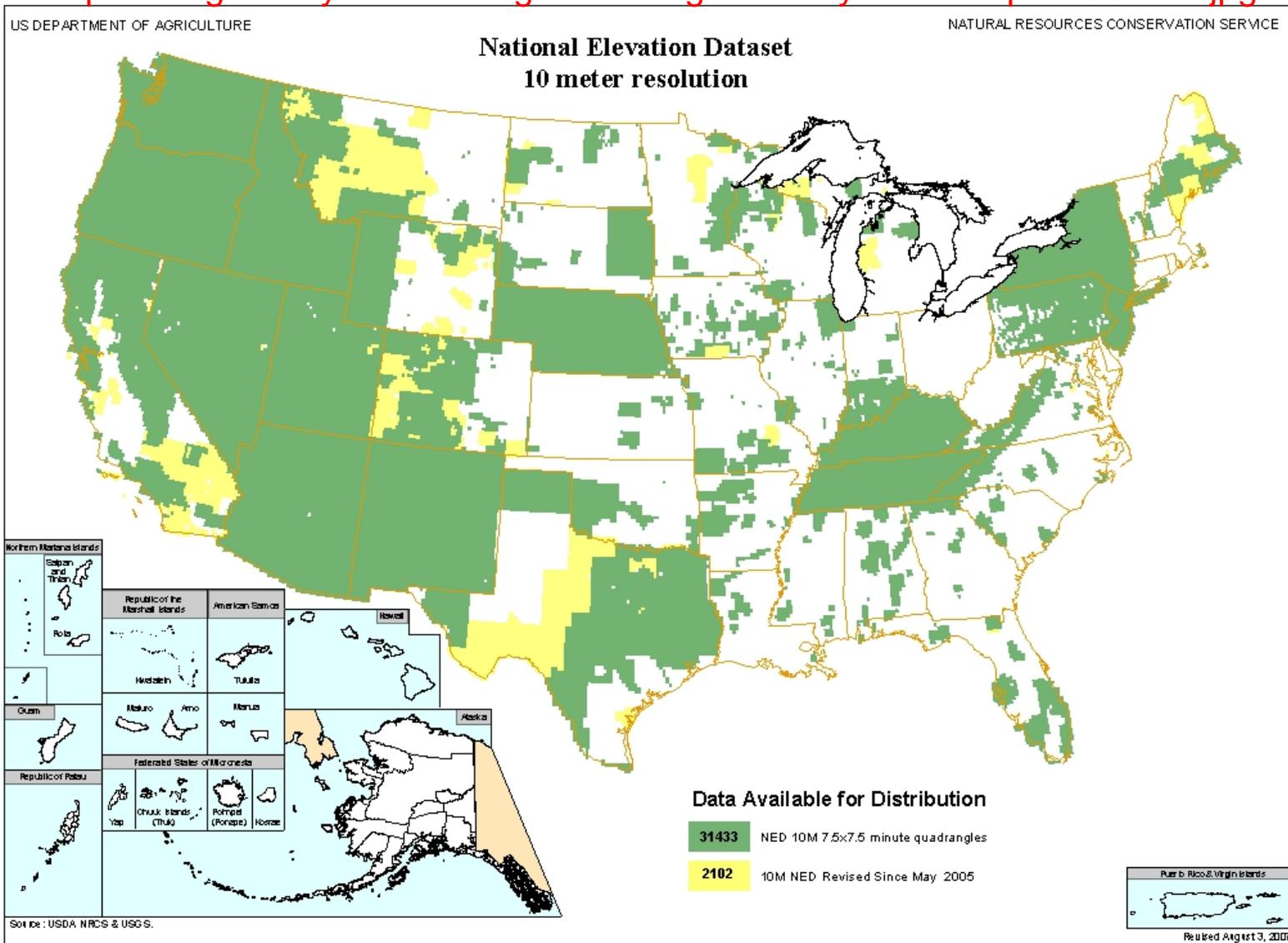
DEM



Reality



<http://datagateway.nrcs.usda.gov/Catalog/GatewayStatusMaps/NED10M.jpg>

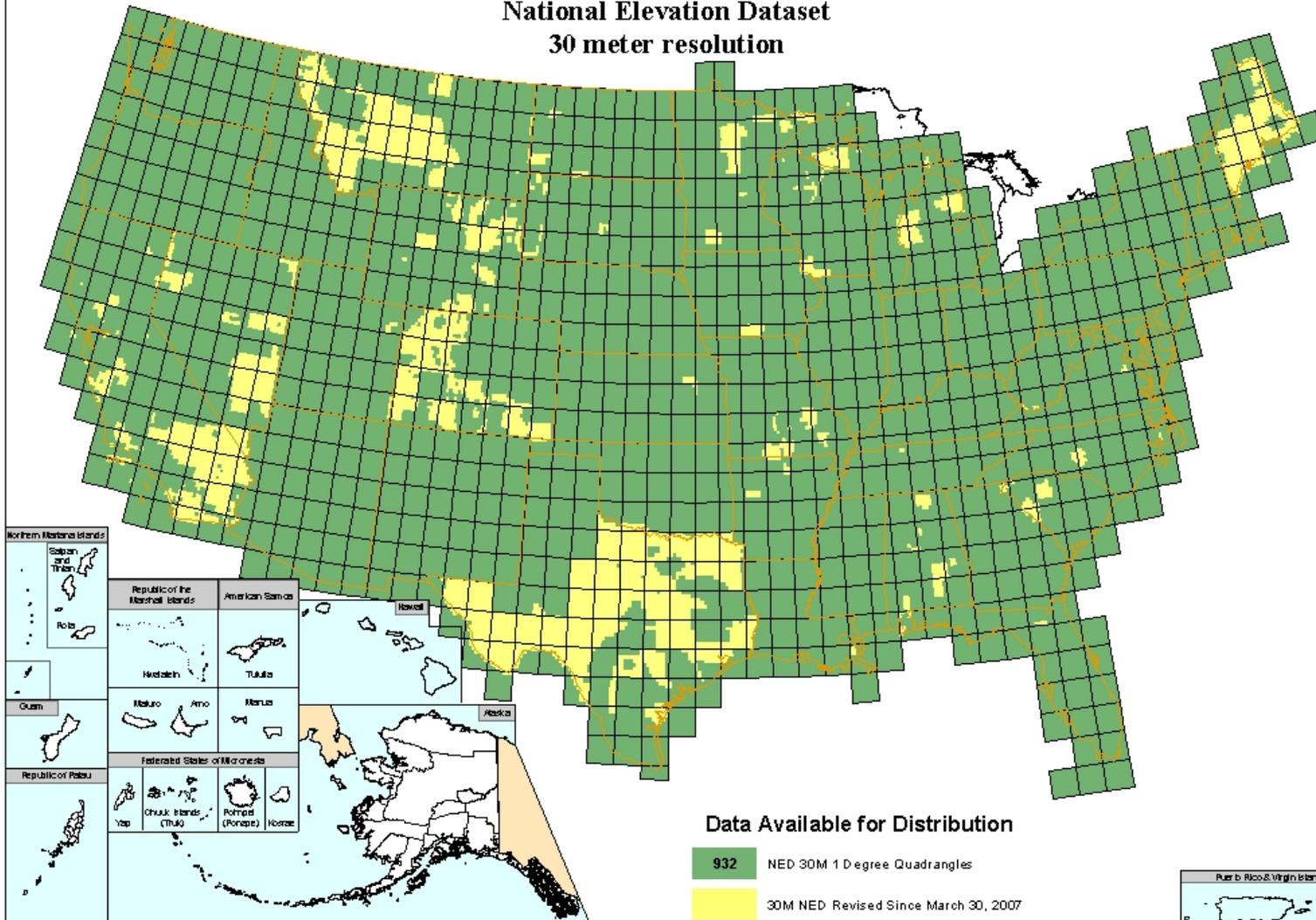


<http://datagateway.nrcs.usda.gov/Catalog/GatewayStatusMaps/NED30M.jpg>

US DEPARTMENT OF AGRICULTURE

NATURAL RESOURCES CONSERVATION SERVICE

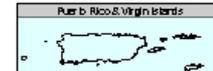
National Elevation Dataset 30 meter resolution



Data Available for Distribution

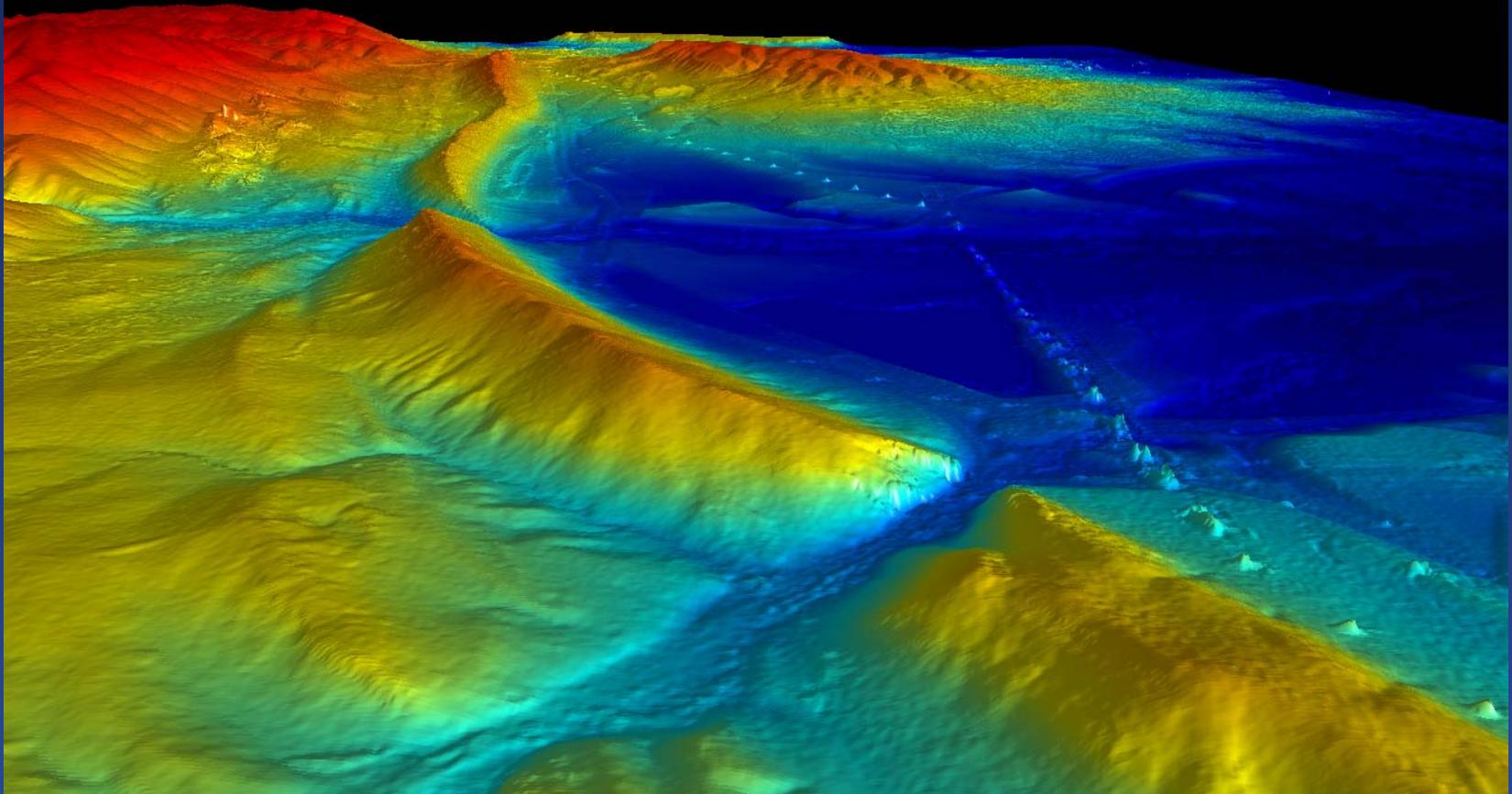
- 932 NED 30M 1 Degree Quadrangles
- 30M NED Revised Since March 30, 2007

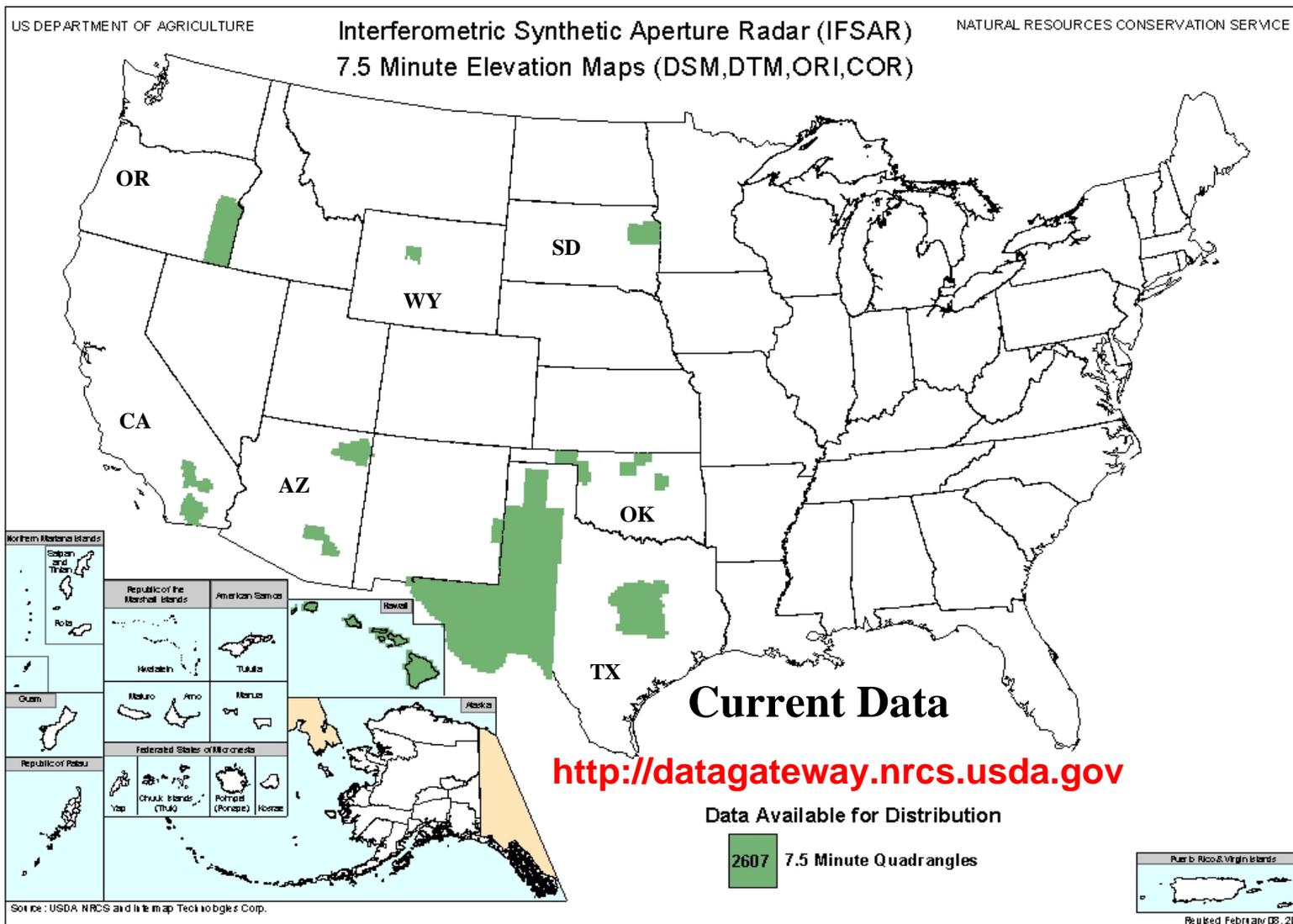
Source: USDA, NRCS & USGS.



Revised August 3, 2007

NRCS IFSAR & LIDAR Projects Status

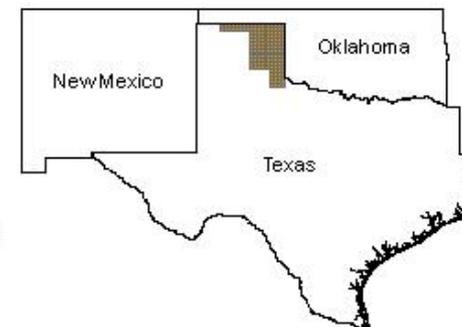
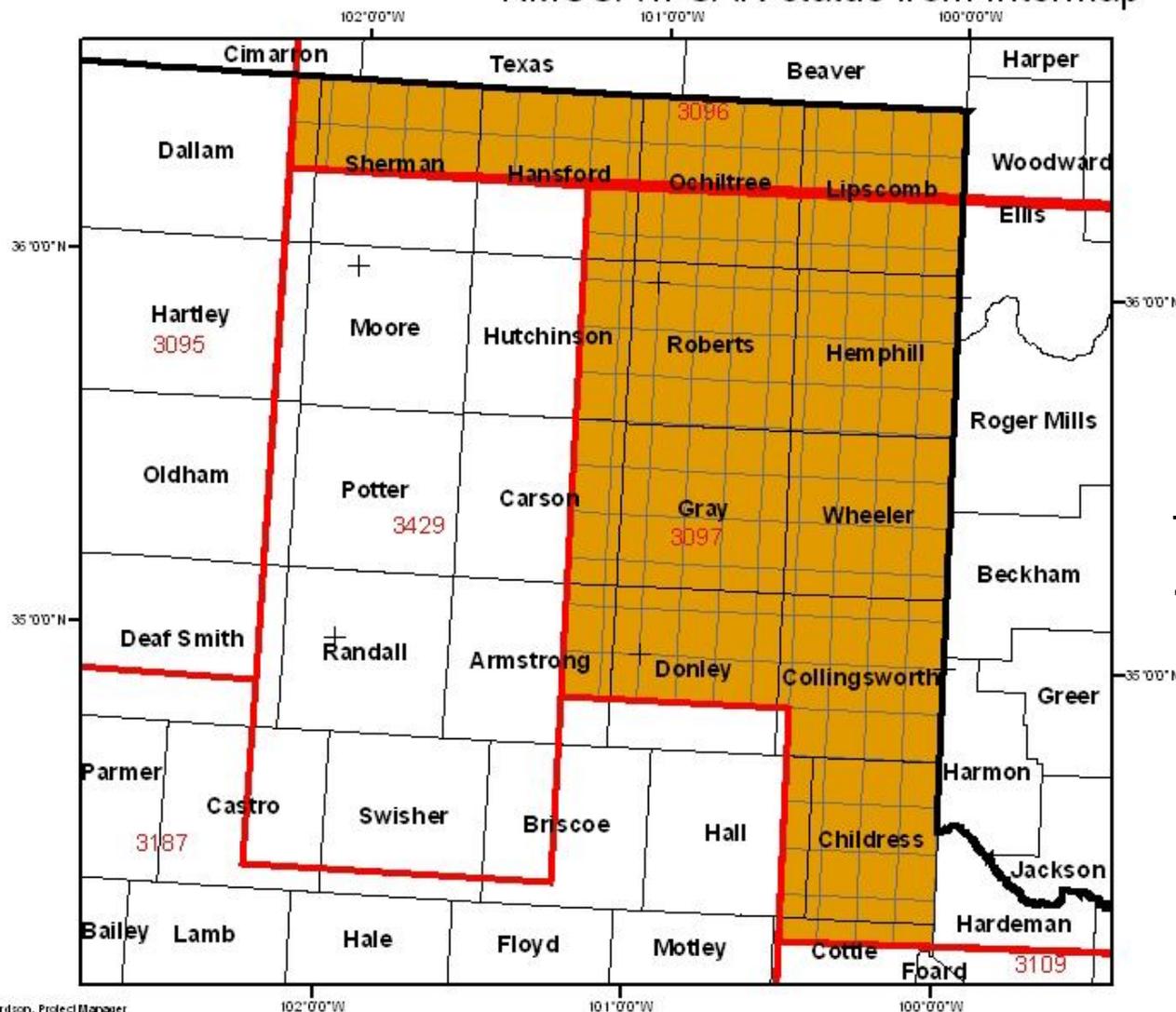




U.S. Department of Agriculture

Natural Resources Conservation Service

NMUSA IFSAR status from Intermap



Texas (166 tiles):
- Currently under review at NCGC

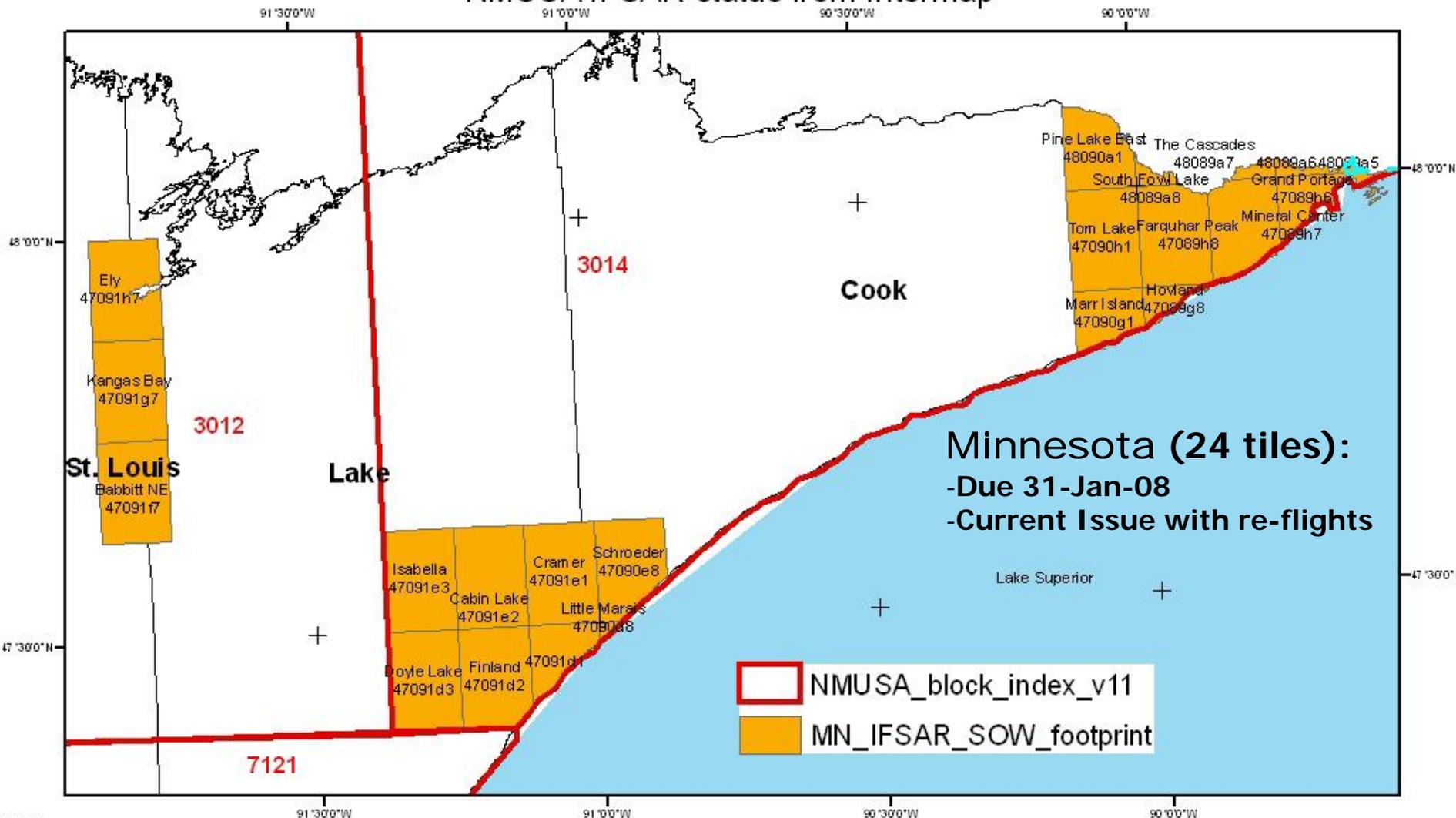
-  IPS_v11
-  IFSAR_TX_quads_FY2007 (166 tiles)

Source:
Bob Richardson, Project Manager
Intermap Technologies, Corp.
USDA NRCS IFSAR Program Progress Report

U.S. Department of Agriculture

Natural Resources Conservation Service

NMUSA IFSAR status from Intermap

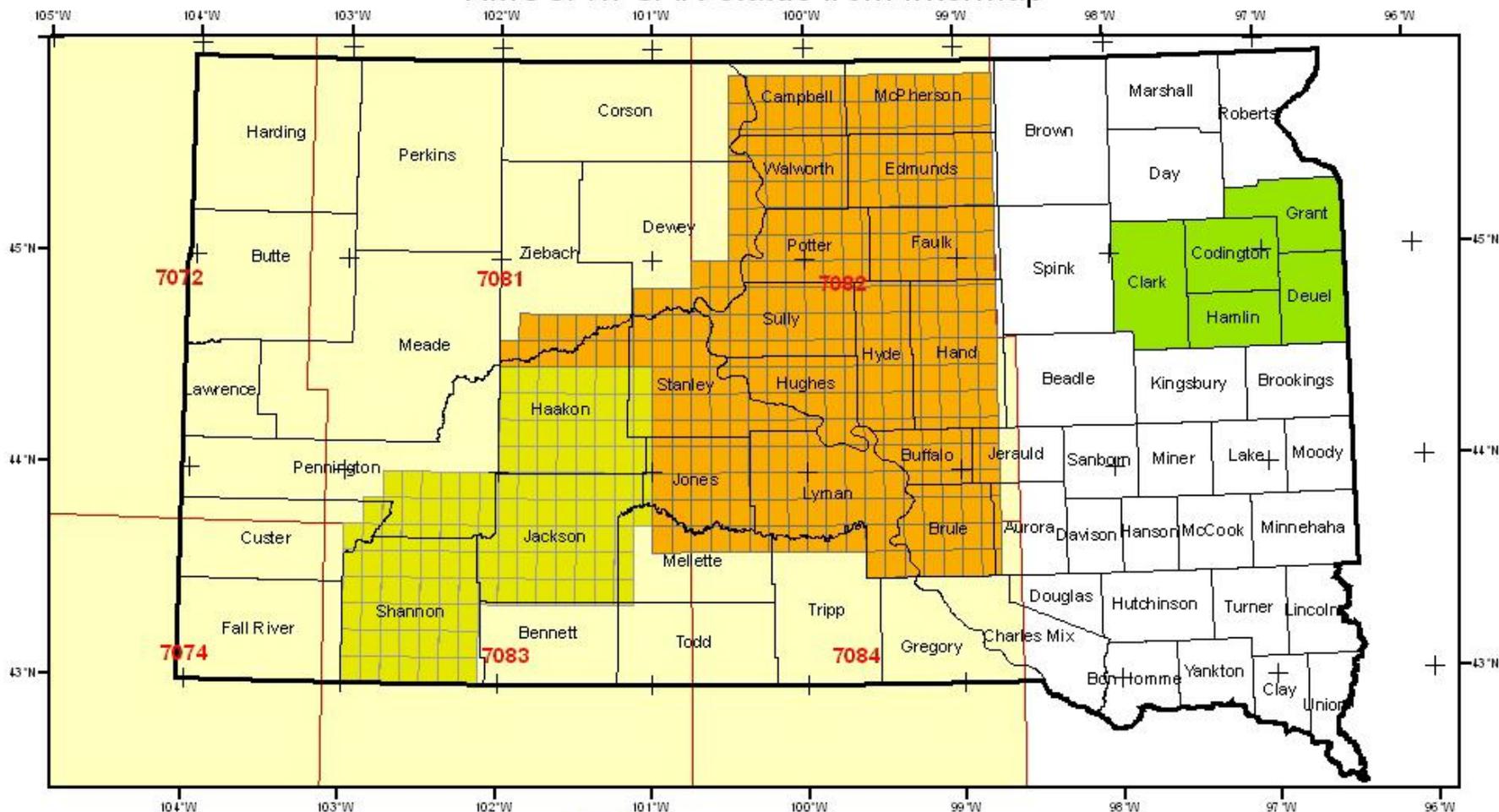


Source:
Bob Richardson, Project Manager
Intermap Technologies, Corp.
USDA NRCS IFSAR Program Progress Report

U.S. Department of Agriculture

Natural Resources Conservation Service

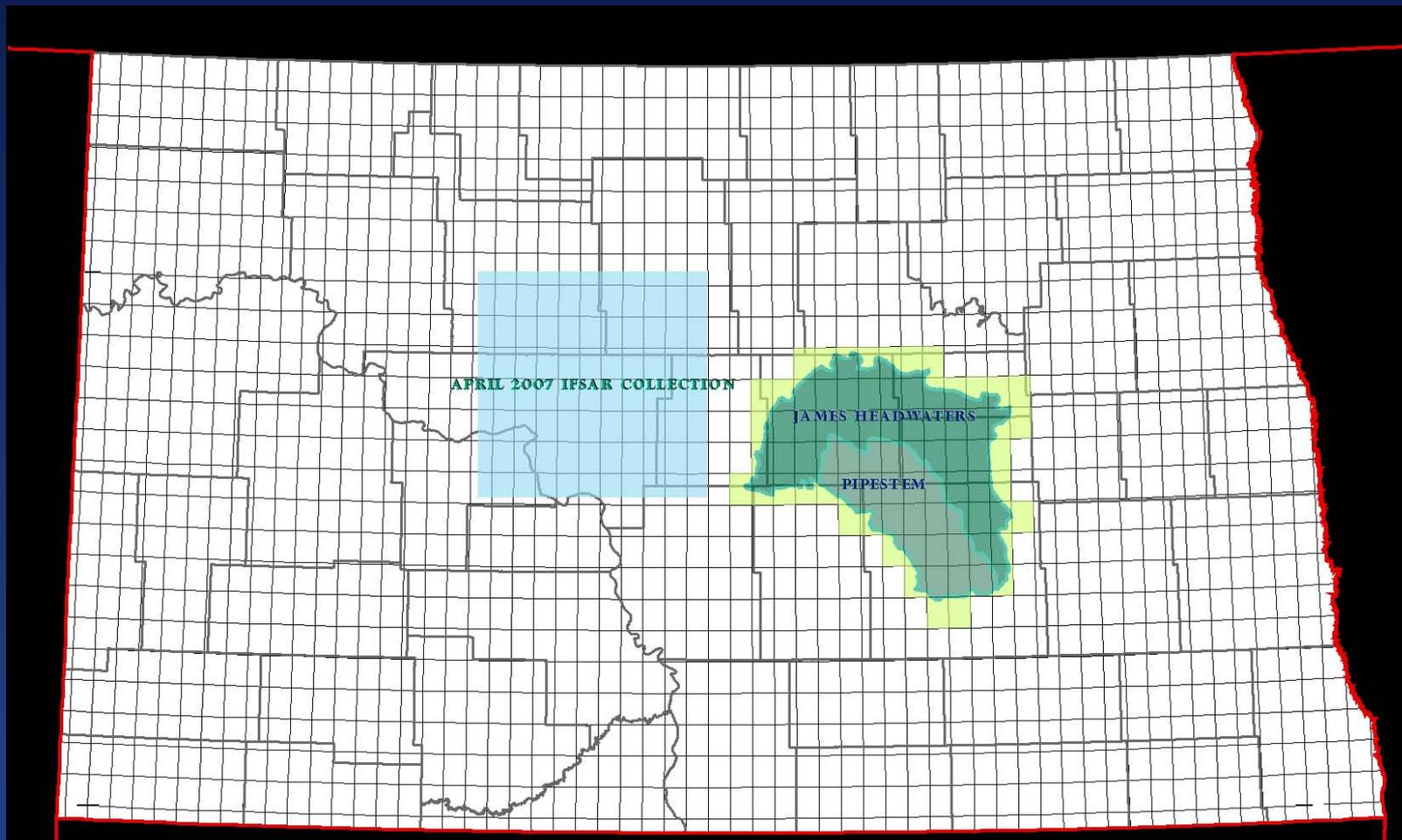
NMUSA IFSAR status from Intermap



South Dakota

- IFSAR_Order_FY 2008 (317 tiles) 219,802.24
- IFSAR_Order_FY 2007 (127 tiles) 89,412.62
- IFSAR_Order_FY 2006
- IFSAR_acquisition_in_progress

Due 15-Mar-08
-No current Issues



Potential IFSAR-NEXTMAP Acquisition

James River Headwaters and Pipestem River Watersheds, North Dakota

FY07 Potential Task Order Amendment FY06 Task Order

Eight Digit Hydrologic Units

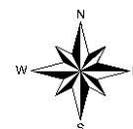
- Pipestem River Watershed
- James River Headwaters Watershed
- Outside AOI (USGS Quad Boundary)

USDA III

- April 2007 Collection

USGS Quad Boundaries

North Dakota

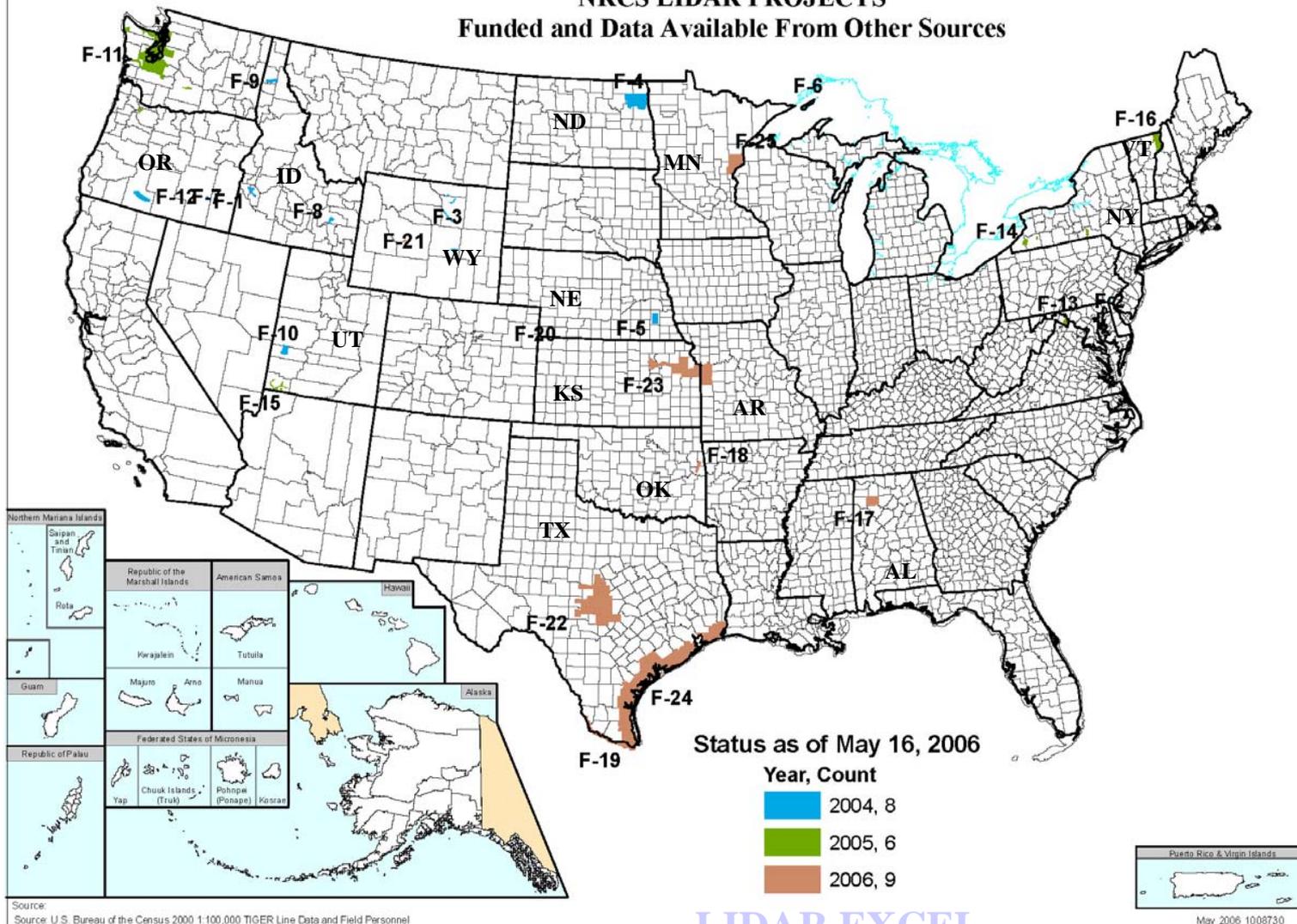


1 inch equals 35 miles

US DEPARTMENT OF AGRICULTURE

NATURAL RESOURCES CONSERVATION SERVICE

NRCS LIDAR PROJECTS Funded and Data Available From Other Sources

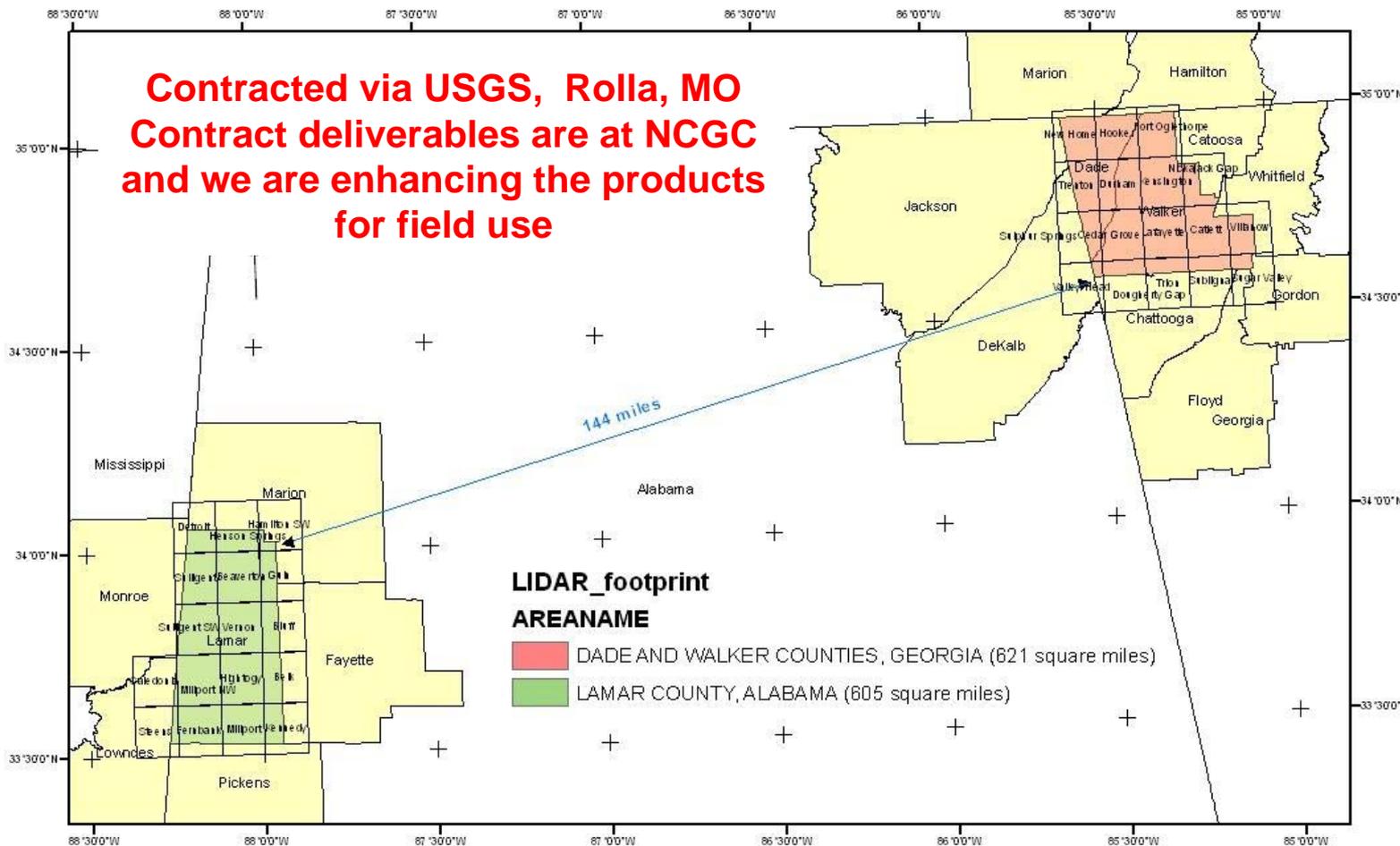


U.S. Department of Agriculture

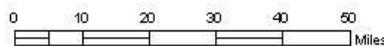
Lamar County, Alabama Dade and Walker Counties, Georgia

Natural Resources Conservation Service

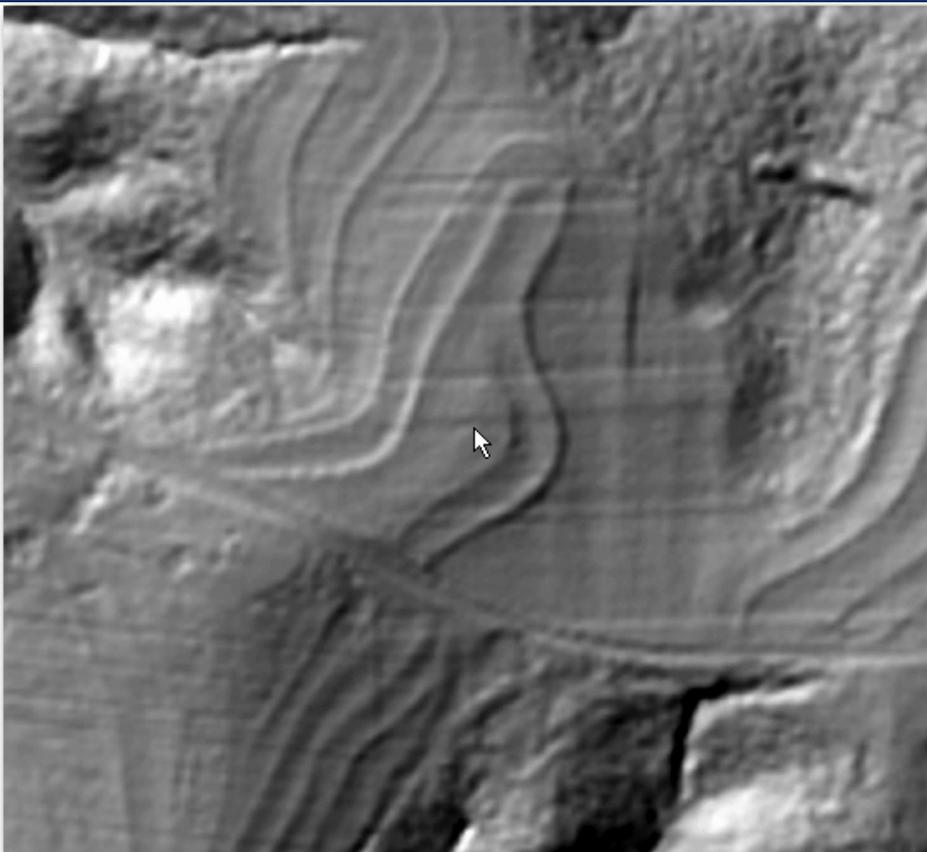
**Contracted via USGS, Rolla, MO
Contract deliverables are at NCGC
and we are enhancing the products
for field use**



Source:
Geospatial Data Warehouse layers
National Cartography & Geospatial Center, Fort Worth, Texas



August 28, 2006



Internet Explorer users must check java options and use JRE 1.5 (or higher) before proceeding. (see FAQ item 2)



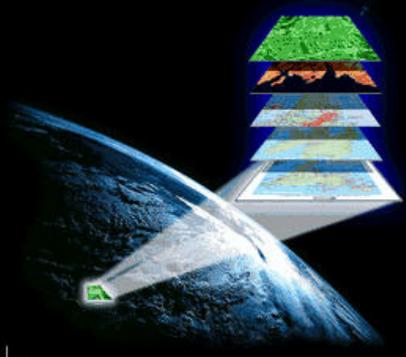
+ United States Department of Agriculture + Service Center Initiative +

Get Data Login Check Order Status Maps News FAQ About Contact Administration

+ Natural Resources Conservation Service +
+ Farm Service Agency +
+ Rural Development +

the one stop source of
natural resources data

The Geospatial Data Gateway provides One Stop Shopping for natural resources or environmental data at anytime, from anywhere, to anyone. **The Gateway** allows you to choose your area of interest, browse and select data from our catalog, customize the format, and have it downloaded or shipped on CD or DVD.



SYSTEM STATUS

October 9, 2007 3:00PM MST
SOIL orders are now being processed. It could take up to 3 days to get through all orders that were queued up.

NAIP 2003, 2004 and 2005 products are available but due to hardware limitations at the data service site these products will process very slowly. Please do not order these products unless you really need them. If you wish to order quantities of these products, please go [here](#).

Effective 13-DEC-06, JRE 1.5 (or higher) is **REQUIRED** for Step 1 and 2. The JRE can be downloaded and installed [here](#). In addition, see [FAQ #2](#) on how to configure your browser.

Geospatial

Data Gateway

Minimum Requirements: Microsoft Internet Explorer 5.5 or Netscape Communicator 4.76 with Java enabled.

WARNING: This is a United States Department of Agriculture computer system, which may be accessed and used only for official Government business (or as otherwise permitted by regulation) by authorized personnel. Unauthorized access or use of this computer system may subject violators to criminal, civil, and/or administrative action. All information on this computer system may be intercepted, recorded, read, copied, and disclosed by and to authorized personnel for official purposes, including criminal investigations. Access or use of this computer system by any person, whether authorized or unauthorized, constitutes consent to these terms.

NED 30m and 10m data available on the Gateway

IFSAR data (DTM & DSM) available to NRCS & FSA in geotiff format on the Gateway

LIDAR data is not available on the Gateway

Potential Gateway LIDAR projects are Sallisaw, OK & Essex, VT for inclusion into NED

Process Model developed by Dwain Daniels, SS uses ArcGIS server & NED 30 and 10 meter data.

Derivatives include:

Aspect

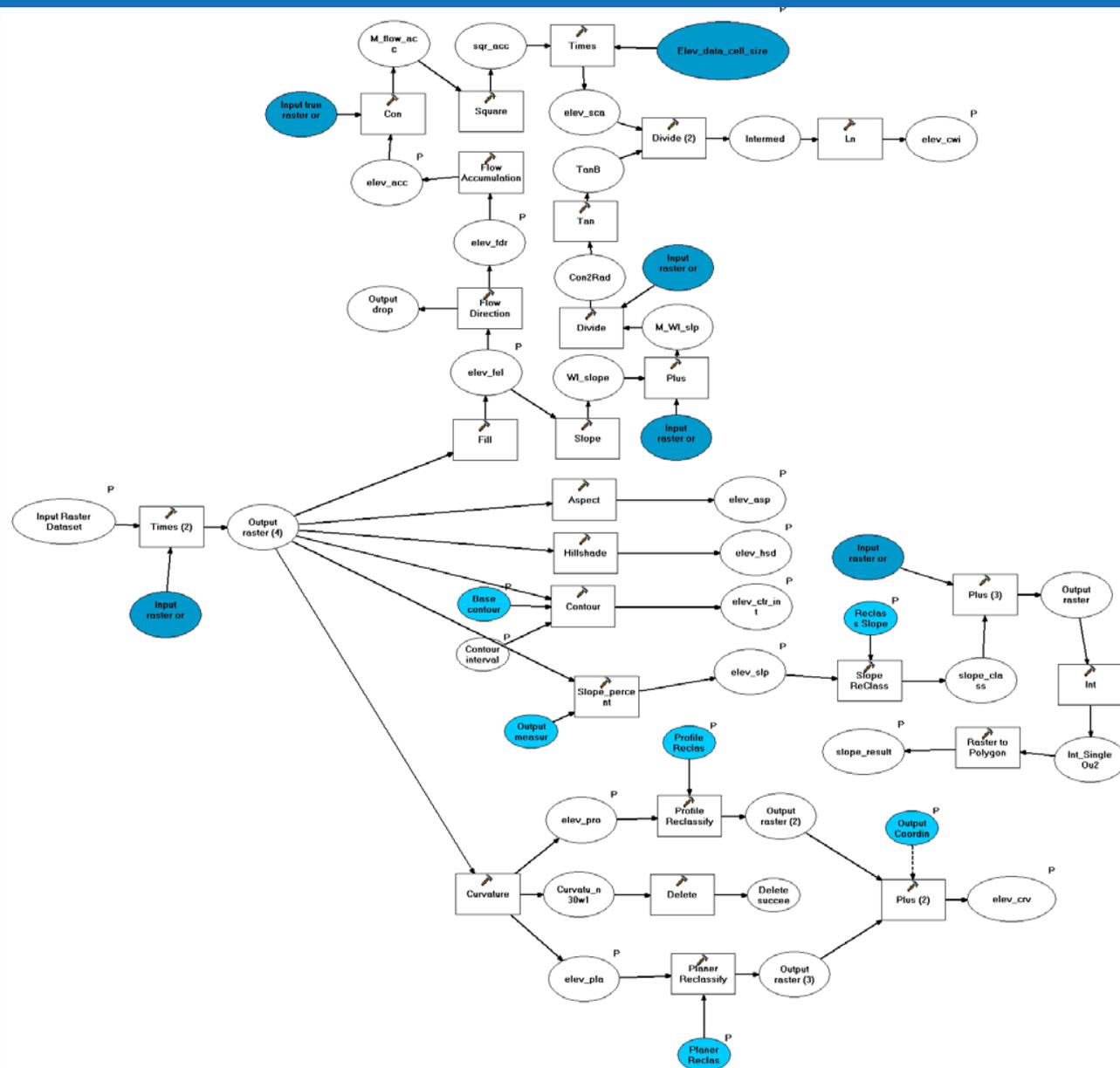
Contour lines

Curvature slope classes

Hillshade

Slope gradient

Wetness Index



Input Raster Dataset

Elev_data_cell_size

Base contour (optional)

Contour interval

elev_fel

elev_fdr

elev_acc

elev_ctr_int

elev_hsd

elev_asp

elev_slp



elev_cwi

Help

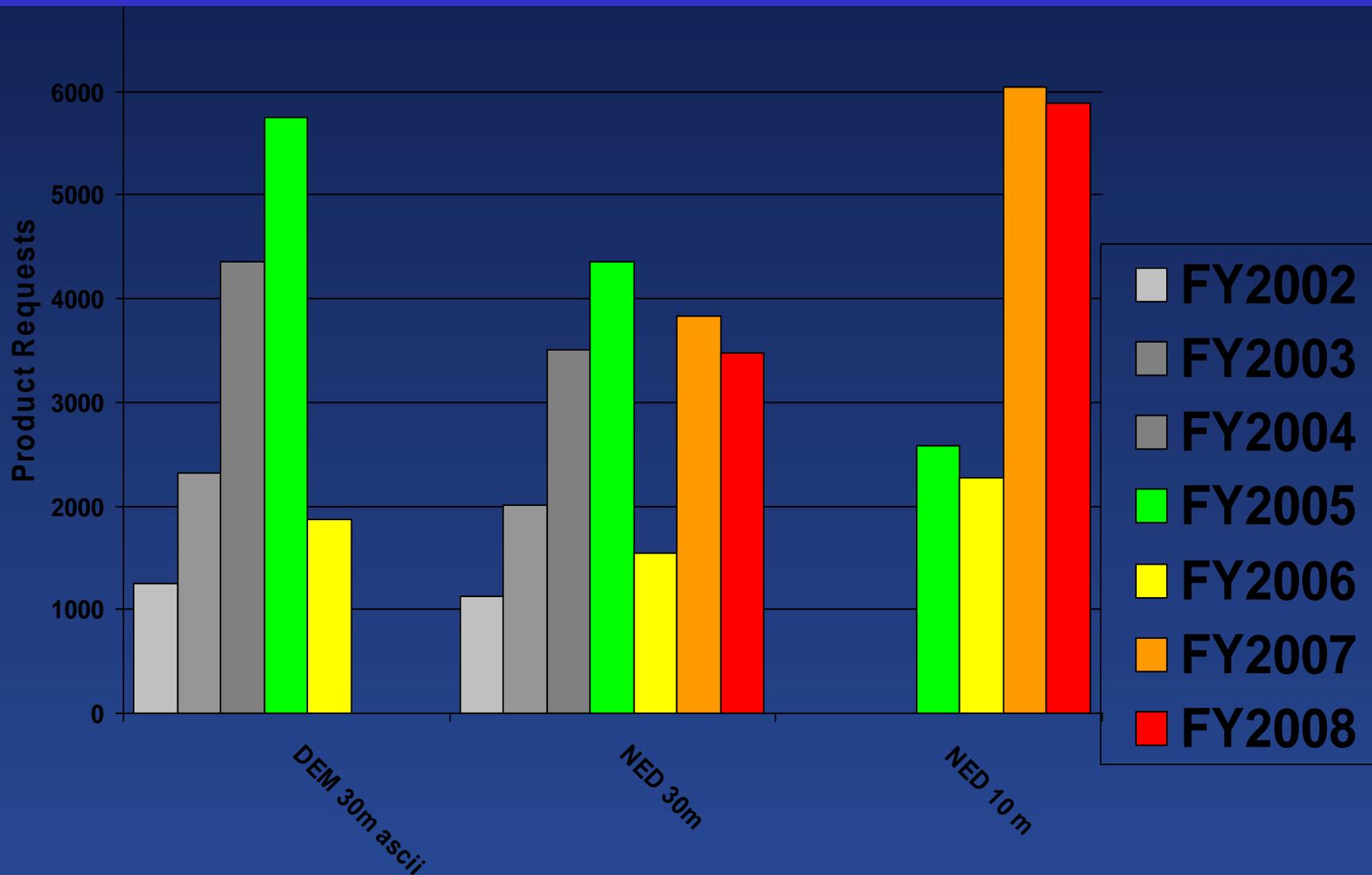
SRITB_elev_model_slope_shape_and_grad_reclass__Template

Developed for the Soil Resource Inventory Toolbox effort to process Elevation Data in order to create the profile and planer curve grids reclassified into 9 slope shapes, generate a slope gradient raster and reclassified slope gradient polygon feature class, hillshade, aspect, contour lines, and the wetness index elevation derivatives. Can be used with elevation data primarily intended for 30m or 10m datasets derived from the National Elevation Dataset (NEDS). Prior to starting the process, Set the General Environment settings for Current and Scratch Workspace. The size of the area attempted may be limited to various sizes dependant upon the resolution of the dataset used and the processing capability of the computer. **** The user needs to be aware that this model assumes the elevation units and the x,y coordinate units are in METERS. ****

ArcGIS Server Implementation for creating derivatives from **NED 30 and 10 meter data.**

NRCS plans to incorporate higher resolution grid data from **IFSAR (5 meter) and LIDAR (<5 meter)**

USGS Elevation data served via Gateway



Issues

- It is important for NRCS to have **true business requirements** before buying elevation data.
- We **need case studies from all business areas** to show how elevation can make business operations more efficient and effective.
- Elevation data is **not plug and play**. Processing, Procedures, Models, Derivatives, Analysis and Interpretation is needed. It is not an exact science. **Lots of R&D, trial & error.**

Elevation Future Directions

- Need to **identify the agency business requirements** for elevation for program areas as part of the NRCS GIS Strategy
- Complete the evaluation of IFSAR data and provide **guidance on how and where to purchase additional radar data**
- Create **lessons learned and efficiencies** from existing LIDAR projects on how and where to purchase additional LIDAR data
- Explore the USGS EROS **NED partnership** to enhance the acquisition, integration and delivery of elevation data for agency business applications.

Explore **elevation partnerships** with state and USDA

USGS LiDAR Conference Reston, VA

- Center for LiDAR Information Coordination and Knowledge (CLICK)
- USGS LiDAR Conference, May 21-22nd 2008 at the USGS Headquarters in Reston, VA
- Potential dataset at state, federal, commercial and local agencies
- Partnership strategies
- Web page: <http://lidar.cr.usgs.gov>

For More Information Contact

Steve Nechero at 817-509-3366

Email: Steven.Nechero@ftw.usda.gov

National Cartography & Geospatial Center

NCGC Home Page - <http://www.ncgc.nrcs.usda.gov>

NRCS Remote Sensing

Obtaining Satellite Imagery



Satellite Imagery

- Sources of **no cost satellite imagery** and where to order.
- Sources of **satellite imagery for purchase** and how to order.
- Imagery **license restrictions**.

USDA Satellite Imagery Archive

- The Foreign Agriculture Service (**FAS**)
 - **Repository and manager** of the USDA Satellite Imagery Archive
 - A **cost-sharing agreement** among the various subscribers including NRCS
 - **Imagery is for USDA use only**
 - **Partners can use imagery** if a cooperative agreement with NRCS is in place.
- The Archive contains **Limited SPOT**
- National georectified **Landsat, AWiFS, and AVHRR** (USGS)

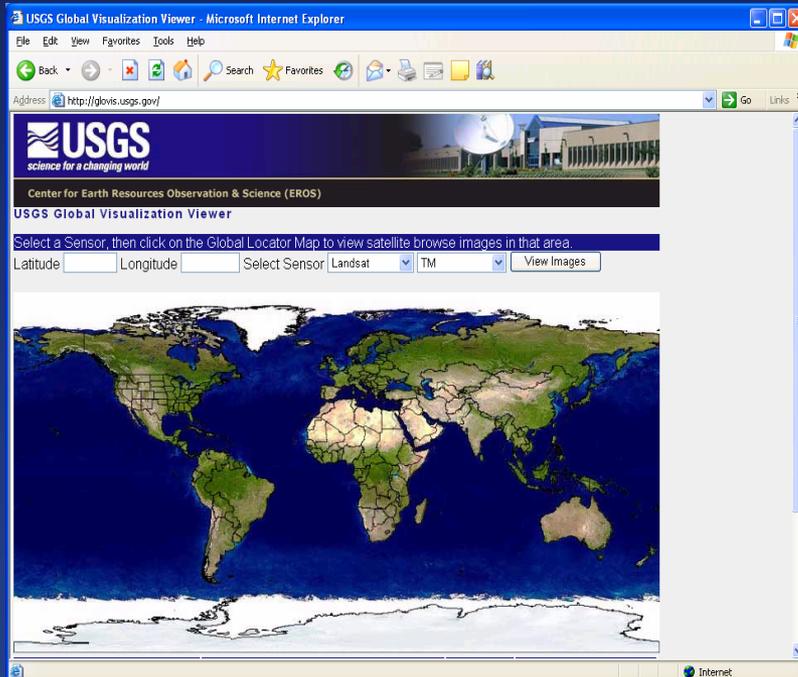


USGS-EROS Data Center (EDC) Best of the US

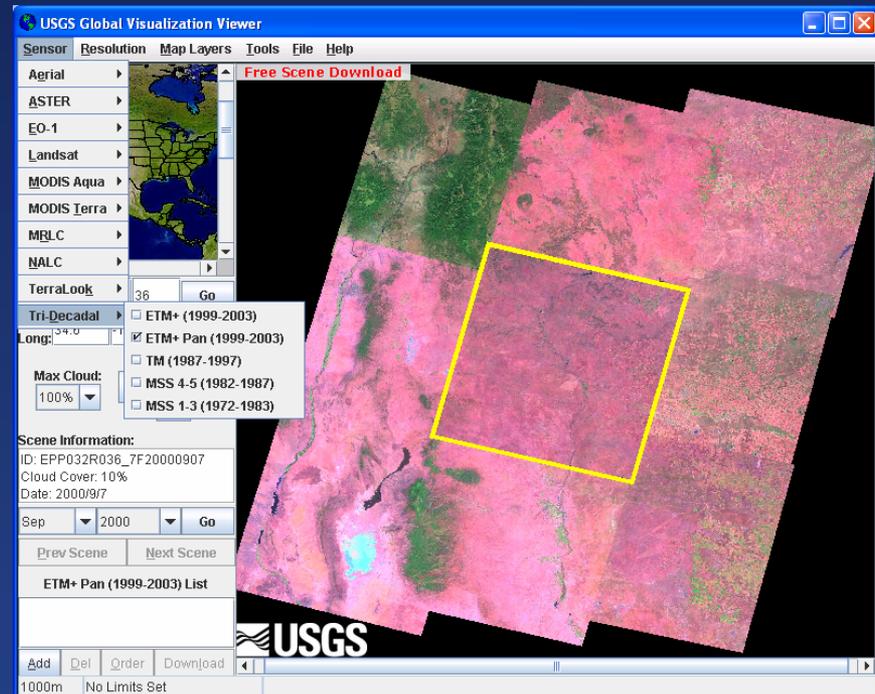
- National, cloud-free, **orthorectified**,
Landsat 7 imagery.
- Available for ftp download



USGS Global Visualization Viewer (GLOVIS) No Cost Data



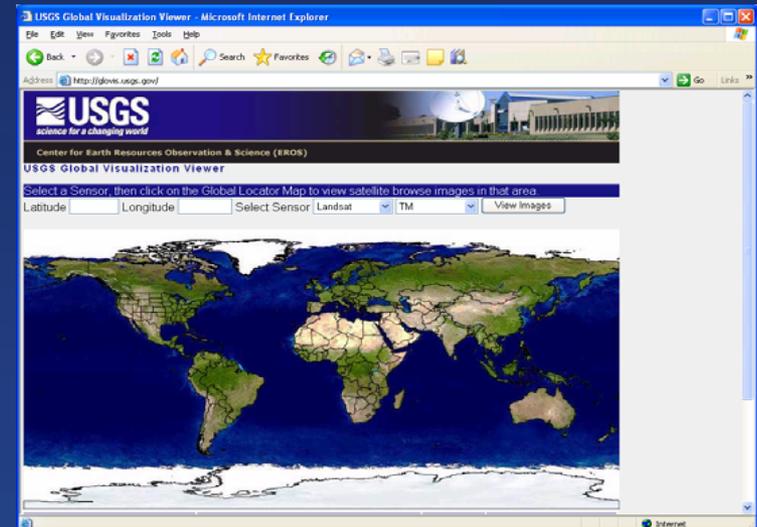
<http://glovis.usgs.gov/>



Tri-Decadal MSS and Landsat
Free Downloads

USGS Global Visualization Viewer (GLOVIS)

- Search and order tool for satellite data including
 - **ASTER**
 - **EO-1**
 - **Landsat**
 - **MODIS**



<http://glovis.usgs.gov/>

Commercial Satellite Imagery Library (CSIL)

- **Licensed Data shared** between Federal agencies.
- Shapefiles contain metadata for holdings of **IKONOS, OrbView and QuickBird**.
- Shapefiles are updated on a periodic basis.
- Data requests
 - Some ftp
 - Remainder via request to holding agency



CSIL US Coverage August 2006

http://edcftp.cr.usgs.gov/pub/metadata/satellite/ucdp/CSIL_Shapefiles



Satellite Vendors Under Contract with USDA Archive Imagery

- **Radarsat** • 2.8 – 60 m multispectral
- **Earthsat** • 0.6 – 10 m pan
- **Eurimage** • Costs below vendor catalog price
- **Geoeye**
- **Digital Globe** • **USDA-wide license**
- **SPOT**



Licensing Restrictions

- Almost all medium and high resolution satellite **imagery is copyrighted.**
- **Check the license agreement** before copying imagery or posting it on the web.
- There are **civil or criminal penalties** for violating copyright agreements.

Source	Primary Image Type	Cost	URL
Geospatial Data Gateway	NDOP, NAIP	None	http://datagateway.nrcs.usda.gov/
APFO	Aerial Photo	\$	http://fsa.usda.gov
NARA	Aerial Photo	\$	http://www.archives.gov
USDA Imagery Archive	Landsat, AWiFS, AVHRR	None	http://www.pecad.fas.usda.gov/remote.cfm
CSIL	Ikonos, QuickBird, Orbview	None None	http://edcftp.cr.usgs.gov/pub/metadata/satellite/ucdp/CSIL_Shapefiles
EROS Best of the US	Landsat	None	See Excel spreadsheet
GLOVIS	Tri-Decadal MSS and Landsat	None	http://glovis.usgs.gov/
USGS Seamless	NDOP, NED	None	http://seamless.usgs.gov/
EarthExplorer	Landsat, AVHRR	\$\$	http://edcsnsl7.cr.usgs.gov/EarthExplorer

Source	Primary Image Type	Cost	URL
USDA Contract	Landsat Radar, Ikonos, QB, OV, SPOT	\$\$ \$\$\$ \$\$\$	robert.tetrault@usda.gov
NASA JPL	New ASTER	\$	http://asterweb.jpl.nasa.gov/NewReq.asp
NASA JPL	ASTER Homepage		http://asterweb.jpl.nasa.gov
Global Land Cover Facility	Landsat, MODIS, ASTER	None	http://glcf.umiacs.umd.edu/index.shtml
AmericaView	Landsat, MODIS, ASTER	None	http://www.americaview.org/
Intermountain Region Digital Image Archive Ctr.	Landsat, ASTER	None	http://earth.gis.usu.edu
Land Processed Distributed Active Archive Center (LPDAAC)	MODIS, ASTER	None Or \$	http://lpdaac.usgs.gov/datapool/datapool.asp

For Additional Information Contact

Dorsey Plunk, at 817-509-3348

Email: dorsey.plunk@ftw.usda.gov

National Cartography & Geospatial Center

NCGC Home Page - <http://www.ncgc.nrcs.usda.gov>

NAIP 2008 Overview

Partnership Opportunities for USDA-NRCS

NAIP 2008 Program Enhancements

The **NAIP Orthoimagery program** added two options depending on available funding from Federal and State Partnerships for FY2008.

1) **Four Band Orthoimagery Acquisition**

-allows end users to view NAIP Orthoimagery in Natural Color or Color Infrared (CIR)

2) **State Provided Ground Control Points**

-State provided ground control points will increase accuracy of NAIP Orthoimagery

USDA-NRCS Partnership

- Starting with NAIP 2008, FSA will acquire **one meter Orthoimagery** only
- The **two meter NAIP** compliance product is discontinued
- NRCS contribution of **\$500,000** to NAIP 2008 will leverage a **\$16,700,000** Orthoimagery Base for NRCS

NAIP 2008 Specifications

- **DOQQ Spatial Resolution** **1 Meter**
- **DOQQ Spectral Bands** **4 Band/CIR**
- **DOQQ Horizontal Accuracy** **Absolute, 6M**
- **Flying Season** **Early Leaf Emergence**
- **Coverage** **Full State**
- **Refresh Cycle** **3 to 5 Years**

Arizona NAIP 2007 Four Band Test Pilot

NAIP 2008 will include complete statewide acquisitions in **Four Band** (Natural Color and Color Infrared) for the following states.

- 1) Virginia
- 2) Connecticut
- 3) Texas
- 4) Indiana
- 5) Kansas
- 6) Minnesota
- 7) Rhode Island
- 8) Tennessee
- 9) Vermont

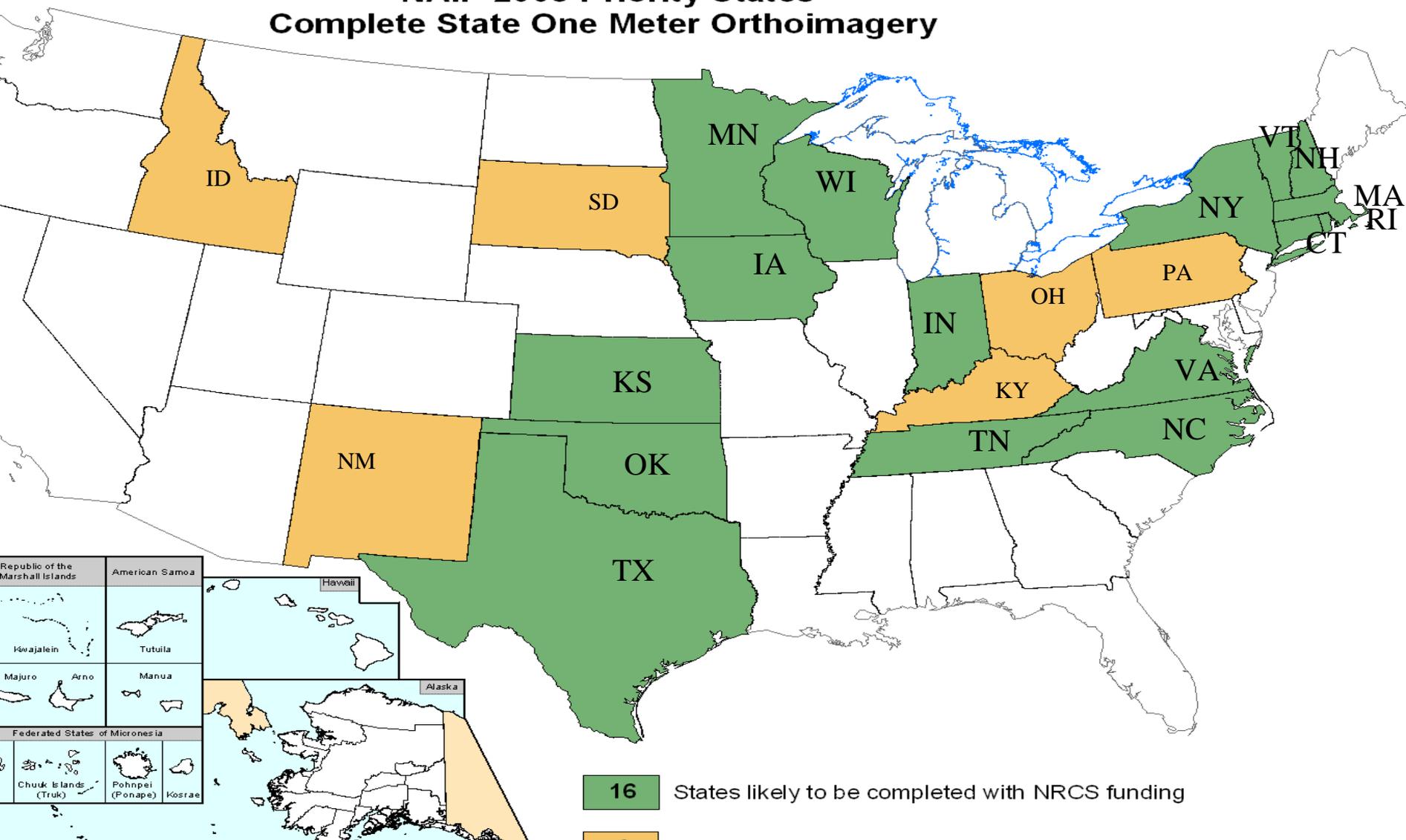


Natural Color (Bands 1,2,3)



Color Infrared (Bands 2,3,4)

NAIP 2008 Priority States Complete State One Meter Orthoimagery



NAIP 2008 Orthoimagery

<u>State</u>	<u>Bands 3 or 4</u>	<u>Accuracy Control</u>	<u>DOQQ</u>
CT	4	No	412
IN	4	Yes	2,692
ID	3	No	4,238
KS	4	No	5,902
MA	3	No	740
MN	4	Yes	6,762
NH	3	Yes	769
NY	3	No	3,879
NC	3	Yes	3,577
OK	3	No	4,815
RI	4	No	115
TN	4	No	3,001
TX	4	Yes	15,310
VT	4	Yes	813
VA	4	Yes	3,032
WI	3	No	4,503
DOQQ Total			60,560

2008 NAIP Orthoimagery Notes

ID, OH, PA, KY, SD, NM are potential NAIP 2008 States with partnership funding and acquisition costs

-States = 16 Minimum with Full Statewide Coverage

- DOQQ 4 Band = 32,955

- DOQQ 3 Band = 27,605

- Accuracy Control = 7 States

NAIP 2008 Partnership Funding

Farm Service Agency

USDA – Forest Service

USDA – Natural Resources Conservation Service

USGS

State Governments

\$ 16,700,000 Value for NAIP 2008 with NRCS Contribution

NAIP 2008 Summary

- **NRCS LEVERAGING For NAIP 2008 INVESTMENT (16 states)**
- **SIGNIFICANT RETURN ON INVESTMENT (\$16,700,000)**
- **NAIP ORTHOIMAGERY REFRESH CYCLE IS 3 YEARS (OPTIMUM) TO 5 YEARS**
- **CONSISTENT WITH SERVICE CENTER AGENCIES GIS STRATEGIC PLAN**
- **CONSISTENT WITH NRCS GEOSPATIAL STRATEGIC INVESTMENT**

NCGC Geospatial WMS Soil Survey Support

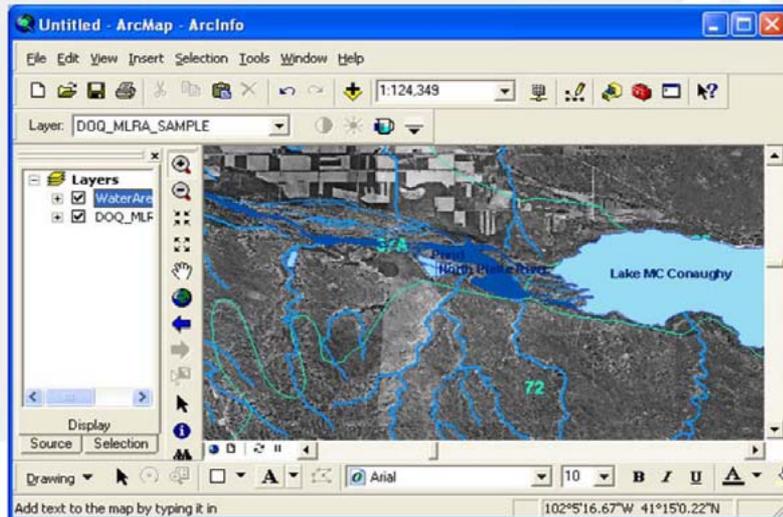
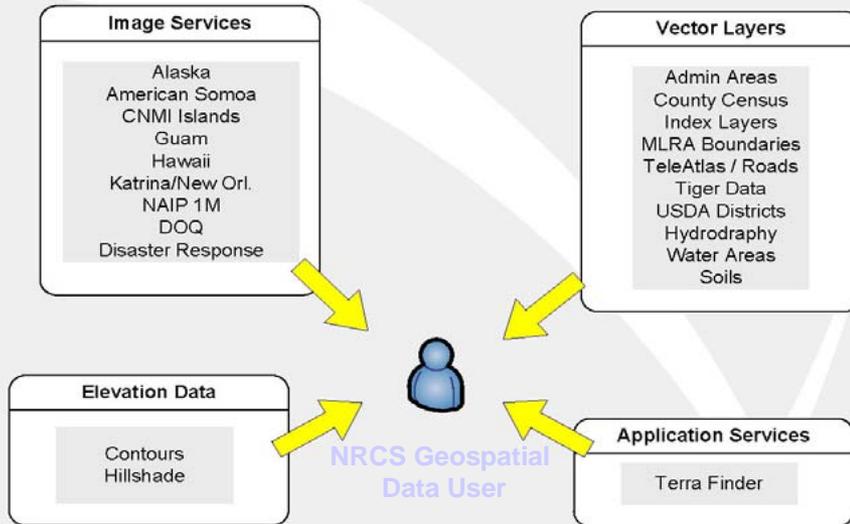
NCGC Geospatial WMS

- Visualization & thin client analysis
- Authoritative datasets
- Centralized data
- Less data management
- For all NRCS program use
- MLRA SS business & project plan development

Geospatial Data Delivery



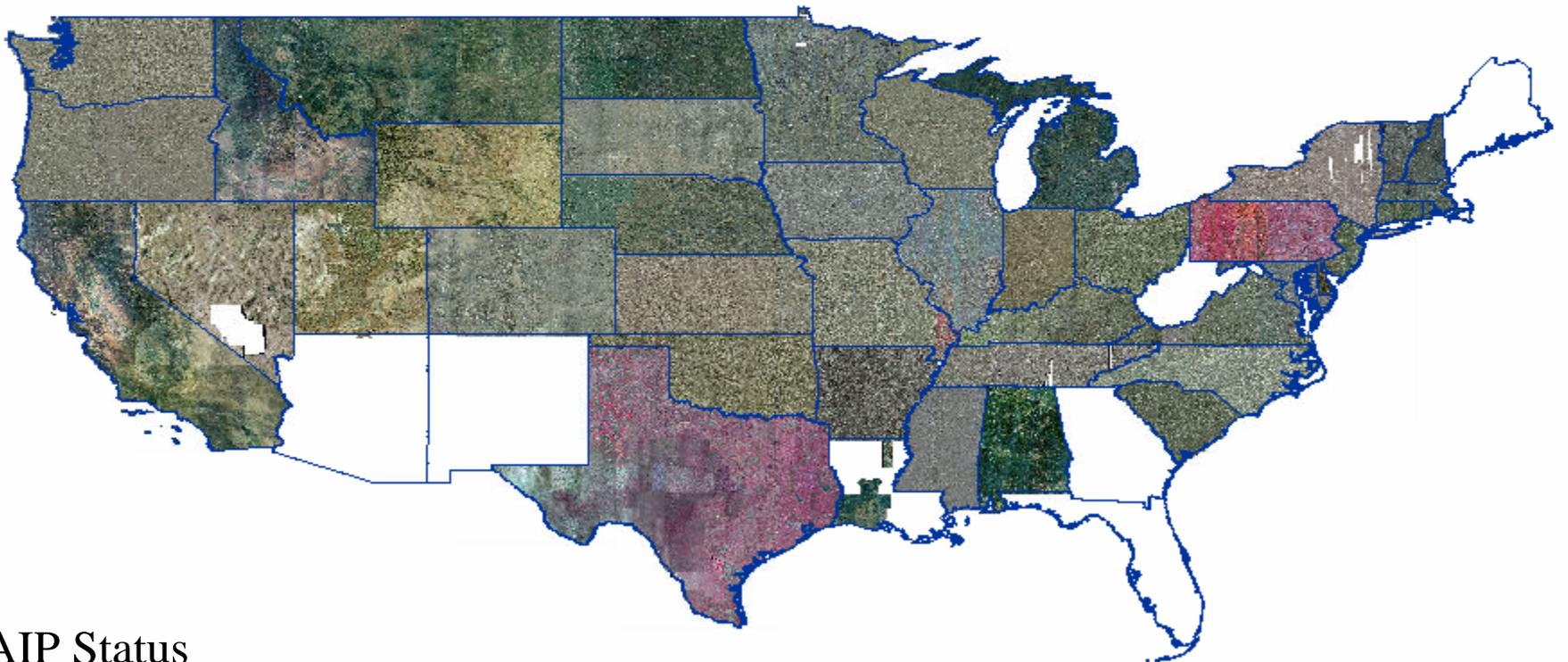
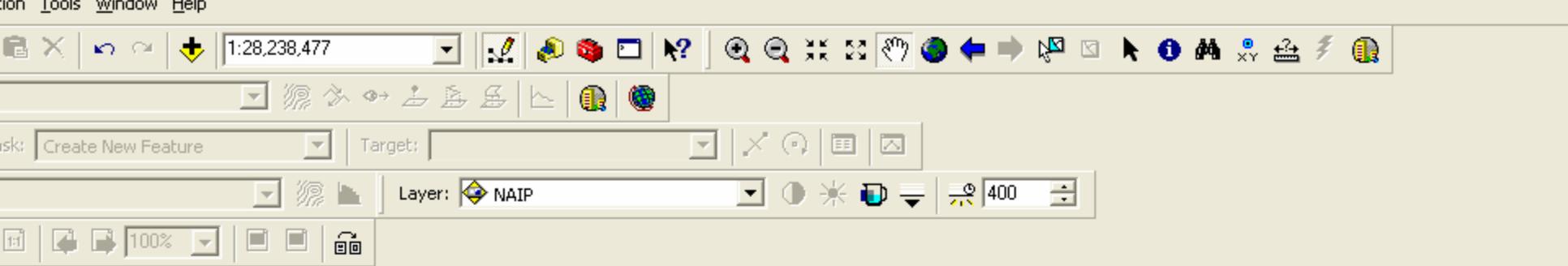
NCGC Integrated Geospatial Data and Imagery Web Services



Web Map Services (WMS) can provide many Geospatial Data Layers (Raster and Vector) to NRCS Geospatial Data users for their **Business Applications** needs.

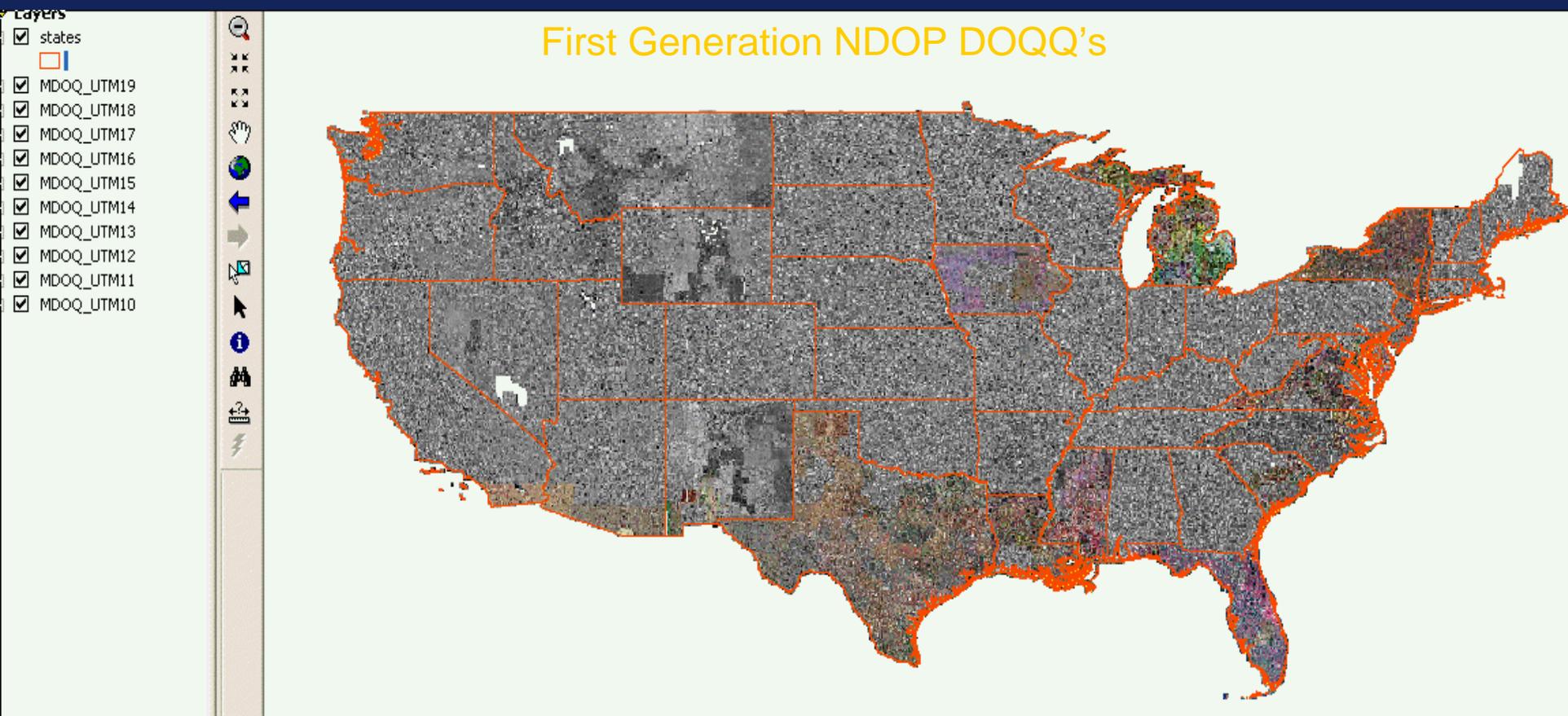
The NCGC is developing many WMS for use by NRCS Program and Scientific Functions such as...

- 1) Conservation Planning
- 2) Soil Survey
- 3) Natural Resource Inventory and Assessment
- 4) Engineering Application
- 5) Disaster Response

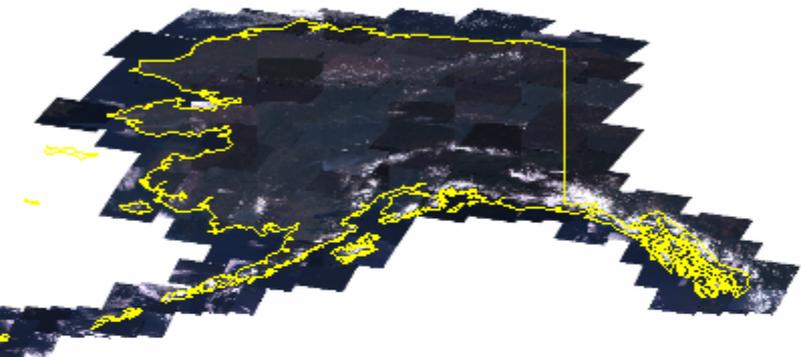


NAIP Status
March 12, 2008

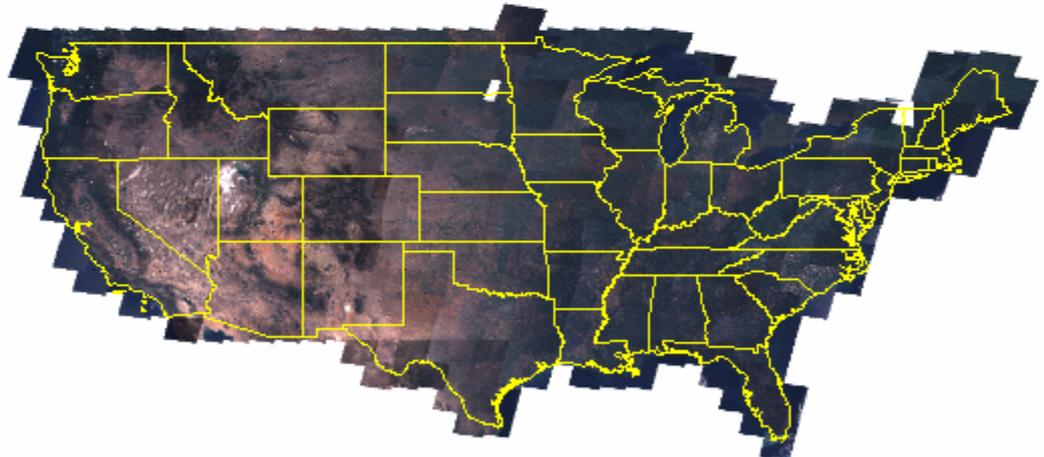
NCGC Developed Geospatial Web Map Service Examples



NCGC has created a Geospatial Web Map Service for all first generation DOQQ's

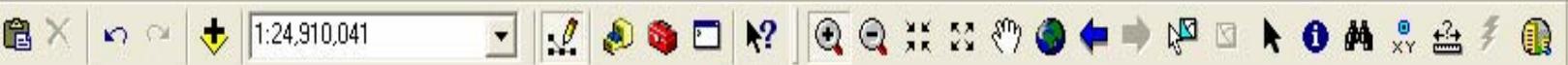


Landsat



March 12, 2008

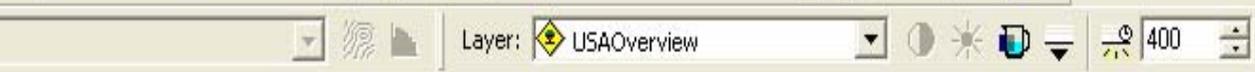
1:24,910,041



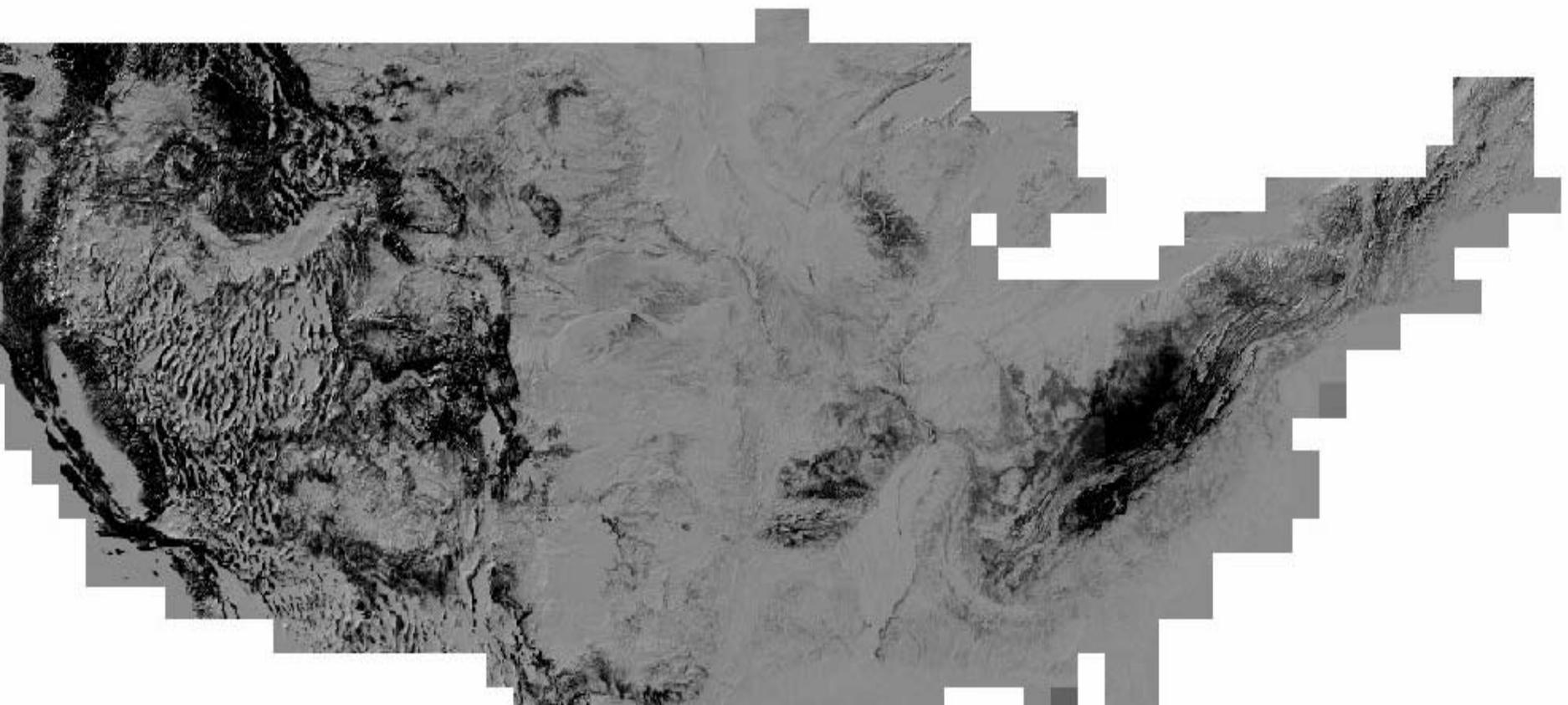
sk: Create New Feature Target:



Layer: USAOverview



100%



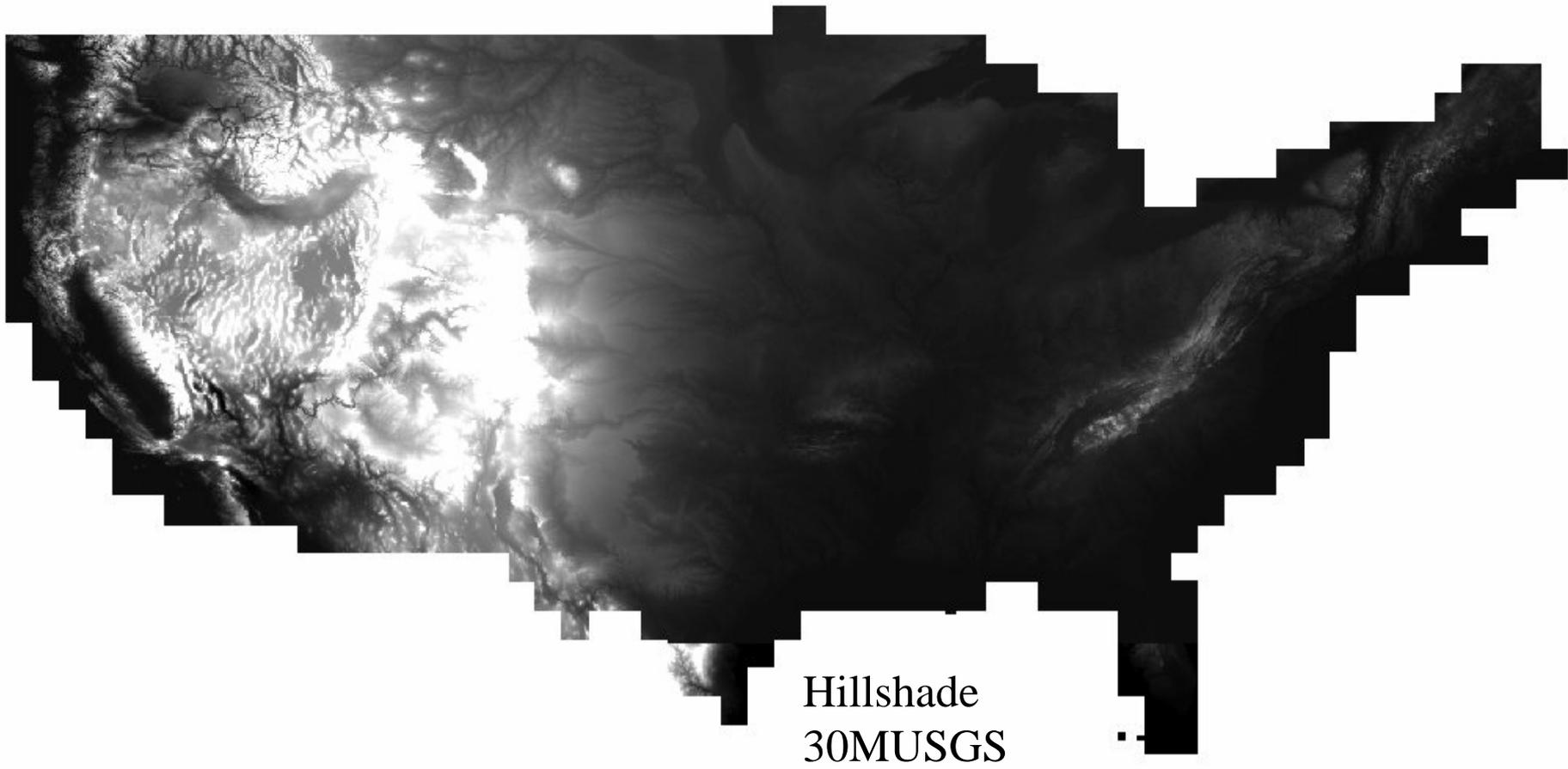
1:24,910,041

Layer: [] Show/Hide Command Line Window

Task: Create New Feature Target: []

Layer: [] Layer: USAOverview 400

100%



Accessing NCGC Geospatial Integrated Data Service Portal

Web Browser Access

Web Portal / Browser Access:
<http://wms.ftw.nrcs.usda.gov>

The screenshot shows a Microsoft Internet Explorer browser window with the following elements:

- Address Bar:** <http://wms.ftw.nrcs.usda.gov/>
- Page Header:** United States Department of Agriculture, NRCS Natural Resources Conservation Service, National Cartography and Geospatial Center.
- Navigation Menu:** NCGC Home, About Us, News, Programs, Projects, Technical Resources, Products & Services.
- Search Section:** A search box with "NCGC" selected in a dropdown menu and a "GO" button.
- Main Content Area:**
 - SCA GDW Web Map Services:** A section with a heading and a paragraph: "With ArcGIS version 9 or higher, you can connect to national ArcIMS map services for any data set in the SCA Geospatial Data Warehouse (GDW)." Below this is a heading for "NCGC GDW Web Map Services" and another paragraph: "The ArcIMS services are hosted at wms.ftw.nrcs.usda.gov. You can browse the provided interactive website of the map services."
 - Image Services:** A list of regions: American Samoa, Hawaiian Islands, GUAM, Puerto Rico, Alaska, Northern Mariana Islands, National Land Cover Dataset, and Katrina New Orleans.
 - Imagery-Derived Product:** A heading for a section that is partially cut off.
- Right-Side Panel:** A search interface with a "1" numbered step: "Type place name & press Find:" followed by a text input field and a yellow "FIND" button. Below this is the text "or draw search area" and a set of map navigation icons (pan, zoom, home, etc.). A map of the United States is shown with Alaska highlighted. A "2" numbered step: "Choose content type:" followed by a dropdown menu currently set to "Live Data and Maps".

Accessing NCGC Integrated ArcIMS Data and Web Services

Add ArcIMS Server

URL of server:

Which services do you want to connect to on this server?

All services

Just the following service(s)

- ContinentalOverview
- ContourUTMZone10
- ContourUTMZone11
- ContourUTMZone12
- ContourUTMZone13
- ContourUTMZone14

Account

Show secure services

User name:

Password:

Save Name/Password

ArcIMS Access

Add ArcIMS Server:
<http://wms.ftw.nrcs.usda.gov>

Add Data

Look in:

- DigitalRasterGraphic_O_Index
- DigitalRasterGraphic_P_Index
- DigitalRasterGraphic_R_Index
- F_Census
- F_FEMAQ3
- F_NationalHydrologicDataset24K
- F_Precipitation
- F_QuadIndex
- F_Watershed-hydrologicUnit
- FEMAFloodData
- Gazetteer
- GDW_StatePlane_Time_UTMZone
- GeographicNames
- HA_OverView
- Hilshade
- Hilshade10MUSGS
- HilshadeUSGS
- HydrologicUnitClassifications

Name:

Show of type:

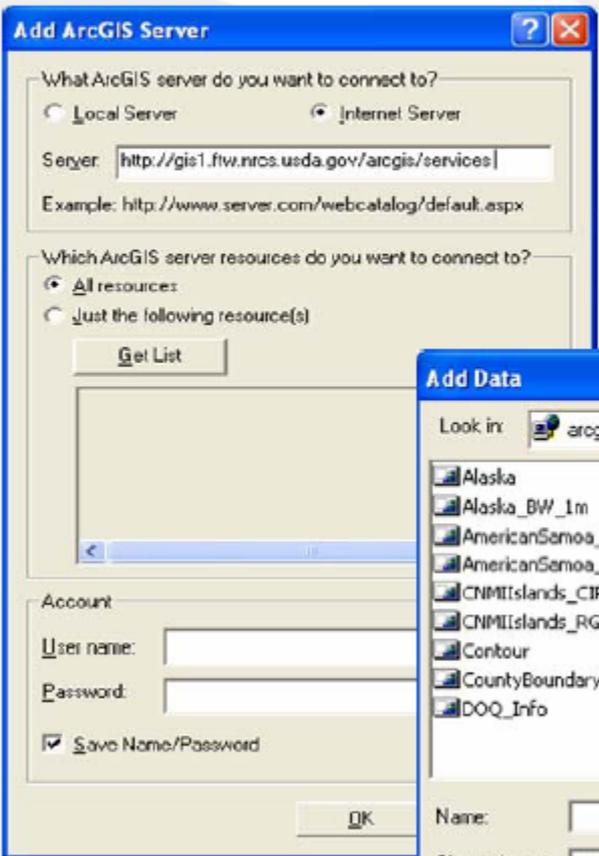
Untitled - ArcMap

File Edit View Insert

Layer:



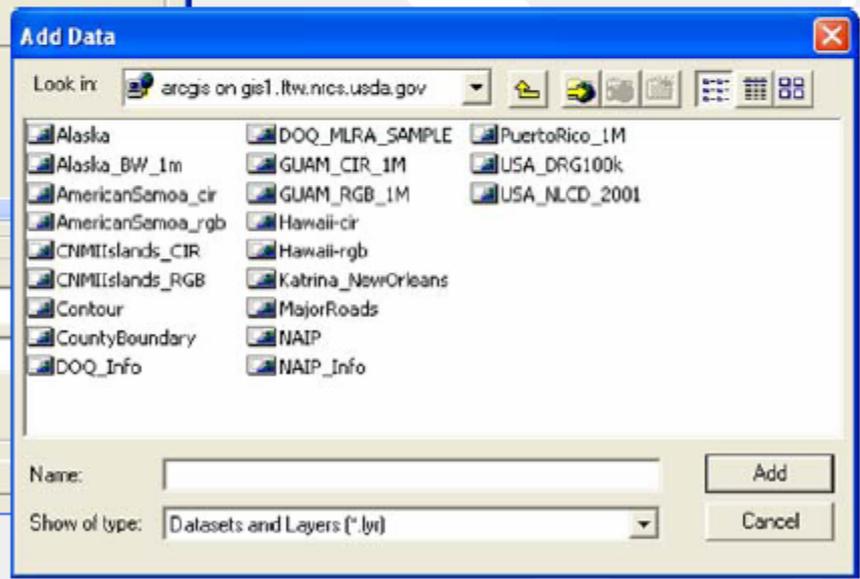
Accessing Integrated NCGC GIS Server Data and Web Services



GIS Server Addresses

Add GIS Server:

http://gis1.ftw.nrcs.usda.gov/arcgis/services
 http://gis2.ftw.nrcs.usda.gov/arcgis/services



NCGC Soil Survey Support Summary

- Geospatial Data
- Geospatial Technology
- Geospatial Services

Thank You

National Cartography & Geospatial Center



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