

**USDA Service Center Agencies  
Geospatial Data Management Team  
Data Management Plan For**

**ADS40 Hurricane Response Imagery  
7.5' Quadrangle Mosaics**

**November 2005**

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and  
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**I. Purpose and Scope (business case)**

***A. Purpose***

The general purpose of the imagery collection and processing is to provide data for federal and state agencies to visually denote and quantify damage areas from no damage areas, and to quantify the degree of damage as heavy, moderate or light.

This imagery assists NRCS employees working with the Federal Emergency Management Agency (FEMA), State and federal agencies, and local units of government in conducting post-disaster cleanup and restoration projects in Louisiana, Florida, Alabama, Mississippi, and Texas.

***B. Scope***

The scope of the dataset is the area of the United States affected by the destruction of Hurricanes Katrina and Rita that occurred in August and September of 2005. These areas include the Gulf Coast of Alabama, Florida, Louisiana, Mississippi, and Texas.

For a status map of the affected areas see: <http://nm6.ftw.nrcs.usda.gov/website/ads40>

**II. Acquisition**

***A. Data Source***

**1. Producer Information**

**a. Name**

3001, Inc. (under contract through the U.S. Army Corps of Engineers)

**b. Location of Headquarters**

3601 SW 2nd Ave., Suite Y  
Gainesville, FL. 32607

352-379-3001

- c. Internet Address

<http://www.3001data.com>

## 2. Publisher Information

- a. Name

United States Department of Agriculture-Natural Resources Conservation Service  
National Cartography and Geospatial Center

- b. Location of Headquarters

USDA-NRCS  
National Cartography and Geospatial Center  
501 W. Felix St., Bldg. 23  
Fort Worth, Texas 76115

- c. Internet Address

<http://www.ncgc.nrcs.usda.gov>

## 3. Acquisition Information

- a. Delivery Media

ADS40 mosaics are available on CDROM, DVD, DLT 320 tape, and Firewire/USB2 disk drives.

- b. Download URL

ADS40 compressed 7.5' quad mosaics can be downloaded from the Data Gateway:

[www.datagateway.nrcs.usda.gov](http://www.datagateway.nrcs.usda.gov)

- c. Projected Data Availability Schedule

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## **B. Standards Information**

### 1. Geospatial Data Standard

- a. Standard Name and Steward Information

United States Department of Agriculture (USDA) Service Center Agencies (SCA)  
Standard For Geospatial Data

- b. Standard Version

SCI Std 003-02  
October 15, 2003

- c. Standard URL

<http://www.itc.nrcs.usda.gov/scdm/docs/SPG-GeospatialDataStandard.pdf>

## 2. Metadata Standard

### a. Standard Name and Steward Information

Metadata are compliant with:  
Federal Geographic Data Committee (FGDC)  
Content Standard for Digital Geographic Metadata FGDC  
STD-001-1998 Version 2 revised June 1998

And:  
United States Department of Agriculture (USDA) Service Center Agencies (SCA)  
Standard For Geospatial Dataset Metadata  
SCI Std 003-02 October 15, 2003

<http://www.itc.nrcs.usda.gov/scdm/docs/SPG-GeospatialDatasetFileMetadata.pdf>

- b. Description of Metadata Captured
- c. Metadata Accuracy and Completeness Assessment

## **C. Acquired Data Structure**

### 1. Geospatial Data Format

#### a. Format (raster, vector, etc.)

Raster

#### b. Format Name

MrSID 7.5' Quadrangle Mosaic

#### c. Data Extent

Gulf Coast of Alabama, Florida, Mississippi, Louisiana, and Texas

#### d. Horizontal and Vertical Resolution

Imagery was acquired at 1 ft. Ground Sample Distance (GSD) resolution.

#### e. Absolute Horizontal and Vertical Accuracy

Relative horizontal accuracy was tested by measuring points in the overlap areas between image strips. Based on the expected accuracy of GPS / IMU solution used to georeference the imagery, this relative accuracy should be representative of the absolute accuracy of the image strips.

#### f. Nominal Scale

1:24,000

#### g. Horizontal and Vertical Datum

The datum is North American Datum 1983. The vertical datum is mean sea level.

#### h. Projection

## Geographic Coordinate System

### i. Coordinate Units

Decimal Degrees

### j. Average Data Set Size

The average three band ADS40 quad mosaic is 617 megabytes.

### k. Symbology

None

## 2. Attribute Data Format

### a. Format Name

Raster data sets with no attribute information.

### b. Database Size

Not Applicable to raster data sets.

## 3. Data Model

### a. Geospatial Data Structure

ADS40 7.5' quad mosaics are MrSID.

### b. Attribute Data Structure

Not Applicable to raster data sets.

### c. Database Table Definition

Not Applicable to raster data sets.

### d. Data Relationship Definition

Not Applicable to raster data sets.

### e. Data Dictionary

Not Applicable to raster data sets.

## **D. Policies**

### 1. Restrictions

#### a. Use Constraints

Acknowledgment of the United States Army Corps of Engineers would be appreciated for products derived from these data.

Ortho imagery used to develop critical USDA datasets shall meet USDA Geospatial data standards. Service Center Standards require register with SCA data sets, such as CLU.

b. Access Constraints

None. Ortho imagery for the service center is in the public domain. FGDC guidelines for data acquisition and sharing apply. The maps must be made available to the public. Any NRI imagery is an exception.

c. Certification Issues

None.

2. Maintenance

a. Temporal Information

2005

b. Average Update Cycle

None planned.

**E. Acquisition Cost**

1. Cooperative Agreement

a. Description of Agreement

No formal agreement.

b. Status of Agreement

No formal Agreement.

2. Cost to Acquire Data

The data was acquired at no cost via download from the U.S. Army Corps of Engineers at the following ftp site:

[ftp://edcftp.cr.usgs.gov/pub/data/disaster/rita/usace\\_aerial/](ftp://edcftp.cr.usgs.gov/pub/data/disaster/rita/usace_aerial/).

### III. Integration

**A. Value Added Process**

1. Benefit to the Service Center

The integration process benefits the service center by providing and ensuring that digital ortho imagery made available to Service Centers meets SCA standards.

2. Process Model

a. Flow Diagram

None.

b. Process Description

**Acquire imagery**

- Sensor: ADS40 digital sensor
- Flight Height: 10,000' A.G.L.
- Scale: 1' G.S.D.
- Post Processing: ADS40 imagery merged with Airborne GPS and IMU data to enable georeference of the raw image strips

- Captured at 12-bit radiometric resolution and converted to 8-bit radiometric resolution
- Delivered in 1/16<sup>th</sup> quadrangle GeoTIFF format in Geographic Coordinates (Decimal Degrees), NAD83
- No feathering, tonal adjustment or enhancements made to imagery

### **NCGC Processing: Solaris**

- Unix scripts written to mosaic quadrangle sixteenths into full quadrangle Generation 2 mosaics with output of 8:1 compression MrSID files using LizardTech GeoExpress 5.0.2 on Solaris
- MrSID files opened in ArcCatalog and spatial reference defined
- Files opened in ArcMap and .aux file created
- Executable from LizardTech used to create world file (.sdw)
- Metadata .xml imported from original GeoTIFFs and modified for quad mosaics
- Metadata exported as .html
- Quad mosaics delivered via Geospatial Data Gateway and by CDROM

### **NCGC Processing: Windows**

- ERDAS Imagine 8.6 and 8.7 (service pack 2) software used to import sixteenth quadrangle georeferenced GeoTIFF files
- ERDAS Imagine 8.6 and 8.7 (service pack 2) software used to mosaic sixteenth quadrangle images into full quadrangle mosaics without feathering, tonal adjustment or image enhancements
- MrSID GeoExpress Version 5.0.2 used to create Generation 2 quad mosaics
- MrSID files opened in ArcCatalog and spatial reference defined
- Files opened in ArcMap and .aux file created
- Executable from LizardTech used to create world file (.sdw)
- Metadata .xml imported from original GeoTIFFs and modified for quad mosaics
- Metadata exported as .html
- Quad mosaics delivered via the Geospatial Data Gateway and by CDROM.

## **3. Technical Issues**

### **a. Tiling**

7.5 minute quadrangles

### **b. Compression**

The compression ratio was 8:1.

### **c. Scale**

1:24,000

### **d. Tonal Matching**

For the sake of expedience, no spectral enhancements or tonal adjustments were made in the processing of the data.

### **e. Edge-matching**

None.

#### 4. Quality Control

- a. Procedures
  - Visual quality check
- b. Acceptance Criteria
  - Product opens in ArcMap

#### 5. Data Steward

- a. Name and Organization

Currently, the data steward for the integrated data is:

USDA-Natural Resources Conservation Service  
National Cartography and Geospatial Center  
501 Felix Street, Building 23  
P. O. Box 6567  
Fort Worth, Texas 76115-0567 USA

- b. Responsibilities

Storage and access of the data.

### ***B. Integrated Data Structure***

#### 1. Geospatial Data Format

- a. Format (raster, vector, etc.)

Raster

- b. Format Name

MrSID with world file.

- c. Data Extent

Individual 7.5' Quadrangle

- d. Horizontal and Vertical Resolution

1 ft.

- e. Absolute Horizontal and Vertical Accuracy

Same as source data.

- f. Nominal Scale

Same as source data.

- g. Horizontal and Vertical Datum  
Same as source data.
- h. Projection  
Same as source data. Image tiles in quads covering two UTM zones will be converted to the predominant zone.
- i. Coordinate Units  
Same as source data.
- j. Symbology  
<http://www.itc.nrcs.usda.gov/scdm/docs/SPG-GeospatialSymbology.pdf>

## 2. Attribute Data Format

- a. Format Name  
Not Applicable to raster data sets.
- b. Database Size  
Not Applicable to raster data sets.

## 3. Data Model

- a. Geospatial Data Structure  
Compressed quad mosaic with world file.
- b. Attribute Data Structure  
Not Applicable to raster data sets.
- c. Database Table Definition  
Not Applicable to raster data sets.
- d. Data Relationship Definition  
Not Applicable to raster data sets.
- e. Data Dictionary  
Not Applicable to raster data sets.

## **C. Resource Requirements**

### 1. Hardware and Software

This is unknown at this time.

## 2. Staffing

This is unknown at this time.

### **D. Integration Cost**

#### 1. Hardware and Software

This is unknown at this time.

#### 2. Staffing

This is unknown at this time.

## **IV. Delivery**

### **A. Specifications**

#### 1. Directory Structure

##### a. Folder Theme Data is Stored In

The different versions of ortho imagery are all stored in the imagery/ortho\_imagery subfolder.

F:\geodata\ortho\_imagery

#### 2. File Naming Convention

[http://www.itc.nrcs.usda.gov/scdm/docs/SPG-GeospatialDataSetFileNaming\\_4-6-05.pdf](http://www.itc.nrcs.usda.gov/scdm/docs/SPG-GeospatialDataSetFileNaming_4-6-05.pdf)

##### a. List of Theme Files and The File Naming Convention

7.5' Quads: K\_<nnnnn>-<nn>.sid or  
K\_<USGS Quad Index # (lat/lon)>-<2 digit quad #>.sid

Example: K\_30089-C7.sid

Also R\_ is used for hurricane Rita. K is for Katrina

### **B. User Information**

#### 1. Accuracy Assessment

##### a. Alignment with Other Theme Geospatial Data

The original data was captured at a scale of 1: 6,000. This ortho imagery should be considered not sufficiently detailed for the purpose of analysis at large scales.

Alignment with the other data layers will not be perfect due to the fact that the data is captured at different scales.

##### b. Content

The data is ortho-rectified digital imagery.

#### 2. Appropriate Uses of the Geospatial Data

##### a. Display Scale

The resolution of the ADS40 compressed quad mosaics allow them to be displayed at scales substantially larger than the accuracy specifications to which they were produced. It should be noted that while “heads up” digitizing at display scales larger than 1:24,000 may allow for more accuracy of the digitized data in a relative sense, i.e., digitized line work may more accurately follow features visible on the ortho image, it will not necessarily lead to an improvement in absolute horizontal accuracy. Similar consideration should be given when using the compressed quad mosaics for map revision.

b. Plot Scale

Hardcopy plots of the compressed quad ortho mosaics can be horizontally accurate to NMAS specifications for 1:24,000 maps. Consideration should be given to the dimensional stability of the plot media as well as the geometric accuracy of the plotting device.

c. Area Calculations

Area Calculations are as accurate as the source data and capture scale and the algorithm used by ESRI software.

d. Decision Making

The data represents the results of data collection/processing for a specific U.S. Army Corps of Engineers activity and indicates the general existing conditions. As such, it is only valid for its intended use, content, time, and accuracy specifications. The user is responsible for the results of any application of the data for other than its intended purpose.

## **C. Maintenance and Updating**

### **1. Recommendations and Guidelines**

a. Original data location and structure

The full resolution image quad tile mosaics are stored at NCGC on high speed tape under a Hierarchical Storage Management (HSM) system in a robotic tape silo. This means that the imagery will be maintained and can be accessed and retrieved from tape upon request for delivery to the Service Center and online.

b. Update Cycle

None scheduled at this time.

c. Availability

Ortho imagery that meets Service Center standards will be loaded and managed in the Geospatial Data Warehouse (GDW). The ADS40 imagery is stored uncompressed at one-foot resolution.

d. Change Control

This is to be determined.