

Florida Digital Orthophotography Program Requirements

Florida Digital Orthophotography Group

August 4, 2015

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1 INTRODUCTION

Since 1972, Florida Statutes have stipulated cooperation between USGS, FDOT, and the state Water Management Districts to facilitate statewide topographic mapping efforts. Currently part of this is being done through the Florida Digital Orthophotography Program (FDOP) supported by partnerships and agreements between several state, federal, and local agencies represented by the Florida Digital Orthophotography Group (FDOG). The current FDOP consists of statewide orthophotography coverage on a three year cycle for Florida with a maximum ground sample distance of one foot.

2 PURPOSE

This document defines the minimum requirements for providing digital orthophotography products for inclusion into the FDOP. All final data will be considered a public record as defined by applicable Florida Statutes.

When a contract is awarded and before any work begins, the consultant will contact the Florida Department of Transportation Surveying and Mapping Office to request a Photographic Designation (PD) number to be assigned to the project. This number will be by FDOT to track the project through the quality assurance process before being submitted to USGS, and shall be referenced in all correspondence and project deliverables.

Any products created from oblique aerial imagery acquired during the Orthophotography project imagery collection are beyond the scope of this document.

All work performed must be in accordance with the ***Standards of Practice Chapter 5J-17, F.A.C.***, pursuant to ***Chapter 472, Florida Statutes***.

3 ABBREVIATIONS / DEFINITIONS

- **ASPRS** – American Society for Photogrammetry & Remote Sensing
- **CADD** - Computer Aided Design & Drafting
- **DEM** – Digital Elevation Model
- **ESRI** - Environmental Systems Research Institute
- **FGDC** – Federal Geographic Data Committee
- **FIPS** – Federal Information Processing Standards
- **FDOG** – Florida Digital Orthophotography Group
- **FDOP** – Florida Digital Orthophotography Program
- **GSD** – Ground Sample Distance
- **IMU** - Inertial Measurement Unit
- **LiDAR** - Light Detection and Ranging
- **LAS** – A binary file standard supported by ASPRS for storing point location and attribute information primarily used for LiDAR data.

- **NSSDA** – National Standard for Spatial Data Accuracy
- **Orthophoto** – *same as Orthophotograph*
- **Orthophotograph** – A photographic copy, prepared from a perspective photograph, in which the displacements of images due to tilt and relief have been removed. (Source: American Congress on Surveying and Mapping and the American Society of Civil Engineers. *Definitions of Surveying and Associated Terms*. Library of Congress Catalogue Card Number 72-76807. Washington 1972, 1978.
- **Orthophotomosaic** – An assembly of orthophotographs forming a uniform-scale mosaic. (Source: American Congress on Surveying and Mapping and the American Society of Civil Engineers. *Definitions of Surveying and Associated Terms*. Library of Congress Catalogue Card Number 72-76807. Washington 1972, 1978.
- **Orthorectification** – A special case of image resampling whereby the effects of image perspective and relief displacement are removed so that the resulting orthoimage has uniformly scaled pixels, resembling a planimetric map. (Source: American Society for Photogrammetry and Remote Sensing *Manual of Photogrammetry Fifth Edition*, 2004, page 963)
- **Photogrammetry** - The science or art of obtaining reliable measurements by photography. (Source: American Congress on Surveying and Mapping and the American Society of Civil Engineers. *Definitions of Surveying and Associated Terms*. Library of Congress Catalogue Card Number 72-76807. Washington 1972, 1978.
- **RMSE** – Root Mean Square Error
- **USft** – United States Survey Feet
- **USGS** - United States Geological Survey
- **XML** – Extensible Markup Language

4 PROJECT AREA

The Agency will provide an outline of the project area to be mapped along with a collection of 5000 by 5000 foot tiles (cells) for this area using the FDOP predefined grid. This will serve as the final uniform tiling scheme for the seamless Orthophoto mosaic and topographic data deliverables.

5 ORTHOPHOTO SPECIFICATIONS

5.1 Sensor

All imagery shall be collected using a digital aerial sensor with current USGS type certification. The sensor must also have a documented bore-sight calibration performed within six months of image acquisition.

5.2 Image Spatial Resolution

Based on contract requirements, the Consultant will deliver images that have been re-sampled to a resolution of either 0.5 or 1.0 feet per pixel. The original raw imagery must have a Ground Sample Distance (GSD) less than or equal to the desired final resolution of the orthoimagery. Orthoimagery that has been resampled to a higher resolution than the original raw imagery GSD will NOT be accepted.

5.3 Horizontal and Vertical Datum

Unless otherwise requested the Orthophotography and other topographic products shall be referenced to the North American Datum of 1983 2011. The map projection referenced shall be to the appropriate Florida State Plane Coordinate System in units of US Survey Feet.

Orthophotography and other topographic products shall be referenced to the North American Vertical Datum of 1988 (NAVD 88), in units of US Survey Feet.

5.4 Horizontal Accuracy

The horizontal accuracy of either 0.5 foot resolution or 1.0 foot resolution final Orthophotography products shall be determined using well defined photo identifiable check points. Computed local horizontal accuracy shall meet or exceed 4.9 feet at the 95% confidence interval as specified in the FGDC "*Geospatial Positioning Accuracy Standards, Part 3: National Standard for Spatial Data Accuracy*". A minimum of thirty (25) independent image checkpoints within the project area will be used for verification. Check points will be distributed throughout the dataset.

5.5 Digital Elevation Model

A Digital Elevation Model adequate to support accuracy specifications identified for this project must be created to accurately orthorectify photographic imagery.

When available the Agency will provide DEM(s) or LiDAR data if available from past projects. The Consultant is responsible for evaluating the accuracy of the DEMs, and when necessary processing additional break lines necessary to accurately orthorectify photographic imagery.

The Consultant will submit information in the final survey report and metadata which documents the source, enhancements made, and final accuracy of the DEMs utilized for the Orthophoto mapping project.

Additionally, if LiDAR data is acquired as part of the project, the classified scan data must be provided in LAS file format as per ASPRS LAS Specification 1.4 with associated metadata.

6 IMAGE ACQUISITION

6.1 Ground Control

Sufficient ground control shall be used to support 0.5 feet Ground Sample Distance (GSD) spatial resolution Orthophoto mapping for the project. All newly established ground control as well as the check points necessary to meet the requirements of the Florida Digital Base Orthophotography Group, see *Attachment A*.

The Consultant will coordinate with Agency staff in planning ground control surveys and methodology used for all horizontal and vertical control surveys.

6.2 Flight Season

The specified flight season will be from October 1st through March 15th. To the greatest extent possible imagery should be obtained prior to January 30th. Imagery collected outside of this flight season will require written approval from contracting agency.

6.3 Image Quality

All images will be obtained under cloud free conditions and will be free of obscuring haze, smoke or other atmospheric conditions. Radiometric and color balancing of the imagery is described in Section 7: *Orthophoto Deliverables*. All images must be collected with a sun angle no less than 30° .

Imagery shall be acquired at a density in the “high-rise” urban areas such that all road networks are clearly visible and that buildings show no signs of excessive tilt or lean.

6.4 Historical Images

To maintain consistency between images collected during different years, historical examples of imagery shall be reviewed. If applicable color balancing should be performed that is consistent with previous FDOP county imagery.

7 ORTHOPHOTO DELIVERABLES

All deliverables will be the property of the Contracting Agency and are considered public record. Written permission from the Agency must be obtained to release data to any party prior to final publication. The Consultant will deliver only the Ortho-rectified natural color and if requested near infrared imagery. Stereoscopic panchromatic imagery will be collected but not delivered unless specifically requested by the Agency. The Consultant will keep a copy of the original data for a period of five (5) years and must contact the Agency before destroying the data.

The Consultant will document all data deliveries with an itemized transmittal letter.

7.1 File Formats and Image Types

Clarity and quality of the imagery is of the highest importance. Imagery will be delivered as uncompressed GeoTIFF images with valid projection header information. Refer to *ATTACHMENT B – REQUIRED TIFF AND GEOTIFF TAGS AND KEYS AND SAMPLE VALUES* for details. One GeoTIFF file per 5000 x 5000 foot tile is required.

- a) *Natural Color Imagery* – The natural color, RGB, bands will be color balanced across the entire study area to the greatest extent possible to allow viewing of the image tiles as a visually seamless mosaic. Care should be taken during radiometric processing to avoid loss of detail in shadows and overexposure on bright surfaces such as bare ground and light colored building roofs.
- b) *Color Infrared Imagery* – The color infrared bands will be radiometrically processed in a manner that preserves original image characteristics to the greatest extent practical. Systematic radiometric corrections to reduce sun angle and sensor variations are desired. Corrections for seasonal variations in ground cover are not to be done, however, care should be taken to ensure appropriate coloration of different vegetation types (e.g. deciduous, evergreen, etc.) is evident.

All orthoimages will be delivered according to the tiling scheme defined in *Section 4: Project Area*. Tiles will be contiguous and non-overlapping and will be suitable for creating a seamless image mosaic that includes no data void cells or gaps. Tile naming convention is as follows:

YYYY_NNNNNN.TIF (*4Band Imagery*)
YYYY_NNNNNN_RGB.TIF (*Natural Color Imagery*)
YYYY_NNNNNN_CIR.TIF (*Color Infrared Imagery*)

Where:

YYYY = Ending year of the flying season that typically ends in March.

NNNNNN = Appropriate tile (cell) index number values found in the **ProjectName**_Ortho_Project_Area shapefile.

The following examples represent the three color variations of the same Orthophoto image tile that was acquired during the 2013– 2014 flying season.

2014_200001.tif (*4Band Image Tile*)
2014_200001_RGB.tif (*Natural Color Image Tile*)
2014_200001_CIR.tif (*Color Infrared Image Tile*)

7.2 Metadata

A metadata file must be delivered for each GeoTIFF image file, the DEM used for OrthoPhoto production, and the cutline feature class in an ArcCatalog compatible XML format. Templates for each deliverable that requires metadata are found in *ATTACHMENT C – METADATA TEMPLATES*. The templates are also available in an XML file delivered under separate cover.

Metadata must be compliant with the Federal Geographic Data Committee's (FGDC) Content Standard for Spatial Metadata. All metadata must pass through the USGS metadata parser at <http://geo-nsdi.er.usgs.gov/validation/> with no errors.

Metadata and the image collection date(s) must apply to each individual tile. The image Collection Date(s) field must be populated.

7.3 Image Cutline Feature Class

The Consultant will include a file “*ProjectName*_Cutlines” in ESRI Shape file format, containing a feature class of non-overlapping polygons with no data voids for the project area. Each polygon will delineate image capture dates used to seam together photographs for the production of orthophotography.

The feature class should conform to project boundary, and must have one date field named FLIGHTDATE that identifies the date the imagery was collected. The FLIGHTDATE attribute field should be populated as YYYYMMDD. Metadata must accompany the image cutline feature class.

7.4 Survey Report

The Consultant Professional Surveyor and Mapper (PSM) will prepare a survey report that documents all processes and is compliant with relevant Minimal Technical Standards for Professional Surveying and Mapping done in Florida. The Report of Orthophotography Survey shall at a minimum include the following items:

- Project title and reference number
- Name and address of corporation (certificate of authorization number)
- Surveyor in responsible charge (contact information)
- Abbreviations, definitions; data sources; etc.
- Final deliverable listing of files stating filename with extension and delivery date in the appendix of the survey report.
- Introduction, purpose, objectives
- Scope of work
- Reference to ground Control Survey by title, survey date, corporation, and certifying Surveyor and Mapper.
- Describe all equipment, software, etc.
- Imaging sensor description, specifications, USGS Type Certification, and current bore sight calibration report.

- Airborne GPS report
- Aerial triangulation control coordinates and aerial triangulation blocks along with statistical summaries
- Check point accuracy analysis according to the FGDC NATIONAL STANDARD FOR SPATIAL DATA ACCURACY (FGDC-STD-007.3-1998)
- Digital Orthophoto image acquisition dates and logs
- Digital Orthophoto image production specifications
- Digital elevation model acquisition (identify source and accuracy)
- If Light Detection and Ranging (LiDAR) data is collected then the following items shall be included.
 1. LiDAR data acquisition dates and logs
 2. LiDAR sensor description and calibration report
 3. LiDAR specifications and procedures
 4. LiDAR accuracy analysis according to the FGDC NATIONAL STANDARD FOR SPATIAL DATA ACCURACY (FGDC-STD-007.3-1998)
- Digital orthophotography image accuracy NSSDA analysis according to the FGDC NATIONAL STANDARD FOR SPATIAL DATA ACCURACY (FGDC-STD-007.3-1998)
- List the field and office personnel
- Professional Surveyor and Mapper certification will include the following:

“I CERTIFY TO THE BEST OF MY KNOWLEDGE AND BELIEF THAT THIS DIGITAL ORTHOPHOTOGRAPHY MAP MEETS OR EXCEEDS THE CONTRACT REQUIREMENTS AND THE MINIMUM TECHNICAL STANDARDS APPLICABLE FOR THIS WORK, AS SET FORTH IN CHAPTER 5J-17, F.A.C., PURSUANT TO CHAPTER 472, FLORIDA STATUTES
- FGDC Metadata for each image tile in digital XML file format.
- Report will include a map overlay which will display the following items:
 1. All horizontal and vertical ground control with identify which points were constrained during aerial triangulation and which points were used for check during NSSDA analysis.
 2. Aerial triangulation blocks.
 3. Digital orthophotography cut lines and dates associated with the strips
 4. Digital orthophotography tile limits and layout
 5. LiDAR quality control locations and accuracy (if applicable)
 6. Base map features (USGS quad, county boundaries, major roads, major hydrography / water bodies, township/range lines, basin boundaries, cities)

The Consultant will deliver two (2) hardcopies of this report with the following final digital media deliverables.

Final Digital Media Submittal:

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- Digital copy of the Orthophotography Survey report
- Digital copy of the Control Survey report.
- Orthophotography image tiles
- Metadata XML file for each image tile
- Final surface model used to rectify photography
- Classified LiDAR data files (*.LAS) if collected
- Image checkpoints used for accuracy testing in Shape File (point) format and excel format. The minimum required fields are listed in *TABLE 1 – SURVEY CHECK POINTS FIELD PROPERTIES*.
- Digital files used for Survey Report map overlays in ESRI Shape file format:
 1. All horizontal and vertical ground control with identify which points were constrained during aerial triangulation and which points were used for check during NSSDA analysis.
 2. Aerial triangulation blocks
 3. Digital orthophotography cut lines and dates associated with the photographs
 4. Digital orthophotography tile limits and layout
 5. Digital orthophotography Control Point Locations
 6. LiDAR QC accuracy locations (if applicable)
 Base map features

Final submittals will be delivered on a single portable external USB computer drive and accompanied by an itemized transmittal letter. All deliverables will become the property of the Agency. The drive shall be labeled on the outside with the following information:

- Project Title
- Purchase Order Number
- Work Order Name
- Work Order Number
- Consultant Name
- Project Manager’s Name

TABLE 1 – SURVEY CHECK POINTS FIELD PROPERTIES

Field Name	Data Type	Description
CONTROLPTNAME	Text	Control point designation.
LATITUDE	Double	Geographic Y-coordinate specifying vertical position.
LONGITUDE	Double	Geographic X-coordinate specifying horizontal position.
ELLIPSOIDHEIGHT	Double	Height above or below the reference ellipsoid (meters).
NORTHING	Double	State Plane Y-coordinate in US Survey Feet.
EASTING	Double	State Plane X-coordinate in US Survey Feet.
NAVD88HEIGHT	Double	Orthometric height in US Survey Feet.
DESCRIPTION	Text	Additional information or details pertaining to the control point.

8 ORTHOPHOTO PROJECT SCHEDULE

All final deliverables must be received within one hundred twenty (120) calendar days from the successful collection of aerial imagery. The Consultant will submit a proposed project schedule. The Consultant will notify the Agency when aerial images have been collected.

Ground Control Requirements for Florida Statewide Base Digital Orthophotography Program

Purpose:

The purpose of this document is to specify the requirements for a geodetic control survey to support 0.5 and 1 foot ground sample distance resolution county aerial Orthophoto mapping. The positional accuracy required for both of these imagery resolutions is 4.9 feet at the 95% confidence level.

1. All surveying and mapping work performed shall meet the ***Standards of Practice Chapter 5J-17, F.A.C., pursuant to Chapter 472, Florida Statutes.***
 - Global Positioning System (GPS) techniques shall be used to establish horizontal and vertical positions on targeted and/or well-defined photo identifiable points that will be used as control for aerial photogrammetric mapping. New photo control point positions shall be identified in the field by a survey mark.
 - When aerial panels are used, the vertical offset from top of mark to the panel surface shall be measured and recorded.
 - In rare circumstances where the photo identifiable control point cannot be occupied directly, a horizontal offset distance of less than 2 feet from the occupied survey mark may be used. Field survey measurements of sufficient precision must be collected and recorded to allow accurate coordinate computation of the photo identifiable point from the offset mark.
2. All established GPS control shall be referenced to the current FDOT realization of the NAD83 based on redundant ties to the Florida Permanent Reference network (FPRN). The photogrammetric ground control network will meet or exceed the 10-centimeter Local Accuracy Standard as set forth by the FGDC “*Geospatial Positioning Accuracy Standards, Part 2: Standards for Geodetic Networks*”.
3. Sufficient (minimum four) published NAVD88 benchmarks shall be included in the control network to insure accurate elevations can be computed from GPS ellipsoid values through local adjustment using the latest NGS geoid model. The Local vertical positional accuracy required is 10 centimeters.
4. Where conditions dictate differential leveling may be used to establish elevations on photo control points from the nearest ground control network station or published NSRS vertical station within a 5 mile radius from the photo control point. The differential leveling procedures used shall meet or exceed ***Standards of Practice*** for vertical control accuracy.
5. Proposed control point locations may be moved up to 500 feet from their original proposed locations to insure safety, and if the proposed point is ambiguous or no longer exists. Such control points shall be documented as moved.

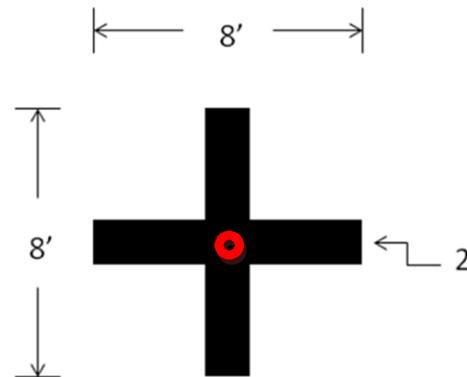
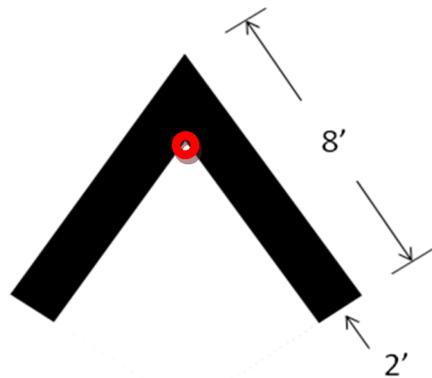
6. A field sketch with survey date, GPS satellite visibility and weather conditions at the time of GPS data collection shall be prepared for each control point site.
7. Digital photo(s) shall be taken showing the exact location of the control point, preferably while the point is occupied by the GPS unit setup. Digital photo filenames shall include the control point name.
8. Submittal Items:
 - A. The Professional Surveyor and Mapper (PSM) will prepare a certified report of Control Survey that shall at a minimum include the following items:
 - Project title and reference number
 - Name and address of corporation (certificate of authorization number)
 - Surveyor in responsible charge (contact information)
 - Abbreviations; data sources; etc.
 - Introduction, purpose and objective
 - Description and scope of work
 - Describe equipment, software, etc.
 - Describe the accuracy standards and specifications, procedures and methodology for establishing ground control
 - Describe and list the geodetic control (existing and newly-established), displaying the horizontal and vertical coordinates, Datum used, Geoid model and error estimates (95% confidence level)
 - Accuracy reporting will be according to FGDC geospatial accuracy standards: Report the horizontal and vertical (heights) accuracies (local and network) according to the FGDC STANDARDS FOR GEODETIC NETWORKS (FGDC-STD-007.2-1998)
 - List the field and office personnel
 - Date of field survey (Last date of field measurements).
 - Describe monumentation recovered and set
 - Professional Surveyor and Mapper certification will include the following: **“I CERTIFY TO THE BEST OF MY KNOWLEDGE AND BELIEF THAT THIS CONTROL SURVEY MEETS OR EXCEEDS THE CONTRACT REQUIREMENTS AND STANDARDS OF PRACTICE APPLICABLE FOR THIS WORK, AS SET FORTH IN CHAPTER 5J-17, F.A.C., PURSUANT TO CHAPTER 472, FLORIDA STATUTES**
 - Report will include a map overlay which will display the following items:
 - GPS baseline network, indicate repeated measurements
 - Existing horizontal and vertical geodetic control
 - Newly-established photogrammetric control
 - Base map features (county boundaries, major roads, major hydrography / water bodies, township/range lines, cities)

B. Digital Media Submittal on CDs/DVDs shall contain:

- Digital copy of the Control Survey report
- Existing geodetic control recovery/to-reach descriptions, sketches, field notes, photographs, etc
- Newly-established photogrammetric control location descriptions, sketches, field notes, photographs, etc
- Copies of Global Positioning System (GPS) data logs and a listing of GPS occupations
- All GPS data observed and produced during the survey (digital format), including the raw observation data, processed baselines, loop closures and least squares adjustments (free and fixed)
- A Microsoft EXCEL spreadsheet file list of final control with datum header information along with point name, geographic (Latitude, Longitude), grid (State Plane Zone Northing and Easting), and elevation values for control points. Grid coordinates and elevations shall be in units of US survey feet. Any horizontal and vertical mark offsets measured shall be identified and applied to the aerial panel or photo identifiable feature position and/or surface (poles shall use ground surface at base of pole). Offset measurements shall be included to verify computations. See example in *CONTROL TABLE EXAMPLE*.
- Sketches and digital pictures of photo control point sites identifying measured point location and type of mark including target size and material if applicable.

Aerial Panel Dimensions (if required)

 = Location of survey mark.



CONTROL TABLE EXAMPLE

FINAL ADJUSTED HORIZONTAL AND ORTHOMETRIC HEIGHT VALUES FOR MARION COUNTY (PD6027) POST FLIGHT PHOTO POINT

UNITS ARE US Survey Feet (USft)

HORIZONTAL DATUM IS NAD 83 (2011)

STATE PLANE ZONE IS FLORIDA WEST ZONE 0902

ORTHOMETRIC HEIGHT DATUM IS NAVD 88

ALL CONTROL STATION VALUES ARE DERIVED BY STATIC GPS OBSERVATIONS FROM PUBLISHED NGS CONTROL

PHOTO_ID	GPS Control Station - Geographic			GPS Control Station - USft			Offset from GPS Station to Photo ID Point - USft			FINAL Photo ID Control - USft		
	LATITUDE	LONGITUDE	ELLIP_HGT (meters)	NORTHING	EASTING	ORTHO_HGT	Offset - North	Offset - East	Offset - Vert	NORTHING	EASTING	ORTHO_HGT
D510S010	29 29 44.73172	-82 24 24.26473	1.757	1876786.20	526773.97	97.18	0.00	0.50	0.00	1876786.20	526774.47	97.18
D510S011	29 28 42.07552	-82 3 20.32535	-4.497	1870232.35	638460.51	77.18	-0.50	-0.75	0.00	1870231.85	638459.76	77.18
D510S012	29 30 29.98811	-81 51 49.10517	10.530	1881156.88	699540.72	127.11	0.00	0.00	0.00	1881156.88	699540.72	127.11
D510S013	29 19 32.46883	-81 58 11.18511	-5.832	1814716.87	665798.44	72.96	0.00	0.00	1.00	1814716.87	665798.44	73.96
D510S014	29 21 52.50874	-81 44 25.40237	-16.367	1828952.74	738861.52	39.27	0.00	0.00	0.00	1828952.74	738861.52	39.27
D510S015	29 17 40.65095	-81 39 9.97229	-27.655	1803585.22	766847.02	2.34	0.50	0.30	0.50	1803585.72	766847.32	2.84

ATTACHMENT B – REQUIRED TIFF AND GEOTIFF TAGS AND KEYS AND SAMPLE VALUES

TIFF Tags Required

<u>Tag Name</u>	<u>Decimal</u>	<u>Hex</u>	<u>Type</u>	<u>Sample Value</u>
ImageWidth	256	100	Short or Long	5000
ImageLength	257	101	Short or Long	5000
BitsPerSample	258	102	Short	8 8 8
Compression	259	103	Short	1
PhotometricInterpretation	262	106	Short	2
Orientation	274	112	Short	1
StripOffsets	273	111	Short or Long	8 510008 . . .
SamplesPerPixel	277	115	Short or Long	3
RowsPerStrip	278	116	Short or Long	34
StripByteCounts	279	117	Short or Long	510000 510000 . . .
ImageDescription	270	10E.H	ASCII	Agency Digital Orthophoto
DocumentName	269	10D.H	ASCII	<Cell Number> <Zone> <State>

Tiff Tags Defined by GeoTIFF:

<u>Tag Name</u>	<u>Decimal</u>	<u>Hex</u>	<u>Type</u>	<u>Sample Value</u>
ModelPixelScaleTag	33550	830E	Double	1.0 1.0 0
ModelTiePointTag	33922	8482	Double	0 0 0 525000 188000 0
GeoAsciiParamsTag	34737	87B1	ASCII	Agency One Foot Resolution <start flight date> - <end flight date> NAD 1983 (2011) State Plane Florida West FIPS 0902 Feet
GeoKeyDirectoryTag	34735	87AF	Short	1 1 0 6 1024 0 1 0 1025 0 1 1 1026 34737 78 0 3072 0 1 26959 3073 34737 53 78 3076 0 1 9003

GeoKeys Defined by GeoTIFF:

<u>Tag Name</u>	<u>Decimal</u>	<u>Hex</u>	<u>Type</u>	<u>Sample Value</u>
GTMModelTypeGeoKey	1024	400	Short	0
GTRasterTypeGeoKey	1025	401	Short	1
GTCitationGeoKey	1026	402	ASCII	Agency One or Half Foot Resolution <start flight date> - <end flight date>
ProjectedCSTypeGeoKey	3072	C00	Short	2882
PCSCitationGeoKey	3073	C01	ASCII	NAD 1983 (2011) State Plane Florida West FIPS 0902 Feet
ProjLinearUnitsGeoKey	3076	C04	Short	9003

ATTACHMENT C – METADATA TEMPLATES

ORTHOPHOTO METADATA TEMPLATE

Identification Information:

Citation:
Citation information:
Originators: ORTHOPHOTO MAPPING VENDOR

Title:
ORTHOPHOTO TILE NUMBER

Publication date: 2008

Series information:
Series name: Orthophotos - Year
Issue identification: Area Mapped from Contract

Publication information:
Publication place: Agency Address
Publisher: Agency

Larger work citation:
Citation information:
Originators: ORTHOPHOTO MAPPING VENDOR

Title:
ORTHOPHOTO TILE NUMBER

Publication date: 2008
Publication time: Unknown

Series information:
Series name: Orthophotos - Year
Issue identification: Contract Area Mapped

Publication information:
Publication place: Agency Address
Publisher: Agency

Description:
Abstract:
The abstract should simply be a summary of what the data is and when and where it was collected. Should include a range of dates for the project area, resolution, spectral range (RGB, CIR, 4-Band), pixel depth, contract number and specifications, horizontal accuracy

Purpose:
This section should describe why the dataset was created and how it should be used.

Supplemental information:

This section should be populated if there are additional details that are relevant to the identification and purpose of the dataset. Be sure to note land only tiles where large water bodies are not captured.

<Mosaicked>: Yes
<Color Balanced>: Yes
<Geo Referenced>: Yes
<Image File Format>: GeoTIFF
<Unprocessed Image Data Available>: No
<Bit Depth>: 32
<Spatial Resolution>: 1-Foot
<Sensor>: ADS40
<Spectral Range>: RGB
<Spectral Range>: CIR
<Stereo Acquisition>: No
<Environmental Constraints>:
 <Environmental Constraint Description>: All images will be obtained under cloud free conditions and will be free of obscuring haze, smoke or other atmospheric conditions. All images are collected between 10:00 AM to 2:30 PM to minimize shadows.
 <Environmental Constraint Clouds>: 0%
 <Environmental Constraint Smoke>: 0%
 <Environmental Constraint Haze>: 0%
 <Environmental Constraint Sun Angle>: greater than 30 degrees
 <Environmental Constraint Turbidity>: Not Applicable
<Image Tidal Datum>: Not Applicable

Language of dataset: en

Time period of content:
Time period information:
Single date/time:
Calendar date: 20040101

Currentness reference:
Ground condition

Status:
Progress: Complete
Maintenance and update frequency: Annually

Spatial domain:
Bounding coordinates:
***West bounding coordinate:** REQUIRED: Western-most coordinate of the limit of coverage expressed in longitude.
***East bounding coordinate:** REQUIRED: Eastern-most coordinate of the limit of coverage expressed in longitude.
***North bounding coordinate:** REQUIRED: Northern-most coordinate of the limit of coverage expressed in latitude.

***South bounding coordinate:** REQUIRED: Southern-most coordinate of the limit of coverage expressed in latitude.

Keywords:

Theme:

Theme keywords: Orthophoto, Orthoimage

Theme keyword thesaurus: Aerial Imagery

Place:

Place keywords: Florida, County

Place keyword thesaurus: FL

Access constraints: None

Use constraints:

The Orthophotos were collected under the supervision of a licensed Professional Surveyor and Mapper. Use of these data requires a general understanding of GIS and spatial data.

Point of contact:

Contact information:

Contact organization primary:

Contact organization: Agency

Contact address:

Address type: mailing and physical address

Address:

123 Agency Address

City: City

State or province: State

Postal code: Zip

Contact voice telephone: (555) 555-5555

Contact facsimile telephone: (555) 555-5555

Hours of service: 8:00 a.m. to 5:00 p.m.

Data set credit:

Agency and Mapping Vendor

Data Quality Information:

Attribute accuracy:

Attribute accuracy report:

See Horizontal and Vertical Accuracy reports. There are no Attributes in this data set.

Logical consistency report:

The mapping vendor should provide the QC process used to check the data.

Agency QC steps.

Completeness report:

Orthophotos are visually inspected for completeness to ensure that no gaps or image misplacements exist within and between adjacent images. These images are derived by mosaicking multiple images to ensure complete coverage of the project area.

Positional accuracy:

Horizontal positional accuracy:

Horizontal positional accuracy report:

Orthophoto Mapping will meet or exceed a verified horizontal accuracy of **4.90 feet at the 95% confidence interval as specified in the FGDC "Geospatial Positioning Accuracy Standards, Part 3: National Standard for Spatial Data Accuracy" (NSSDA)**. A minimum of thirty (25) independent image checkpoints within the project area will be used for verification. Check points will be distributed so that points are spaced at intervals of at least ten (10) percent of the diagonal distance across the dataset and at least twenty (20) percent of the points are located in each quadrant of the dataset. The Consultant is not expected to correct for "building lean" in urban areas. For more information please see project related minimum technical standards report.

Quantitative horizontal positional accuracy assessment:

Horizontal positional accuracy value: 4.9 feet

Horizontal positional accuracy explanation:

Meets or Exceeds National Standard for Spatial Data Accuracy

Vertical positional accuracy:

Vertical positional accuracy report:

No vertical accuracy analysis required for the orthophotos.

Lineage:

Source information:

Source citation:

Citation information:

Originators: Mapping Vendor

Title:

Ground Control Survey Report

Publication date: 2004

Series information:

Series name: Ground Control

Issue identification: Area Mapped and Year

Publication information:

Publication place: Location of Mapping Vendor

Publisher: Mapping Vendor

Larger work citation:

Citation information:

Originators: Mapping Vendor

Title:
Ground Control Survey Report

Publication date: 20040101

Series information:
Series name: Ground Control
Issue identification: Area Mapped and Year

Publication information:
Publication place: Location of Mapping Vendor
Publisher: Mapping Vendor

Type of source media: disc
Source citation abbreviation:
Ground Control
Source contribution:
Horizontal and vertical control was used to establish positions and elevations for reference and correlation purposes and as input to the aerotriangulation process. Control consists of Airborne GPS/IMU and ground control points for ground reference.

Source time period of content:
Time period information:
Single date/time:
Calendar date: 2004

Source currentness reference:
ground condition

Source information:
Source citation:
Citation information:
Originators: Mapping Vendor

Title:
Digital Imagery Acquisition

Publication date: 2004

Series information:
Series name: Aerial Acquisition
Issue identification: Area Mapped and Year

Publication information:
Publication place: Location of Mapping Vendor
Publisher: Mapping Vendor

Larger work citation:
Citation information:

Originators: Mapping Vendor

Title:

Digital Imagery Acquisition

Publication date: 2004

Series information:

Series name: Aerial Acquisition

Issue identification: Area Mapped and Year

Publication information:

Publication place: Location of Mapping Vendor

Publisher: Mapping Vendor

Source scale denominator: 2400

Type of source media: disc

Source citation abbreviation:

Aerial Imagery

Source contribution:

Sensor used and Altitude (agl) flown

Source time period of content:

Time period information:

Range of dates/times:

Beginning date: 20040101

Ending date: 20040315

Source currentness reference:

Dates of Acquisition

Source information:

Source citation:

Citation information:

Originators: DEM provided by Agency

Title:

Digital Elevation Model

Publication date: 2004

Series information:

Series name: DEM Project Name

Issue identification: Area Mapped and Year

Publication information:

Publication place: Location of Mapping Vendor

Publisher: Mapping Vendor

Larger work citation:

Citation information:
Originators: DEM provided by

Title:
Digital Elevation Model (DEM)

Publication date: 2004

Series information:
Series name: DEM
Issue identification: Area Mapped and Year

Publication information:
Publication place: Location of Mapping Vendor
Publisher: Mapping Vendor

Type of source media: disc
Source citation abbreviation:
DEM
Source contribution:
Site the Digital Elevation Models (DEM) or LiDAR data used to support the rectification process for the project level. Agency will provide available DEMs.

Source time period of content:
Time period information:
Multiple dates/times:
Single date/time:
Calendar date: 2004
Single date/time:
Calendar date: 2005

Source Currentness reference:
Ground condition

Process step:
Process description:
Description of the how orthophoto was created

Process date: 2004

Source used citation abbreviation:
Ground Control
Source used citation abbreviation:
Aerial Imagery
Source used citation abbreviation:
DEM

Process contact:
Contact information:
Contact organization primary:

Contact organization: Mapping Vendor

Contact address:

Address type: mailing and physical address

Address:

123 Orthophoto Lane

City: Anywhere

State or province: FL

Postal code: 11111

Contact voice telephone: 555-5555

Hours of service: 8:00 a.m. to 5:00 p.m.

Cloud cover: 0%

Spatial Data Organization Information:

***Direct spatial reference method:** Raster

Raster object information:

Row count: 5000

Column count: 5000

Raster object type: Pixel

Spatial Reference Information:

Horizontal coordinate system definition:

Coordinate system name:

Projected coordinate system name:

NAD_1983_2011_StatePlane_Florida_West_FIPS_0902_Feet

Geographic coordinate system name: GCS_North_American_1983_2011

Planar:

Map projection:

Map projection name: Transverse Mercator

Transverse Mercator:

Scale factor at central meridian: 0.99994118

Longitude of central meridian: -82.000000

Latitude of projection origin: 24.333333333

False easting: 656166.66666667

False northing: 0.0000000000

Planar coordinate information:

***Planar coordinate encoding method:** row and column

Coordinate representation:

Abscissa resolution: 1

Ordinate resolution: 1

Planar distance units: survey feet

Geodetic model:

Horizontal datum name: North American Datum of 1983

Ellipsoid name: Geodetic Reference System 80

Semi-major axis: 6378137.000000

Denominator of flattening ratio: 298.257222

Vertical coordinate system definition:

Altitude system definition:

Altitude datum name: North American Vertical Datum of 1988

Altitude resolution: 0.1

Altitude distance units: feet

Altitude encoding method: Explicit elevation coordinate included with horizontal coordinates

Entity and Attribute Information:

Overview description:

Dataset overview:

There is no attribute information

Entity and attribute overview:

None

Entity and attribute detail citation:

None

Distribution Information:

Distributor:

Contact information:

Contact organization primary:

Contact organization: Agency

Contact address:

Address type: mailing and physical address

Address:

Agency Address

City: City

State or province: State

Postal code: Zip

Contact voice telephone: (555) 555-5555

Hours of service: 8:00 am - 5:00 pm

Resource description: Agency provided

Distribution liability:

Agency provided

Standard order process:
Digital form:
Digital transfer information:
Format name: TIFF
Format version number: 1.0
Format specification:
GeoTIFF
Format information content:
GeoTIFF
File decompression technique: no compression applied
Transfer size: 92

Digital transfer option:
Offline option:
Offline media: External Hard Drive
Recording format: GeoTIFF

Fees: \$0
Ordering instructions:
Contact Agency
Turnaround: 48-72 hours

Custom order process:
Agency provided
Technical prerequisites:
Agency provided

Metadata Reference Information:

***Metadata date:** 20090609

Metadata contact:
Contact information:
Contact organization primary:
Contact organization: Agency

Contact address:
Address type: mailing and physical address
Address:
Agency Address
City: City
State or province: State
Postal code: Zip

Contact voice telephone: 555) 555-5555
Contact facsimile telephone: 555) 555-5555

Hours of service: 8:00 a.m. to 5:00 p.m.

CUTLINE FEATURE CLASS METADATA TEMPLATE

Identification Information:

Citation:

Citation information:

Originators: Mapping Vendor

Title:

PROJECT_AREA_ONE_FOOT_CUTLINES

Publication date: 2009

Geospatial data presentation form: vector digital data

Series information:

Series name: Cutline Feature Class - 2009

Issue identification: Project Area

Publication information:

Publication place: Agency Address

Publisher: Agency

Larger work citation:

Citation information:

Originators: Mapping Vendor

Title:

PROJECT_AREA_ONE_FOOT_CUTLINES

Publication date: 2009

Series information:

Series name: Cutline Feature Class - 2009

Issue identification: Project Area

Publication information:

Publication place: Agency Address

Publisher: Agency

Description:

Abstract:

This feature class accompanies the orthophotos for the project area. The polygons delineate image capture dates used to seam together flightlines for the production of orthophotos. The flight dates for the project area were from (insert date) to (insert date).

Purpose:

The purpose of this feature class is to identify the flight dates for the project area.

Supplemental information:

Include any additional information as necessary.

Time period of content:
Time period information:
Range of dates/times:
Beginning date: 20090101
Ending date: 20090315

Currentness reference:
ground condition

Status:
Progress: Complete
Maintenance and update frequency: Annually

Spatial domain:
Bounding coordinates:

Keywords:
Theme:
Theme keywords: Flight Dates, Seamline, Cutline
Theme keyword thesaurus: none

Place:
Place keywords: Florida
Place keyword thesaurus: none

Access constraints: None
Use constraints:
Use of these data requires a general understanding of GIS.

Point of contact:
Contact information:
Contact organization primary:
Contact organization: Agency

Contact address:
Address type: mailing and physical address
Address:
Agency Address
City: City
State or province: State
Postal code: Zip
Country: USA

Contact voice telephone: (555) 555-5555
Contact facsimile telephone: (555) 555-5555

Hours of service: 8:00 a.m. to 5:00 p.m.
Data set credit:

Agency and Mapping Vendor

Data Quality Information:

Logical consistency report:

The mapping vendor should provide the QC process used to check the data.

Agency QC Process:

The cutline feature class is checked to make sure there are no overlapping polygons or data voids within the project area. The feature class is also checked to make sure it conforms to the project boundary.

Completeness report:

The cutline feature class is visually inspected for completeness to ensure that no gaps or data voids are found within the project boundary.

Positional accuracy:

Horizontal positional accuracy:

Horizontal positional accuracy report:

Horizontal accuracy is +/- 5.06 feet at the 95% confidence level as defined by the FGDC Geospatial Positional Accuracy Standards, Part 3: NSSDA.

Quantitative horizontal positional accuracy assessment:

Horizontal positional accuracy value: 4.9 feet

Horizontal positional accuracy explanation:

Meets or Exceeds National Standard for Spatial Data Accuracy

Vertical positional accuracy:

Vertical positional accuracy report:

No vertical accuracy analysis required for the orthophotos.

Lineage:

Source information:

Source citation:

Citation information:

Originators: Mapping Vendor

Title:

Digital Imagery Acquisition

Publication date: 2009

Series information:

Series name: Aerial Acquisition

Issue identification: Project Area - Year

Publication information:

Publication place: Agency Address

Publisher: Agency

Larger work citation:
Citation information:
Originators: Mapping Vendor

Title:
Digital Imagery Acquisition

Publication date: 2009

Series information:
Series name: Aerial Acquisition
Issue identification: Project Area - Year

Publication information:
Publication place: Agency Address
Publisher: Agency

Source scale denominator: 2400
Type of source media: disc
Source citation abbreviation:
Aerial Imagery
Source contribution:
FY20XX project area Orthophotos

Source time period of content:
Time period information:
Range of dates/times:
Beginning date: 20090101
Ending date: 20090315

Source currentness reference:
Dates of Acquisition

Process step:
Process description:
Description of how the feature class was created

Process date: 2009

Source used citation abbreviation:
Aerial Imagery

Process contact:
Contact information:
Contact organization primary:
Contact organization: Mapping Vendor

Contact address:
Address type: mailing and physical address
Address:

1258 Orthophoto Lane
City: Anywhere
State or province: FL
Postal code: 12587
Country: USA

Contact voice telephone: 555-123-4569

Spatial Data Organization Information:

Direct spatial reference method: Vector

Point and vector object information:

SDTS terms description:

SDTS point and vector object type: String

Point and vector object count: 633

Spatial Reference Information:

Horizontal coordinate system definition:

Planar:

Map projection:

Map projection name: Transverse Mercator

Transverse Mercator:

Scale factor at central meridian: 0.999941

Longitude of central meridian: -82.000000

Latitude of projection origin: 24.333333

False easting: 656166.666667

False northing: 0.000000

Planar coordinate information:

Planar coordinate encoding method: coordinate pair

Coordinate representation:

Abscissa resolution: 0.000328

Ordinate resolution: 0.000328

Planar distance units: survey feet

Geodetic model:

Horizontal datum name: D_North_American_1983_HARN

Ellipsoid name: Geodetic Reference System 80

Semi-major axis: 6378137.000000

Denominator of flattening ratio: 298.257222

Vertical coordinate system definition:

Altitude system definition:

Altitude datum name: North American Vertical Datum of 1988

Altitude resolution: 0.1

Altitude distance units: feet

Altitude encoding method: Explicit elevation coordinate included with horizontal coordinates

Entity and Attribute Information:

Detailed description:

Entity type:

Entity type label: FLIGHTDATE

Entity type definition:

Date the area was flown

Entity type definition source:

Agency

Attribute:

Attribute label: OBJECTID

Attribute definition:

Internal feature number.

Attribute definition source:

ESRI

Attribute domain values:

Unrepresentable domain:

Sequential unique whole numbers that are automatically generated.

Attribute:

Attribute label: Shape

Attribute definition:

Feature geometry.

Attribute definition source:

ESRI

Attribute domain values:

Unrepresentable domain:

Coordinates defining the features.

Attribute:

Attribute label: Shape_Length

Attribute definition:

Length of feature in internal units.

Attribute definition source:

ESRI

Attribute domain values:

Unrepresentable domain:

Positive real numbers that are automatically generated.

Attribute:

Attribute label: FLIGHTDATE

Attribute definition:

Date the area was flown

Attribute definition source:

Agency

Attribute domain values:

Unrepresentable domain:

Positive real numbers that are automatically generated.

Overview description:

Dataset overview:

Each polygon delineates image capture dates used to seam together flight lines for the production of Orthophotos. This feature class conforms to the project boundary and contains non-overlapping polygons with no data voids.

Entity and attribute overview:

Entity and Attribute information designed in accordance to the Orthophoto Specifications

Entity and attribute detail citation:

Entity and Attribute information designed in accordance to the Orthophoto Specifications

Distribution Information:

Distributor:

Contact information:

Contact organization primary:

Contact organization: Agency

Contact address:

Address type: mailing and physical address

Address:

Agency Address

City: City

State or province: State

Postal code: Zip

Country: USA

Contact voice telephone: (555) 555-5555

Hours of service: 8:00 am - 5:00 pm

Resource description: Agency Provided

Distribution liability:

Agency Provided

Standard order process:

Digital form:

Digital transfer information:

Format name: Shapefile

Transfer size: 5

Digital transfer option:

Offline option:
Offline media: CD-ROM
Recording format: Digital

Fees: \$0
Ordering instructions:
Contact Agency
Turnaround: Approximately 1 week

Custom order process:
Agency Provided
Technical prerequisites:
Agency Provided

Metadata Reference Information:

Metadata date: 2009

Metadata contact:
Contact information:
Contact organization primary:
Contact organization: Agency

Contact address:
Address type: mailing and physical address
Address:
2379 Broad Street (U.S. 41 South)
City: City
State or province: State
Postal code: Zip
Country: USA

Contact voice telephone: (555) 555-5555
Contact facsimile telephone: (555) 555-5555

Hours of service: 8:00 a.m. to 5:00 p.m.

ORTHOPHOTO DEM METADATA TEMPLATE

Identification Information:

Citation:

Citation information:

Originators: Agency

Title:

DEM PROJECT AREA

Publication date: 2008

***Geospatial data presentation form:** raster digital data

Series information:

Series name: DEM

Issue identification: Project Area and Year

Publication information:

Publication place: Agency Address

Publisher: Agency

Larger work citation:

Citation information:

Originators: Agency

Title:

DEM

Publication date: 20040101

Series information:

Series name: DEM

Issue identification: Project Area and Year

Publication information:

Publication place: Agency Address

Publisher: Agency

Description:

Abstract:

SAMPLE ABSTRACT:

This Digital Elevation Model (DEM) was derived from the (YEAR) LiDAR data collected by the Agency. The data were assembled into a DEM, tiled and numbered into 5000' x 5000' tiles according to the Florida Statewide (2007) tiling scheme. The DEM was created using mass points and break lines.

Purpose:

This Digital Elevation Model (DEM) was constructed for the explicit purpose of creating Orthophotos. The data are designed to meet or exceed the National Spatial Standards for Digital Data (NSSDA) as specified in the survey reports that accompany the DEM.

Supplemental information:

This DEM tile may represent an entire (5000' x 5000') tile or it may contain a portion thereof. Polygon indexes do not differentiate partial tiles.

Time period of content:

Time period information:

Single date/time:

Calendar date: 2004

Currentness reference:

Publication date

Status:

Progress: Complete

Maintenance and update frequency: Irregular

Spatial domain:

Bounding coordinates:

***West bounding coordinate:** REQUIRED: Western-most coordinate of the limit of coverage expressed in longitude.

***East bounding coordinate:** REQUIRED: Eastern-most coordinate of the limit of coverage expressed in longitude.

***North bounding coordinate:** REQUIRED: Northern-most coordinate of the limit of coverage expressed in latitude.

***South bounding coordinate:** REQUIRED: Southern-most coordinate of the limit of coverage expressed in latitude.

Keywords:

Theme:

Theme keywords: DEM, DTM, LiDAR, Breakline

Theme keyword thesaurus: None

Place:

Place keywords: Florida

Place keyword thesaurus: None

Access constraints: None

Use constraints:

The original data used in the construction of this DEM were collected under the supervision of a licensed Professional Surveyor and Mapper. However, the derived DEM product is not certified to that same extent. Use of these data requires a general understanding of GIS and measurements of spatial accuracy.

Point of contact:

Contact information:

Contact organization primary:

Contact organization: Agency

Contact address:

Address type: mailing and physical address

Address:

Agency Address

City: City

State or province: State

Postal code: Zip

Contact voice telephone: (555) 555-5555

Contact facsimile telephone: (555) 555-5555

Hours of service: 8:00 a.m. to 5:00 p.m.

Data set credit:

Agency and (the name of the vendor)

Cross reference:

Citation information:

Originators: Agency

Title:

DEM

Publication date: 2008

Series information:

Series name: DEM

Issue identification: Project Area and Year

Publication information:

Publication place: Agency Address

Publisher: Agency

Larger work citation:

Citation information:

Originators: Agency

Title:

DEM

Publication date: 20040101

Series information:

Series name: DEM

Issue identification: Project Area and Year

Publication information:

Publication place: Agency Address

Publisher: Agency

Data Quality Information:

Attribute accuracy:

Attribute accuracy report:

See Horizontal and Vertical Accuracy reports. There are no Attributes in this data set.

Logical consistency report:

Not Applicable

Completeness report:

This DEM is complete as represented in the particular tile.

Positional accuracy:

Horizontal positional accuracy:

Horizontal positional accuracy report:

Meets or exceeds National Spatial Data Standards, 1.966(fill in)

Vertical positional accuracy:

Vertical positional accuracy report:

Meets or exceeds National Spatial Data Standards, 1.966(fill in)

Lineage:

Source information:

Source citation:

Citation information:

Originators: Agency

Title:

DEM

Publication date: 2004

Series information:

Series name: DEM

Issue identification: Project Area and Year

Publication information:

Publication place: Agency Address

Publisher: Agency

Larger work citation:

Citation information:

Originators: Agency

Title:

DEM

Publication date: 20040101

Series information:

Series name: DEM

Issue identification: Project Area and Year

Publication information:

Publication place: Agency Address

Publisher: Agency

Source scale denominator: 2400

Type of source media: disc

Source citation abbreviation:

DEM

Source contribution:

Elevations in NAVD88 feet

Source time period of content:

Time period information:

Single date/time:

Calendar date: 2004

Source currentness reference:

Year of LiDAR collection

Process step:

Process description:

The vendor will describe how the Break lines and Mass points were interpolated into the DEM.

Process date: 2004

Process contact:

Contact information:

Contact organization primary:

Contact person: Mapping Vendor

Contact organization: Mapping Vendor

Contact address:

Address type: mailing and physical address

Address:

141 Orthophoto Lane

City: Orthoville

State or province: FL

Postal code: 12369

Contact voice telephone: 555) 555-5555

Contact facsimile telephone: (555) 555-5555

Hours of service: 8:00 a.m. to 5:00 p.m.

Spatial Data Organization Information:

Indirect spatial reference method:
Florida State Plane West/FIPS 0902

***Direct spatial reference method:** Raster

Raster object information:
Row count: 500
Column count: 500

***Raster object type:** Grid Cell

Spatial Reference Information:

Horizontal coordinate system definition:
Planar:
Map projection:
Map projection name: Transverse Mercator
Transverse Mercator:
Scale factor at central meridian: 0.99994118
Longitude of central meridian: -82.000000
Latitude of projection origin: 24.333333333
False easting: 656166.66666667
False northing: 0.0000000000

Planar coordinate information:
***Planar coordinate encoding method:** row and column
Coordinate representation:
Abscissa resolution: 10.000000
Ordinate resolution: 10.000000
Planar distance units: survey feet

Geodetic model:
Horizontal datum name: North American Datum of 1983
Ellipsoid name: Geodetic Reference System 80
Semi-major axis: 1.0
Denominator of flattening ratio: 1.0

Vertical coordinate system definition:
Altitude system definition:
Altitude datum name: North American Vertical Datum of 1988
Altitude resolution: 0.1
Altitude distance units: feet
Altitude encoding method: Explicit elevation coordinate included with horizontal coordinates

Entity and Attribute Information:

Detailed description:

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Entity type:
Entity type label: Value
Entity type definition:
Elevation in NAVD88 feet
Entity type definition source:
Agency

Attribute:
Attribute label: Value
Attribute definition:
Elevation in NAVD88 feet
Attribute definition source:
North American Vertical Datum of 1988

Attribute domain values:
Range domain:
Range domain minimum: -1000
Range domain maximum: 1000
Attribute units of measure: feet
Attribute measurement resolution: 0.01

Beginning date of attribute values: 2004
Ending date of attribute values: 2004

Attribute value accuracy information:
Attribute value accuracy: 0.1 feet
Attribute value accuracy explanation:
Tested to NSSDA 95% CI

Attribute measurement frequency:
Irregular

Overview description:
Entity and attribute overview:
The elevation data are reported in NAVD88 feet

Entity and attribute detail citation:
None

Distribution Information:

Distributor:
Contact information:
Contact organization primary:
Contact organization: Agency

Contact address:
Address type: mailing and physical address
Address:
Agency Address

City: City
State or province: State
Postal code: Zip

Contact voice telephone: (555) 555-5555
Contact facsimile telephone: (555) 555-5555

Hours of service: 8:00 a.m. to 5:00 p.m.

Resource description: Agency Provided

Distribution liability:
Agency Provided

Standard order process:
Digital form:
Digital transfer information:
Format name: ESRI GRID
Format version number: ArcGIS 9.2
Format specification:
ESRI GRID
Format information content:
ESRI GRID
File decompression technique: no compression applied
***Transfer size:** 3.934

Digital transfer option:
Online option:
Computer contact information:
Network address:

Access instructions:
Arrange for FTP download
Online computer and operating system:
FTP

Offline option:
Offline media: CD-ROM/DVD-ROM, HDD
Recording format: ASCII

Fees: 0.00
Ordering instructions:
Agency Provided
Turnaround: 48 - 72 hrs

Custom order process:
Agency Provided
Technical prerequisites:
Agency Provided

Available time period:
Time period information:
Single date/time:
Calendar date: 20040101
Time of day: 0800

Metadata Reference Information:

***Metadata date:** 20090609

Metadata contact:
Contact information:
Contact organization primary:
Contact organization: Agency

Contact address:
Address type: mailing and physical address
Address:
Agency Address
City: City
State or province: State
Postal code: Zip

Contact voice telephone: (555) 555-5555
Contact facsimile telephone: (555) 555-5555

Hours of service: 8:00 a.m. to 5:00 p.m.