

Hillshade Digital Elevation Model 2012, Manassas National Battlefield Park, Virginia (Hillshade)

Type Raster Dataset

Tags Breaklines, Virginia, Hydro Flattened, Lidar, Elevation, DEM, United States of America, LAS, DTM, Loudoun, Fairfax, Manassas National Battlefield Park, MANA, National Capital Region, NCR, National Park Service, NPS

Summary

The purpose of this LiDAR data was to produce high accuracy 3D elevation products, including tiled LiDAR in LAS 1.2 format, 3D breaklines, and a 1 m cell size hydro flattened Digital Elevation Models (DEM).

Description

This hillshade digital elevation model (DEM) raster covers the area around Manassas National Battlefield Park in Manassas, Virginia collected in 2012. This raster is the merging of two individual raster files: lidar01m38077g4.tif and lidar01m38077g5.tif. The resulting raster was then cropped to a more limited area around the park. The hillshade raster was generated using the ArcToolbox tool 3D Analyst Tools > Raster Surface > Hillshade with an azimuth of 315, an altitude of 45, and a z-factor of 1.

While the park is mostly within Loudoun County, the far eastern part is in Fairfax County. The Loudoun County LiDAR data was collected in May 2012 and the Fairfax County LiDAR data was collected in November 2012.

Dewberry collected LiDAR for ~3,942 square miles in various Virginia, West Virgina, and Maryland Counties. The acquisition was performed by Geodigital. This metadata covers the LiDAR produced for the Loudoun County project area. The nominal pulse spacing for this project is 1.6 ft (0.5 meters). This project was collected with a sensor which collects intensity values for each discrete pulse extracted from the waveform. GPS Week Time, Intensity, Flightline and echo number attributes were provided for each LiDAR point. Dewberry used proprietary procedures to classify the LAS according to contract specifications: 1-Unclassified, 2-Ground, 7-Noise, 9-Water, 10-Ignored Ground due to breakline proximity, and 11-Withheld. Dewberry produced 3D breaklines and combined these with the final LiDAR data to produce seamless hydro flattened DEMs for the 694 tiles (1500 m x 1500 m) that cover the this deliverable.

Credits

U.S. Geological Survey and the Federal Emergency Management Administration

Use limitations

This data was produced for the USGS and FEMA according to specific project requirements. This information is provided "as is". Further documentation of this data can be obtained by contacting: Patrick Emmett, MS 666, 1400 Independence Road, Rolla, MO 65401. Telephone (573) 308-3587.

Extent

West	-77.612835	East	-77.456176
North	38.868827	South	38.761814

Scale Range

Maximum (zoomed in)	1:5,000
Minimum (zoomed out)	1:150,000,000

Topics and Keywords ►

Themes or categories of the resource Elevation

Content type ⇌ Downloadable Data

Theme keywords Breaklines, Hydro Flattened, Lidar, Elevation, DEM, LAS, DTM

Place keywords Virginia, United States of America, Loudoun

Citation ►

Title	Hillshade Digital Elevation Model 2012, Manassas National Battlefield Park, Virginia (Hillshade)
Publication date	2012-05-01
Indeterminate time	unknown

Presentation formats	hardcopy map
FGDC geospatial presentation format	map

Citation Contacts ►

Responsible party - originator	
Organization's name	Loudoun County - FEMA Region 3 FY12 LiDAR

Resource Details ►

Dataset languages English (UNITED STATES)

Status	completed
Spatial representation type	vector

Supplemental information
A complete description of this dataset is available in the Final Project Report.

Processing environment Esri ArcGIS 12.9.3.32739

Credits
U.S. Geological Survey and the Federal Emergency Management Administration

ArcGIS item properties

Name ⇔ MANA_DSM_Hill2012.tif

Extents ►

Extent

Geographic extent

Bounding rectangle

West longitude -77.960565
East longitude -77.320837
South latitude 38.829305
North latitude 39.343815

Extent

Description

ground condition

Temporal extent

Beginning date 2011-12-15
Ending date 2012-05-15

Extent

Geographic extent

Bounding rectangle

Extent type

Extent used for searching

West longitude ⇔ -77.612835
East longitude ⇔ -77.456176
North latitude ⇔ 38.868827
South latitude ⇔ 38.761814
Extent contains the resource ⇔ Yes

Extent in the item's coordinate system

westBL ⇔ 273305.474319
eastBL ⇔ 286599.782250
southBL ⇔ 4293578.128678
northBL ⇔ 4305095.857493
exTypeCode ⇔ Yes

Resource Points of Contact ►

Point of contact - point of contact

Individual's name Patrick Emmett
Organization's name USGS

Contact information ►

Phone

Voice 573.308.3587

Address

Type both
Delivery point MS 666, 1400 Independence Road
City Rolla
Administrative area Missouri
Postal code 65401
e-mail address pemmett@usgs.gov
Hours of service
8:00 AM - 5:00 PM

Resource Maintenance ►

Resource maintenance

Update frequency as needed

Resource Constraints ►

Legal constraints

Limitations of use

This data was produced for the USGS according to specific project requirements. This information is provided "as is". Further documentation of this data can be obtained by contacting: USGS/NGTOC, 1400 Independence Road, Rolla, MO 65401. Telephone (573) 308-3587.

Constraints

Limitations of use

This data was produced for the USGS and FEMA according to specific project requirements. This information is provided "as is". Further documentation of this data can be obtained by contacting: Patrick Emmett, MS 666, 1400 Independence Road, Rolla, MO 65401. Telephone (573) 308-3587.

Spatial Reference ►

ArcGIS coordinate system

Type ⇔ Projected

Geographic coordinate reference ⇔ GCS_North_American_1983

Projection ⇔ NAD_1983_UTM_Zone_18N

Coordinate reference details ⇔

ProjectedCoordinateSystem

WKID 26918
XOrigin -5120900
YOrigin -9998100
XYScale 450445547.3910538
ZOrigin -100000
ZScale 10000
MOrigin -100000
MScale 10000
XYTolerance 0.001
ZTolerance 0.001
MTolerance 0.001
HighPrecision true
LatestWKID 26918
WKT
PROJCS["NAD_1983_UTM_Zone_18N",GEOGCS["GCS_North_American_1983",DATUM["D_North_American_1983",SPHEROID["GRS_1980",6378137.0,298.257222101]],PRIMEM["Gree

Reference system identifier

Value ⇔ 26918
Codespace ⇔ EPSG
Version ⇔ 6.11(3.0.1)

Spatial Data Properties ▶

Georectified Grid ▶

Number of dimensions ⇔ 2

Axis dimensions properties - column (x-axis)

Dimension size ⇔ 19254
Resolution ⇔
0.690470 m (meter)

Axis dimensions properties - row (y-axis)

Dimension size ⇔ 16681
Resolution ⇔
0.690470 m (meter)

Cell geometry ⇔ area
Point in pixel ⇔ center

Transformation parameters are available ⇔ Yes

Check points are available ⇔ No

Corner points

Point ⇔ 273305.474319 4293578.128678

Point ⇔ 273305.474319 4305095.857493

Point ⇔ 286599.782250 4305095.857493

Point ⇔ 286599.782250 4293578.128678

Center point ⇔ 279952.628285 4299336.993086

ArcGIS Raster Properties ▶

General Information

Pixel depth ⇔ 8
Compression type ⇔ LZW
Number of bands ⇔ 1
Raster format ⇔ TIFF
Source type ⇔ discrete
Pixel type ⇔ unsigned integer
No data value ⇔ 255
Has colormap ⇔ No
Has pyramids ⇔ Yes

Spatial Data Content ▶

Image Description

Type of information ⇔ thematic classification

Band information

Description ⇔ Band_1
Maximum value ⇔ 254.000000
Minimum value ⇔ 1.000000
Number of bits per value ⇔ 8

Data Quality ▶

Scope of quality information ▶

Resource level dataset

Data quality report - Conceptual consistency ▶

Data quality measure reference

Measure description

Data covers the tile scheme provided for the project area.

Data quality report - Completeness omission ▶

Data quality measure reference

Measure description

A visual qualitative assessment was performed to ensure data completeness and bare earth data cleanliness. No void or missing data, the bare earth surface is of good quality and data passes vertical accuracy specifications.

Data quality report - Absolute external positional accuracy ▶

dimension horizontal

Data quality measure reference

Measure description

Lidar source compiled to meet 1 meter horizontal accuracy at the 95 percent confidence level.

Quality evaluation procedure

Evaluation method

Dewberry does not perform independent horizontal accuracy testing on the LiDAR. LiDAR vendors perform calibrations on the LiDAR sensor and compare data to adjoining flight lines to ensure LiDAR meets the 1 meter horizontal accuracy standard at the 95% confidence level. Please see the final project report for more details.

Quantitative test results

Value 3.28 ft

Data quality report - Absolute external positional accuracy ▶

dimension vertical

Data quality measure reference

Measure description

The vertical accuracy of the LiDAR was tested by Dewberry with 27 independently collected checkpoints. The survey checkpoints are distributed throughout the project area. These 27 checkpoints contain 6 open terrain points, 6 crops/weeds points, 5 forested points, 5 urban points, and 5 points located around brush lands and trees. The 27 checkpoints were used to compute the Fundamental Vertical Accuracy (FVA) and the Consolidated Vertical Accuracy (CVA). Project specifications required a FVA of 0.245 meters for open terrain and a CVA of 0.363 meters. Appendix A, Guidance for Aerial Mapping and Surveying, to FEMA's "Guidelines and Specifications for Flood Hazard Mapping Partners" requires a minimum of 60 test points -- 20 each in a minimum of three land cover categories representative of the floodplain. FEMA's Procedure Memorandum No. 61 -- "Standards for Lidar and Other High Quality Digital Topography" -- specifies that the positional accuracy of LiDAR shall be in accordance with ASPRS/NDEP standards for accuracy testing as well as the USGS "Lidar Guidelines and Base Specifications, v13." All of these standards and guidelines require testing for Fundamental Vertical Accuracy (FVA), Supplemental Vertical Accuracy (SVA), and Consolidated Vertical Accuracy (CVA), using a minimum of 20 checkpoints each in a minimum of three land cover categories for a minimum total of 60 QA/QC checkpoints.

Quality evaluation procedure

Evaluation method

The breaklines are derived from the source LiDAR. Vertical accuracy is not tested on the breaklines. This RMSE analysis was performed on the Classified LiDAR Data. Based on the vertical accuracy testing conducted by Dewberry, using NSSDA and FEMA methodology, vertical accuracy at the 95% confidence level (called Accuracyz) is computed by the formula $RMSEz \times 1.9600$. The dataset for the Loudoun County project area satisfies the criteria: Lidar dataset tested 0.18 meters vertical accuracy at 95% confidence level, based on $RMSEz (0.09 \text{ ft}) \times 1.9600$. The Consolidated Vertical Accuracy is 0.24 meters.

Quantitative test results

Value 0.12 meters

Lineage ▶

Process step ▶

When the process occurred 2012-05-01

Description

Project Level Metadata

Process contact - processor

Individual's name Keith Patterson

Organization's name Dewberry - Geospatial Services Group

Contact's position Project Manager

Contact information ▶

Phone

Voice 813.421.8635

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Address

Type both

Delivery point 1000 N. Ashley Drive, Suite 801

City Tampa

Administrative area FL

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Country US

e-mail address kpatterson@dewberry.com

Hours of service

8:00 - 5:00 EST

Source data ►
Relationship to the process step used

Source citation ►
Alternate titles None

Source data ►
Relationship to the process step produced

Source citation ►
Alternate titles Metadata

Source data ►
Description
LiDAR data representing FEMA Region 3FT Task Order to be used for various analyses and research purposes.

Source citation ►
Title Loundoun County - FEMA Region 3 FY 12 LiDAR
Alternate titles none
Publication date 2012-05-15

Edition One

Presentation formats hardcopy map
FGDC geospatial presentation format map

Responsible party - publisher
Organization's name Dewberry

Contact information ►
Address
Delivery point Fairfax, VA

Responsible party - originator
Organization's name Dewberry

Resource location online
Online location (URL) withheld

Extent of the source data
Description
Ground Condition

Temporal extent
Beginning date 2011-12-01
Ending date 2012-05-01

Distribution ►

Distributor ►
Contact information - distributor
Individual's name Patrick Emmett
Organization's name USGS

Contact information ►
Phone
Voice 573.308.3587
Address
Type both
Delivery point MS 666, 1400 Independence Road
City Rolla
Administrative area Missouri
Postal code 65401
Country US
e-mail address pemmett@usgs.gov
Hours of service
8:00 AM - 5:00 PM

Distribution format
Name ⇔ Raster Dataset

Fields ►

Details for object MANA_DSM_Hill2012.tif.vat ►
Type ⇔ Table
Row count ⇔ 254

Field OID ►
Alias ⇔ OID

Data type ⇔ OID

Width ⇔ 4

Precision ⇔ 0

Scale ⇔ 0

Field description ⇔

Internal feature number.

Description source ⇔

Esri

Description of values ⇔

Sequential unique whole numbers that are automatically generated.

Field Value ►

Alias ⇔ Value

Data type ⇔ Integer

Width ⇔ 10

Precision ⇔ 10

Scale ⇔ 0

Field Count ►

Alias ⇔ Count

Data type ⇔ Double

Width ⇔ 19

Precision ⇔ 0

Scale ⇔ 0

Metadata Details ►

Metadata language English (UNITED STATES)

Metadata character set utf8 - 8 bit UCS Transfer Format

Scope of the data described by the metadata dataset

Scope name ⇔ dataset

Last update ⇔ 2022-08-23

ArcGIS metadata properties

Metadata format ArcGIS 1.0

Metadata style FGDC CSDGM Metadata

Standard or profile used to edit metadata FGDC

Created in ArcGIS for the item 2016-05-09 13:24:12

Last modified in ArcGIS for the item 2022-08-23 13:52:25

Automatic updates

Have been performed Yes

Last update 2022-08-23 13:52:25

Metadata Contacts ►

Metadata contact - point of contact

Individual's name Patrick Emmett

Organization's name USGS

Contact information ►

Phone

Voice 573.308.3587

Address

Type both

Delivery point MS 666, 1400 Independence Road

City Rolla

Administrative area Missouri

Postal code 65401

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e-mail address pemmett@usgs.gov

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