Middle_Rio_Grande_East

Summary USGS National Geospatial Program Lidar Base Specification Version 1.2 Report

Quality level tested: QL2

Report generated on 4/26/2018

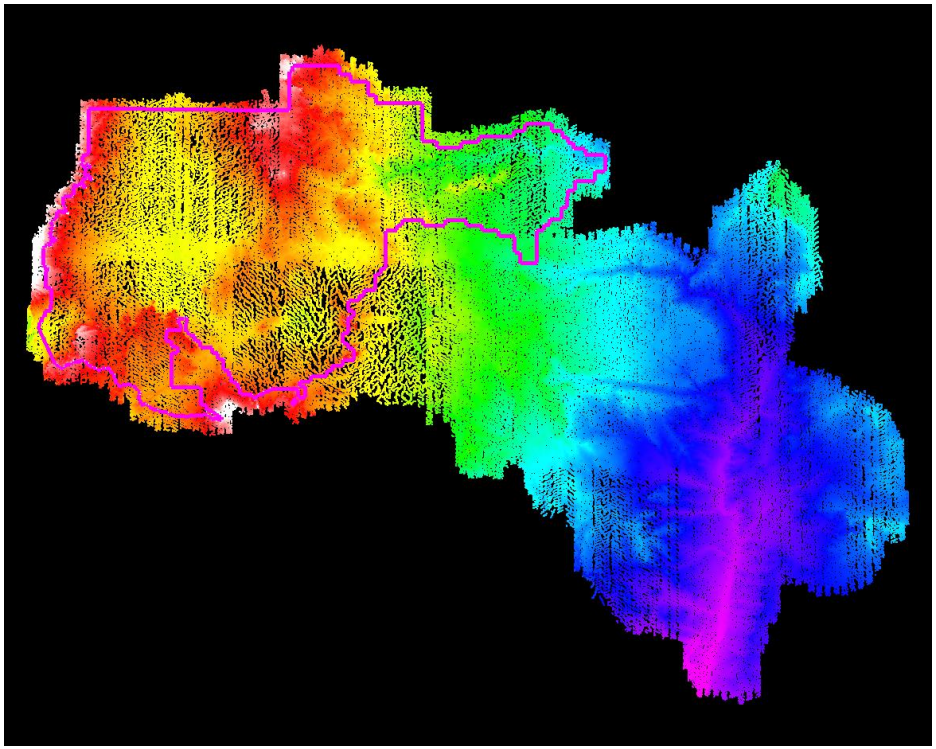
This document reports on compliance with the USGS National Geospatial Program Lidar Base Specification Version 1.2. The complete specification, which also contains a list of abbreviations, acronyms, and a glossary of related terms, can be found here.

C-1 Report on Collection Area (Swath Data)

The USGS Lidar Base Specification Version 1.2 states: "The defined project area (DPA) shall be buffered by a minimum of 100 meters (m) to create a buffered project area (BPA). Data collection is required for the full extent of the BPA. In order for all products to be consistent to the edge of the DPA, all products shall be generated to the full extent of the BPA. Because data and products are generated for the complete BPA, they shall also be delivered to the customer."

The purpose of this section is to show swath lidar coverage to the extent of a 100 meter buffer of the defined project area boundary.

Data Source - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\LiDAR\01_Boresight\Rio_Grande\LAS
Result Path - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Admin\QA_QC\04_17_2018_Middle_Rio_Grande_East\C_1\CollectionArea_Swath.jpg



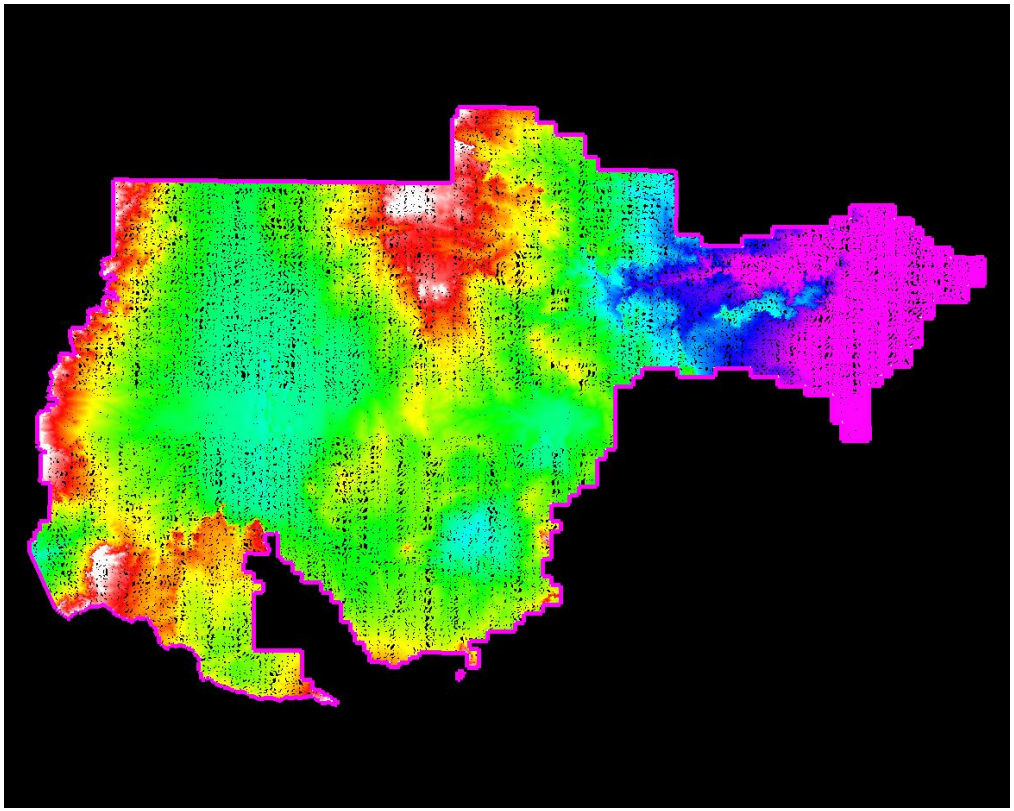
White polygon is defined project area (DPA) boundary
Purple polygon is buffered project area (BPA) boundary

C-1 Report on Collection Area (Tiled Data)

The purpose of this section is to show tiled lidar coverage to the extent of a 100 meter buffer of the defined project area boundary.

Data Source - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\Final_Client_Deliverables\Block2_MiddleRioGrandeEast\point_cloud\tilecls

Result Path - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Admin\QA_QC\04_17_2018_Middle_Rio_Grande_East\C_1\CollectionArea_Tiles.jpg



White polygon is defined project area (DPA) boundary
Purple polygon is buffered project area (BPA) boundary

C-2 Report on Multiple Discrete Returns (Swath Data)

The USGS Lidar Base Specification Version 1.2 states: "Deriving and delivering multiple discrete returns is required in all data collection efforts. Data collection shall be capable of at least three returns per pulse. Full waveform collection is acceptable and will be promoted; however, full waveform data are regarded as supplemental information."

The purpose of this section is to report on the presence and quantities of lidar returns in the LAS swath data. Empty return columns can indicate a collection or processing problem dealing with lidar return attribute information.

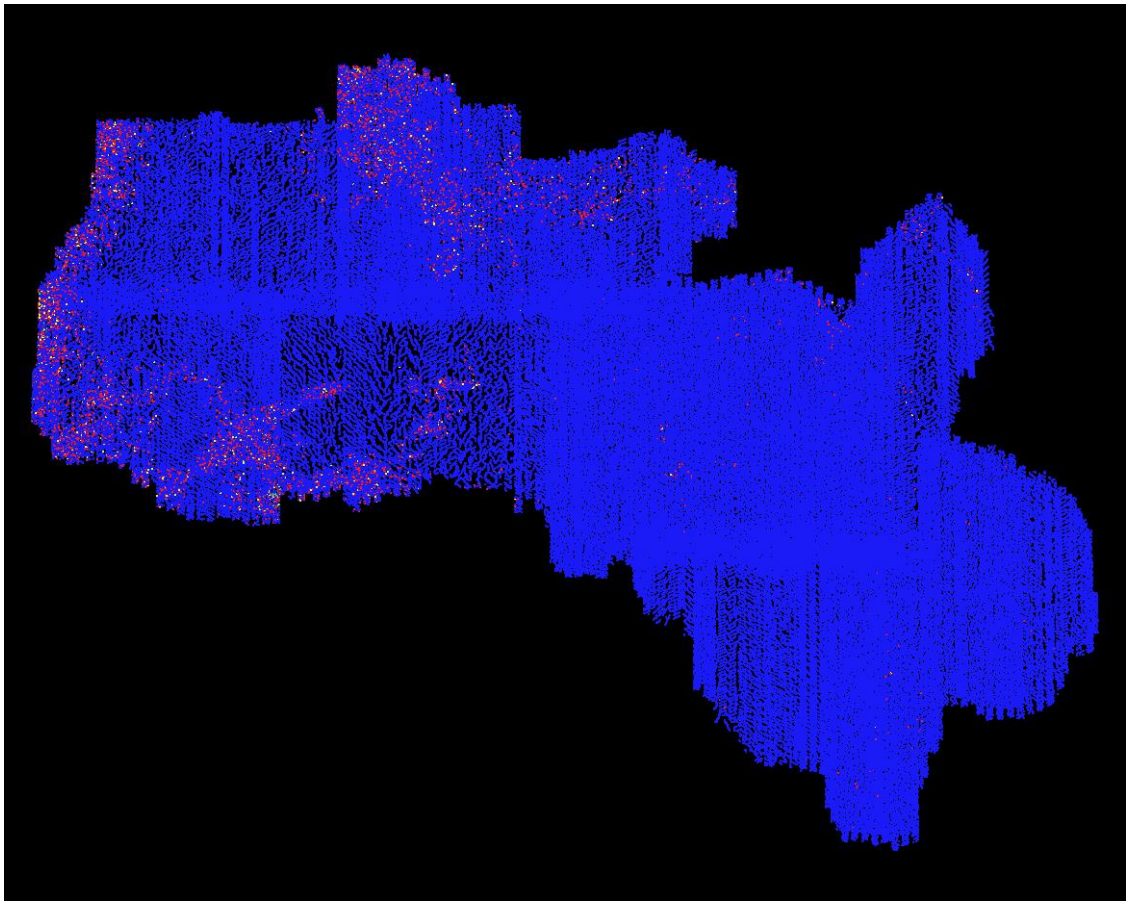
Boresighted Files - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\LiDAR\01_Boresight\Rio_Grande\LAS

File	First return	Second return	Third return	Other returns	Total points
Total	78,318,454,880	2,298,237,375	304,279,670	16,439,760	80,937,411,685

C-2 Report on Multiple Discrete Returns (Swath Data) - All Returns

The purpose of this section is to show a graphic of lidar swath data points colored by all returns. Blank flight lines can indicate a collection or processing problem dealing with lidar return attribute information.

Data Source - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\LiDAR\01_Boresight\Rio_Grande\LAS
Result Path - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Admin\QA_QC\04_17_2018_Middle_Rio_Grande_East\C_2\ColorByReturns_Boresighted.jpg



C-2 Report on Multiple Discrete Returns (Tiled Data)

The USGS Lidar Base Specification Version 1.2 states: "Deriving and delivering multiple discrete returns is required in all data collection efforts. Data collection shall be capable of at least three returns per pulse. Full waveform collection is acceptable and will be promoted; however, full waveform data are regarded as supplemental information."

The purpose of this section is to report on the presence and quantities of lidar returns in the LAS tiled data. Empty return columns can indicate a collection or processing problem dealing with lidar return attribute information.

Classified Files - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\Final_Client_Deliverables\Block2_MiddleRioGrandeEast\point_cloud\tilecls

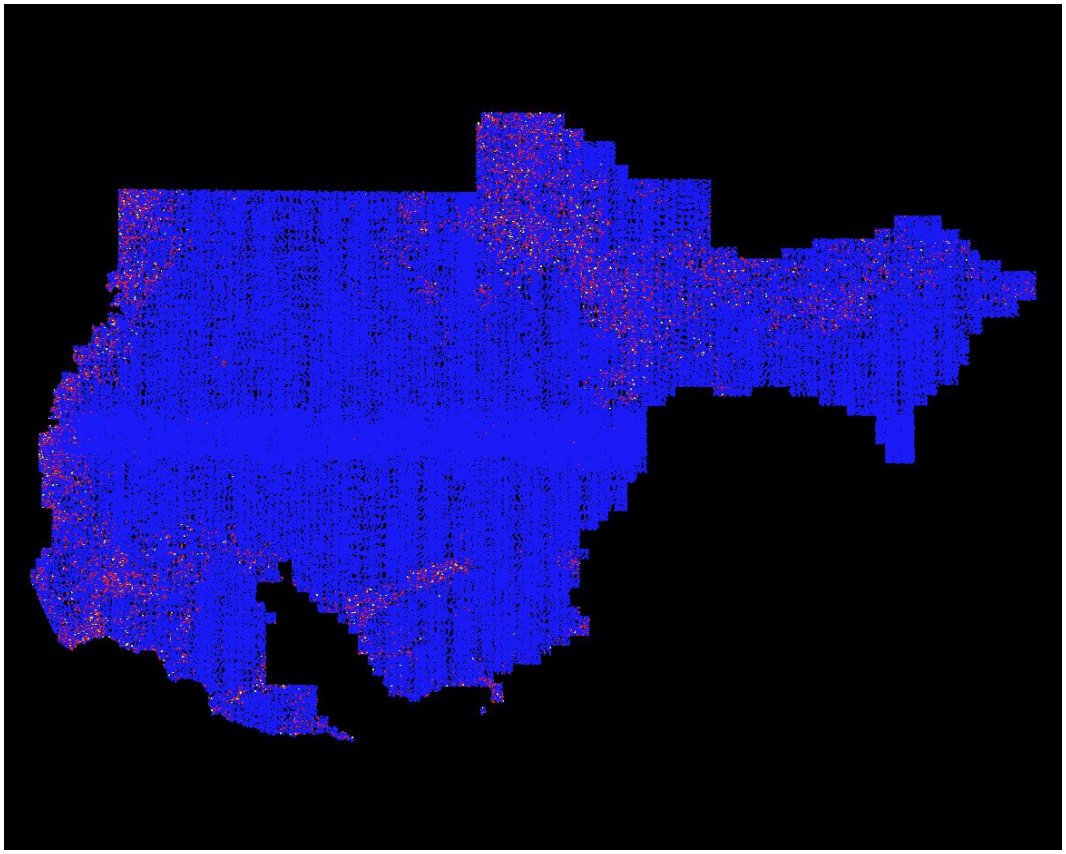
File	First return	Second return	Third return	Other returns	Total points
Total	28,826,771,026	1,244,623,079	150,332,332	4,951,785	30,226,678,222

C-2 Report on Multiple Discrete Returns (Tiled Data) - All Returns

The purpose of this section is to show a graphic of lidar tiled data points colored by all returns. Blank tiles can indicate a collection or processing problem dealing with lidar return attribute information.

Data Source - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\Final_Client_Deliverables\Block2_MiddleRioGrandeEast\point_cloud\tilecls

Result Path - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Admin\QA_QC\04_17_2018_Middle_Rio_Grande_East\C_2\ColorByReturns_Classified.jpg



C-3 Report on Intensity Values (Swath Data)

The USGS Lidar Base Specification Version 1.2 states: "Intensity values are required for each multiple discrete return. The values recorded in the LAS files shall be normalized to 16 bit, as described in the LAS Specification version 1.4 (American Society for Photogrammetry and Remote Sensing, 2011)."

The purpose of this section is to report on the presence and quantities of lidar intensity in the LAS swath data.

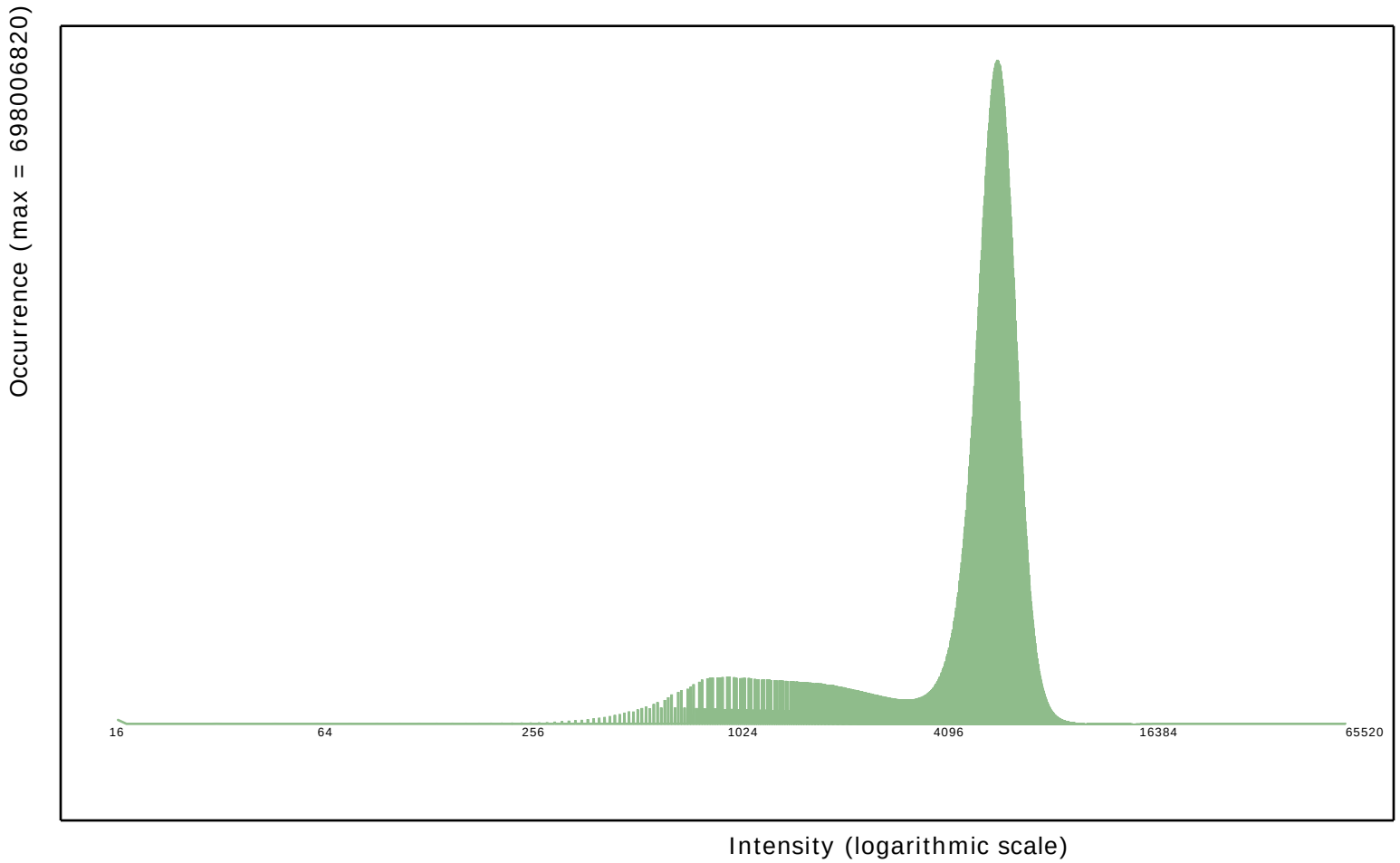
Boresighted Files - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\LiDAR\01_Boresight\Rio_Grande\LAS

File	Minimum	Maximum	Mean	Median	Mode
Overall Statistics	16	65,520	6,004	6,224	6,304

C-3 Report on Intensity Values (Swath Data) - continued

The purpose of this section is to show a frequency distribution chart of intensities throughout all of the lidar swath files. It is important to understand that 8-bit intensity lidar systems have a valid intensity range from 0-255, and 12-bit intensity lidar systems have a valid intensity range from 0-4095.

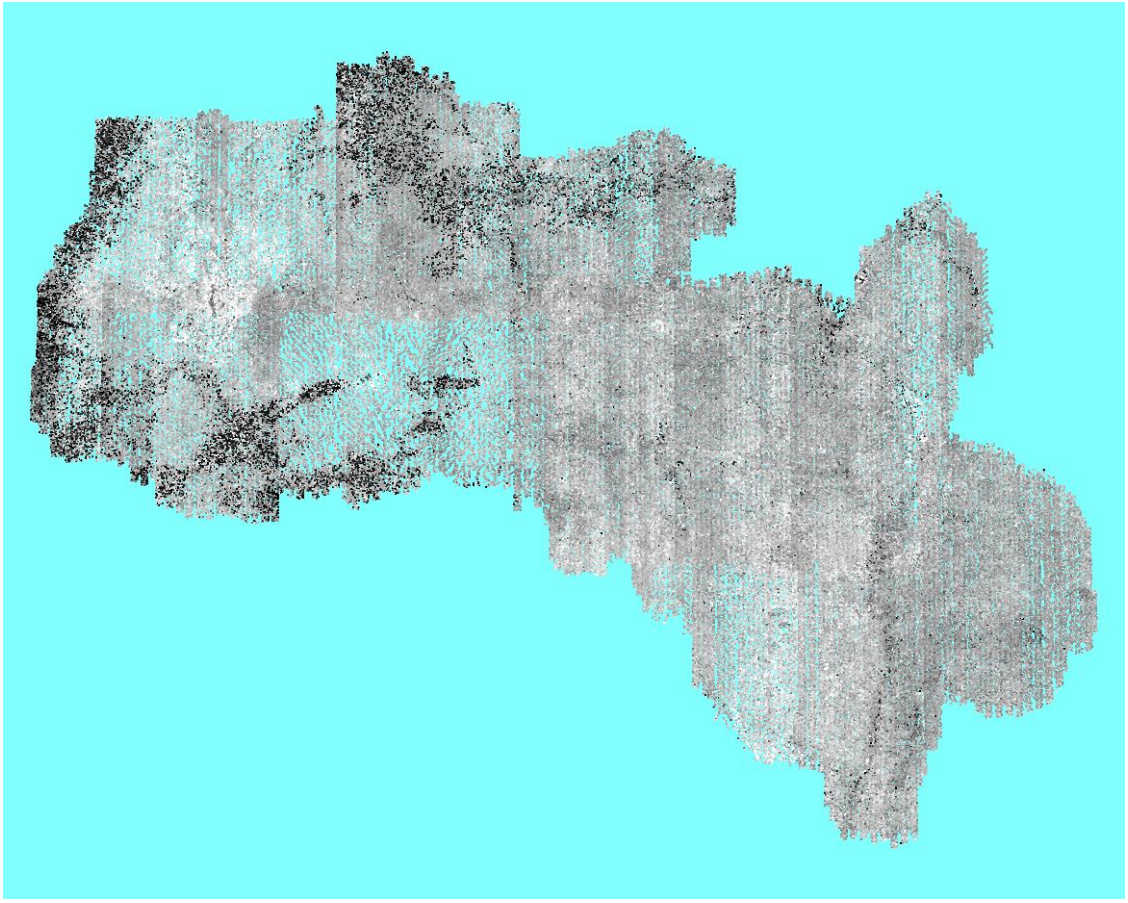
Data Source - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\LiDAR\01_Boresight\Rio_Grande\LAS



C-3 Report on Intensity Values (Swath Data) - continued

The purpose of this section is to show a graphic of lidar swath data points colored by intensity. Blank tiles can indicate a processing problem dealing with lidar intensity attribute information.

Data Source - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\LiDAR\01_Boresight\Rio_Grande\LAS
Result Path - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Admin\QA_QC\04_17_2018_Middle_Rio_Grande_East\C_3\ColorByIntensity_Boresighted.jpg



C-3 Report on Intensity Values (Tiled Data)

The USGS Lidar Base Specification Version 1.2 states: "Intensity values are required for each multiple discrete return. The values recorded in the LAS files shall be normalized to 16 bit, as described in the LAS Specification version 1.4 (American Society for Photogrammetry and Remote Sensing, 2011)."

The purpose of this section is to report on the presence and quantities of lidar intensity in the LAS tiled data.

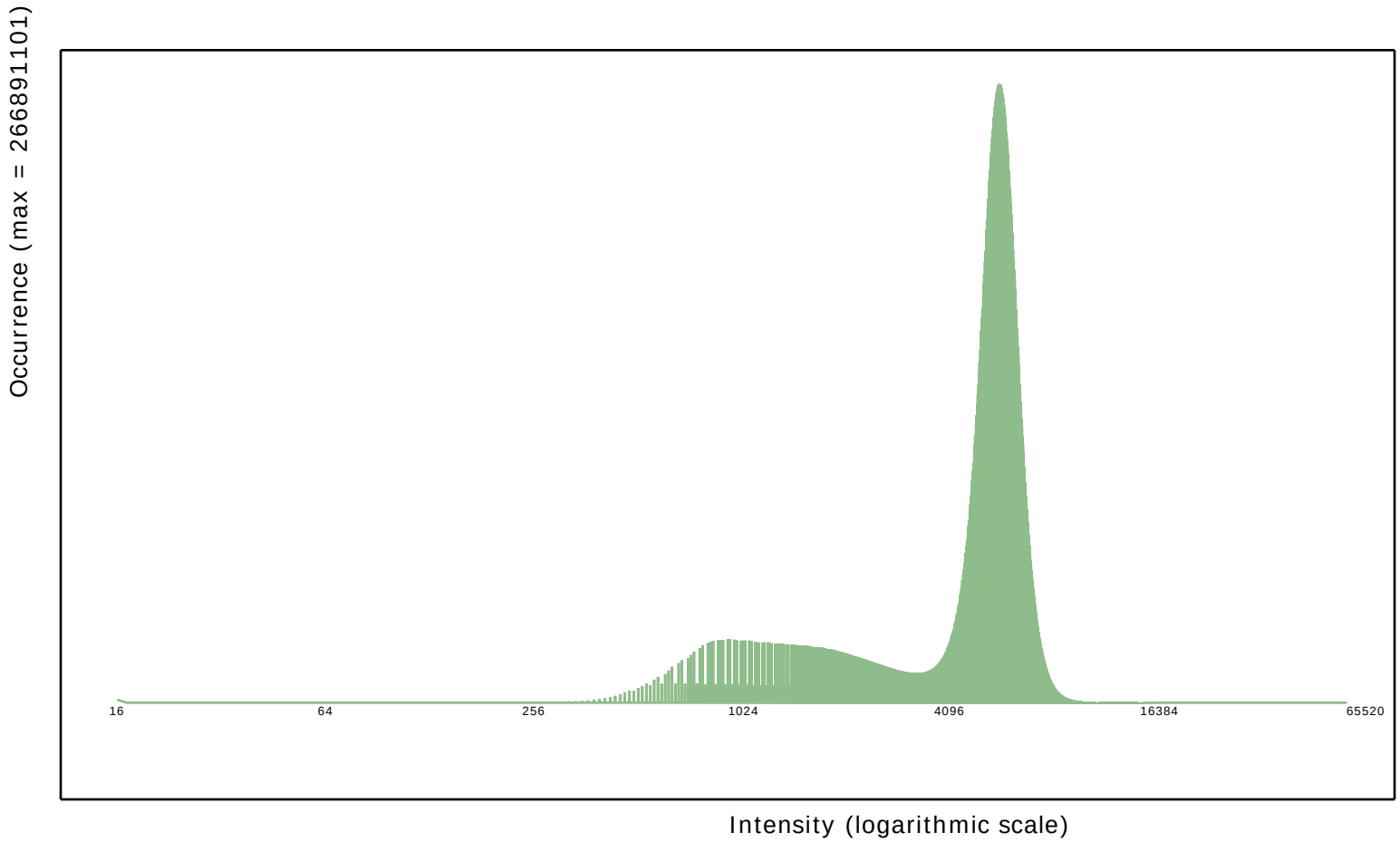
Classified Files - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\Final_Client_Deliverables\Block2_MiddleRioGrandeEast\point_cloud\tilecls

File	Minimum	Maximum	Mean	Median	Mode
Overall Statistics	16	65,520	5,950	6,256	6,352

C-3 Report on Intensity Values (Tiled Data) - continued

The purpose of this section is to show a frequency distribution chart of intensities throughout all of the lidar tiled files. It is important to understand that 8-bit intensity lidar systems have a valid intensity range from 0-255, and 12-bit intensity lidar systems have a valid intensity range from 0-4095.

Data Source - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\Final_Client_Deliverables\Block2_MiddleRioGrandeEast\point_cloud\tilecls

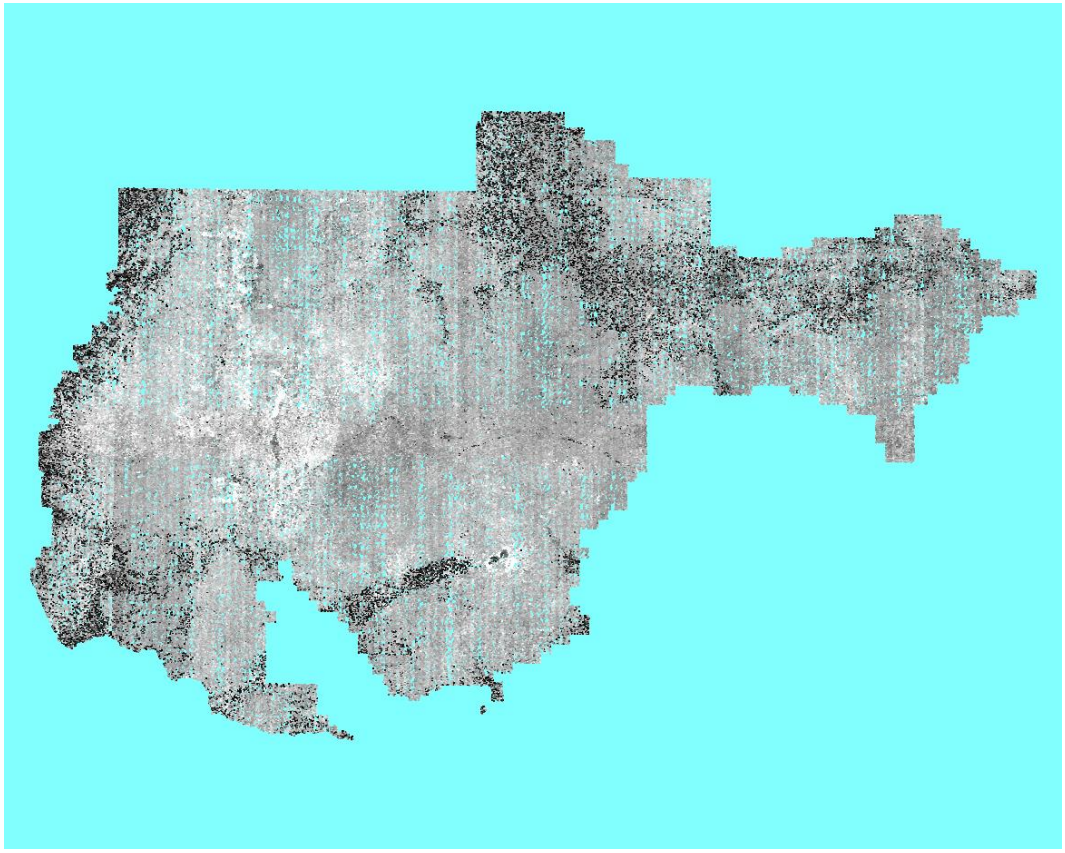


C-3 Report on Intensity Values (Tiled Data) - continued

The purpose of this section is to show a graphic of lidar tiled data points colored by intensity. Blank tiles can indicate a processing problem dealing with lidar intensity attribute information.

Data Source - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\Final_Client_Deliverables\Block2_MiddleRioGrandeEast\point_cloud\tilecls

Result Path - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Admin\QA_QC\04_17_2018_Middle_Rio_Grande_East\C_3\ColorByIntensity_Classified.jpg



C-4 Report on Nominal Pulse Spacing (NPS)

The USGS Lidar Base Specification Version 1.2 states: "Assessment and reporting of the NPS is made against single swath, single instrument, first return only data, including only the geometrically usable part of the swath (typically the center 95 percent) and excluding acceptable data voids. Higher net densities of lidar point measurements are being achieved more often by using multiple coverages, creating a need for a separate new term to prevent confusion with NPS and NPD. This specification will use the terms aggregate nominal pulse spacing (ANPS) and aggregate nominal pulse density (ANPD) to describe the net overall pulse spacing and density, respectively. The table "Aggregate nominal pulse spacing and density, Quality Level 0–Quality Level 3" (table 1) lists the required ANPS and ANPD by QL. Dependent on the local terrain and land cover conditions in a project, a greater pulse density may be required on specific projects."

Table 1. Aggregate nominal pulse spacing and density, Quality Level 0–Quality Level 3.

[m, meters; pls/m^2, pulses per square meter; ≤, less than or equal to; ≥, greater than or equal to]

Quality Level (QL)	Aggregate nominal pulse spacing (ANPS) (m)	Aggregate nominal pulse density (ANPD) (pls/m^2)
QL0	≤0.35	≥8.0
QL1	≤0.35	≥8.0
QL2	≤0.71	≥2.0
QL3	≤1.41	≥0.5

The purpose of this section is to report on the lidar point density and nominal point spacing by swath file. Averages by swath files (not including overlap), project boundary polygons (including swath overlap), and aggregate project boundary polygons (including swath overlap) are reported.

Boresighted Files - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\LiDAR\01_Boresight\Rio_Grande\LAS

Quality level tested: QL2

Units: Meter

File	Number of First Returns	Area of Swath	Point Density	NPS
Average			2.482/0.231 pp Square Meter/ pp Square US Survey Foot	0.635/2.083 Meter/ US Survey Feet

C-4 Report on Nominal Pulse Spacing (NPS) - continued

Boundary ID	Number of First Returns	Area of Swath	Point Density	NPS
Aggregate	28,835,731,225	8,187,794,746	3.522/0.327 pp Square Meter/ pp Square US Survey Foot	0.533/1.749 Meter/ US Survey Feet

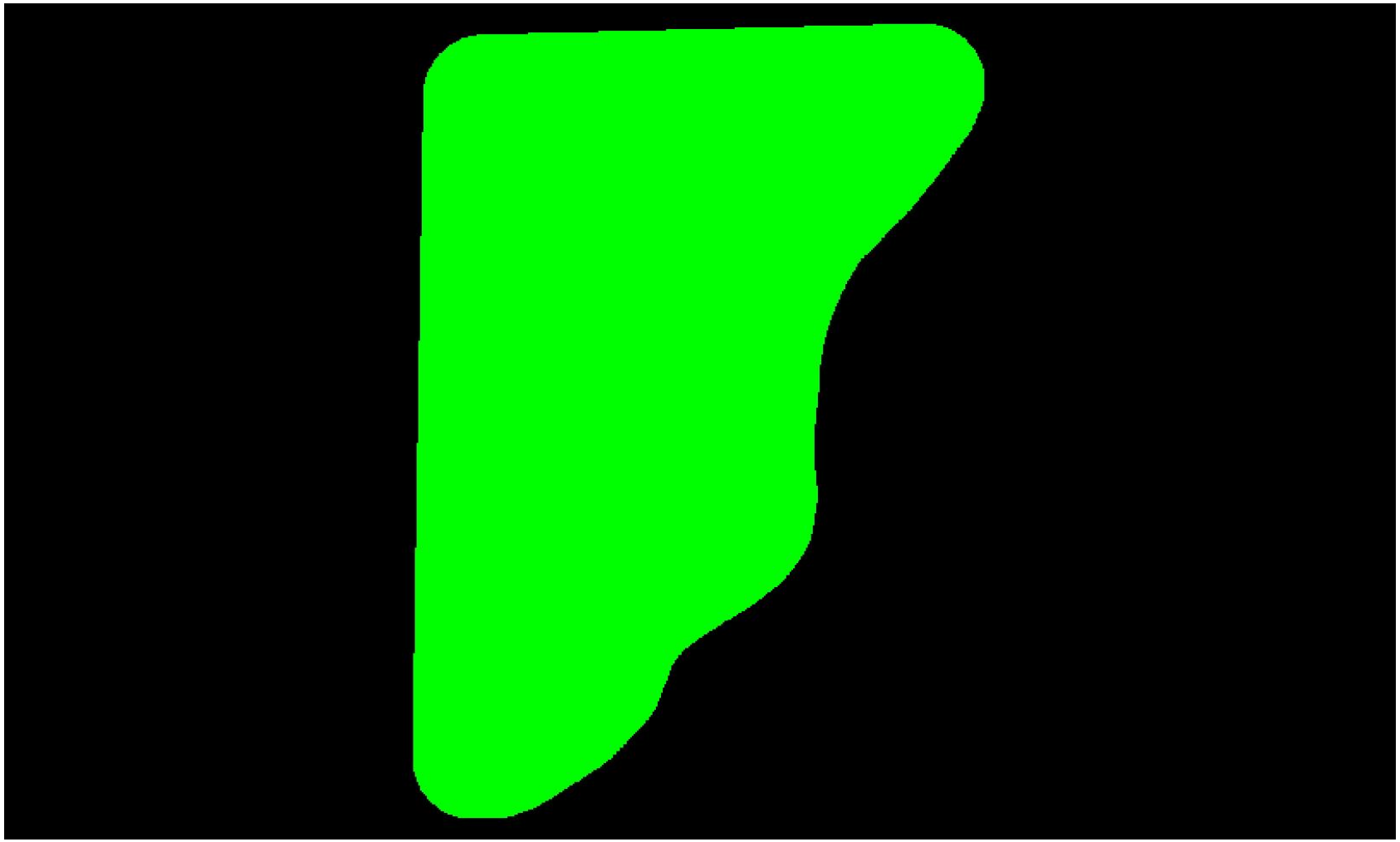
C-5.1 Report on Data Voids

The USGS Lidar Base Specification Version 1.2 states: "Data voids, in lidar, are gaps in the point cloud coverage, caused by surface absorbance or refraction of the lidar pulse (or both absorbance and refraction simultaneously), instrument or processing anomalies or failure, obstruction of the lidar pulse, or improper collection because of flight plans. A data void is considered to be any area greater than or equal to 4(ANPS2), which is measured using first returns only. Data voids within a single swath are not acceptable, except in the following circumstances:
(1) where caused by water bodies.
(2) where caused by areas of low near infrared (NIR) reflectivity such as asphalt or composition roofing, or
(3) where appropriately filled in by another swath. "

The purpose of this section is to show graphically where possible lidar data voids are located. Data voids can be caused by a lack of coverage at the time of collection, water bodies not reflecting the laser beam back to the receiver, lidar occlusions caused by objects above ground like tall buildings, etc. Not all data voids are problematic. The intention of this test is to isolate the first example of lidar data voids - a lack of coverage at the time of collection. A close inspection must be done on the results to determine if the lidar coverage was collected and processed to meet the intended specifications.

Data Source - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\LiDAR\01_Boresight\Rio_Grande\LAS
Y:\Mapping\Projects\65219750_NM_NRCS_Central\Admin\QA_QC\04_17_2018_Middle_Rio_Grande_East\C_5\Area1\Boresighted_DataVoids_SingleFile.jp2

C-5.1 Report on Data Voids



Cell size: 2.840 Meter

Green: Cells containing at least 1 first return lidar point (number of cells = 104,405)
Red: Cells containing no first return lidar points (number of cells = 00)
Background Color: Null data

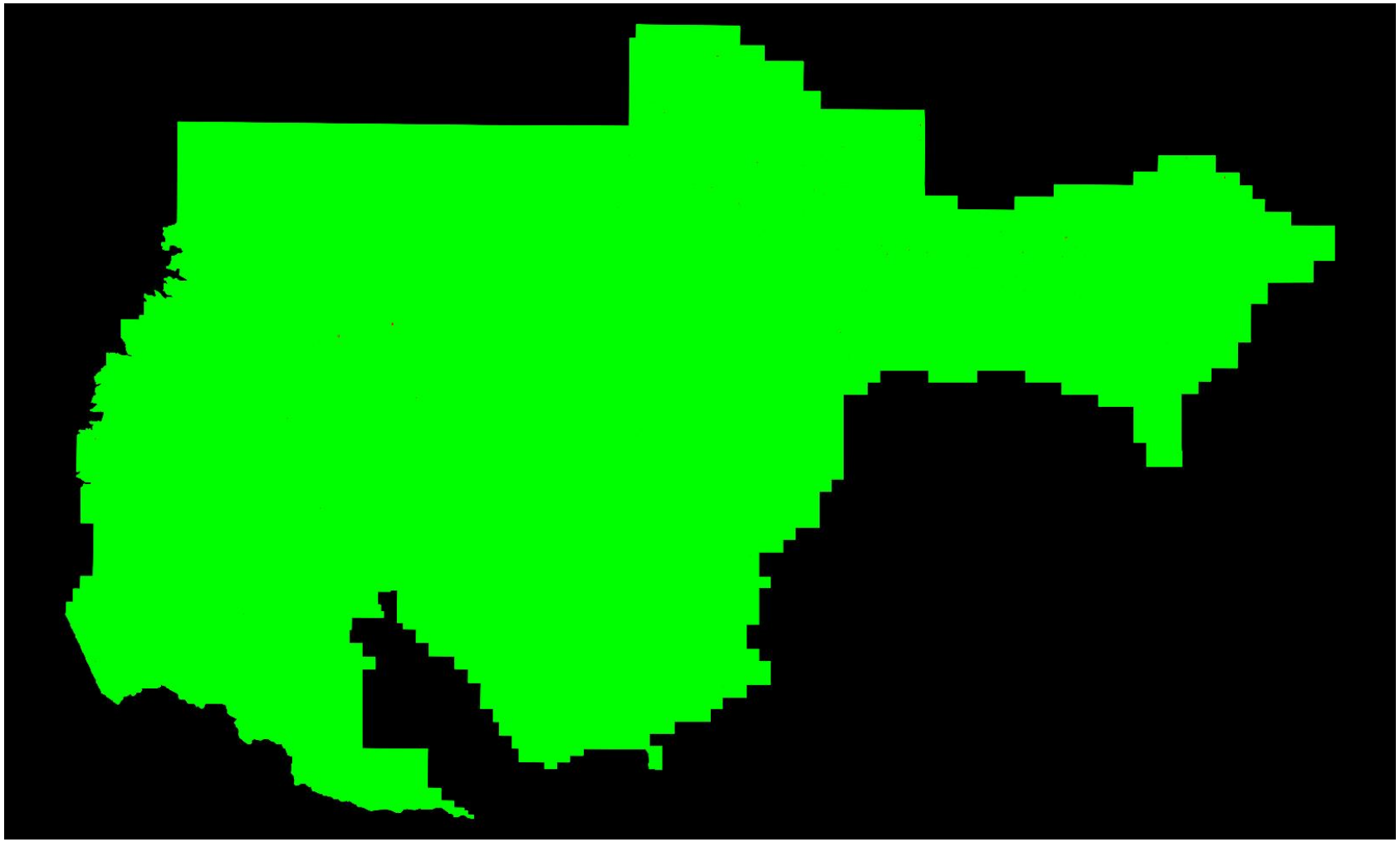
C-5.2 Report on Data Voids

The USGS Lidar Base Specification Version 1.2 states: "Data voids, in lidar, are gaps in the point cloud coverage, caused by surface absorbance or refraction of the lidar pulse (or both absorbance and refraction simultaneously), instrument or processing anomalies or failure, obstruction of the lidar pulse, or improper collection because of flight plans. A data void is considered to be any area greater than or equal to 4(ANPS2), which is measured using first returns only. Data voids within a single swath are not acceptable, except in the following circumstances:
(1) where caused by water bodies.
(2) where caused by areas of low near infrared (NIR) reflectivity such as asphalt or composition roofing, or
(3) where appropriately filled in by another swath. "

The purpose of this section is to show graphically where possible lidar data voids are located. Data voids can be caused by a lack of coverage at the time of collection, water bodies not reflecting the laser beam back to the receiver, lidar occlusions caused by objects above ground like tall buildings, etc. Not all data voids are problematic. The intention of this test is to isolate the first example of lidar data voids - a lack of coverage at the time of collection. A close inspection must be done on the results to determine if the lidar coverage was collected and processed to meet the intended specifications.

Data Source - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\LiDAR\01_Boresight\Rio_Grande\LAS
Y:\Mapping\Projects\65219750_NM_NRCS_Central\Admin\QA_QC\04_17_2018_Middle_Rio_Grande_East\C_5\Area2\Boresighted_DataVoids_SingleFile.jp2

C-5.2 Report on Data Voids



Cell size: 2.840 Meter

- Green: Cells containing at least 1 first return lidar point (number of cells = 1,015,101,603)
- Red: Cells containing no first return lidar points (number of cells = 61,635)
- Background Color: Null data

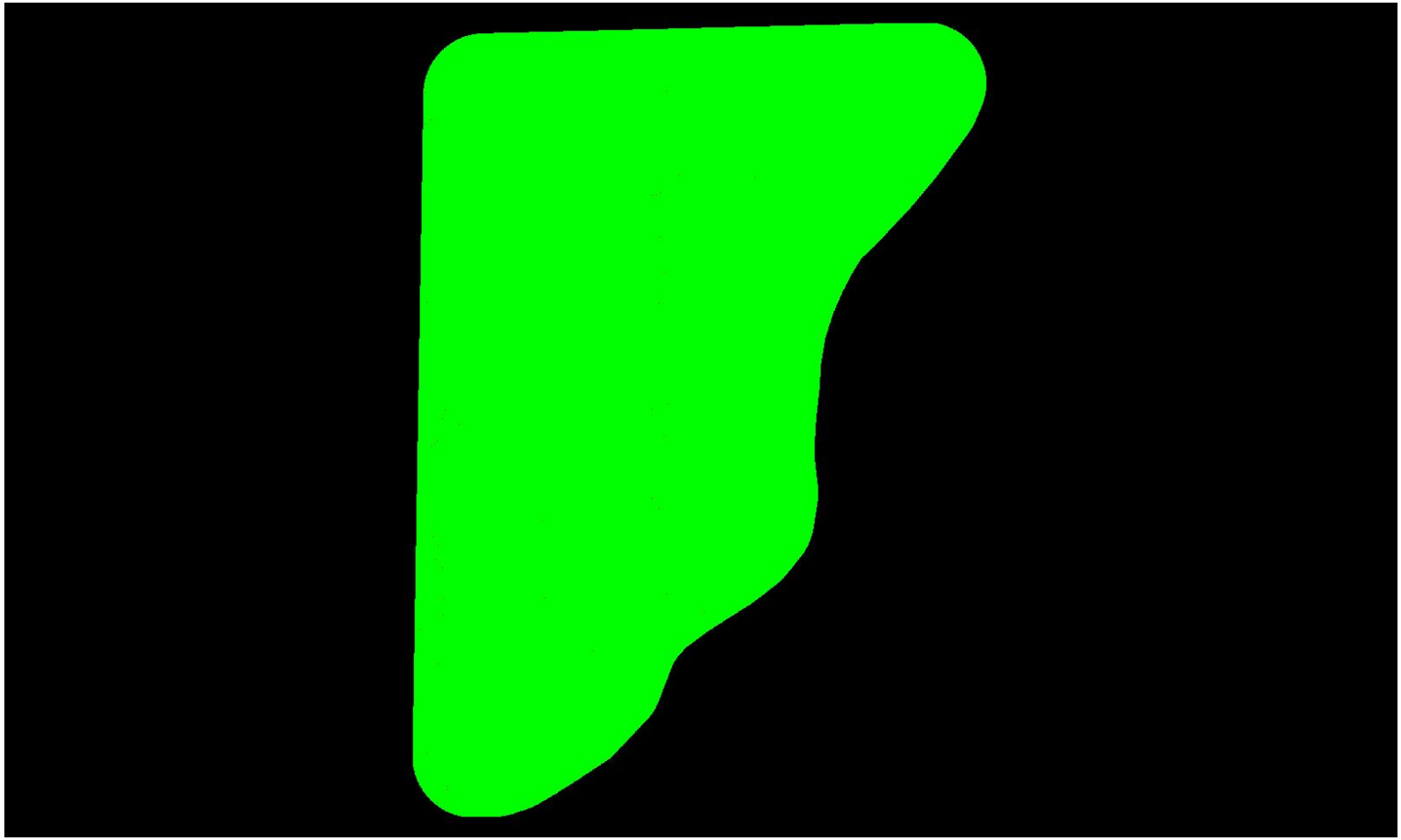
C-6.1.1 Report on Spatial Distribution and Regularity

The USGS Lidar Base Specification Version 1.2 states: "The spatial distribution of geometrically usable points will be uniform and regular. Although lidar instruments do not produce regularly gridded points, collections shall be planned and executed to produce an aggregate first return point cloud that approaches a regular lattice of points, rather than a collection of widely spaced, high-density profiles of the terrain. The regularity of the point pattern and density throughout the dataset is important and will be assessed by using the following steps:
(1) Generating a density grid from the data with cell sizes equal to twice the design ANPS and a radius equal to the design ANPS.
(2) Ensuring at least 90 percent of the cells in the grid contain at least one lidar point.
(3) Using individual (single) swaths, with only the first return points located within the geometrically usable center part (typically 95 percent) of each swath.
(4) Excluding acceptable data voids previously identified in this specification.
The process described in this section relates only to regular and uniform point distribution. The process does not relate to, nor can it be used for, the assessment of NPS or ANPS. The USGS–NGP may allow lower passing thresholds for this requirement in areas of substantial relief where maintaining a regular and uniform point distribution is impractical."

The purpose of this section is to show graphically where unacceptable lidar spatial distributions are located. Lidar spatial distribution can be affected by problems in flight planning (e.g., incorrect scan frequency / pulse rate pairing) or flight execution (e.g., strong headwinds or tailwinds), a lack of coverage at the time of collection, water bodies not reflecting the laser beam back to the receiver, lidar occlusions caused by objects above ground like tall buildings, etc. Not all lidar spatial distribution violations are truly problematic. The intention of this test is to isolate the first example of lidar spatial distribution violations - problems in flight planning or flight execution. A close inspection must be done on the results to determine if the lidar spatial distribution was collected and processed to meet the intended specifications.

Data Source - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\LiDAR\01_Boresight\Rio_Grande\LAS
Y:\Mapping\Projects\65219750_NM_NRCS_Central\Admin\QA_QC\04_17_2018_Middle_Rio_Grande_East\C_6\Area1\Boresighted_SpatialDistribution_SingleFile.jp2

C-6.1.1 Report on Spatial Distribution and Regularity - continued



Cell size: 1.420 Meter

See JPG2000 file for full resolution results

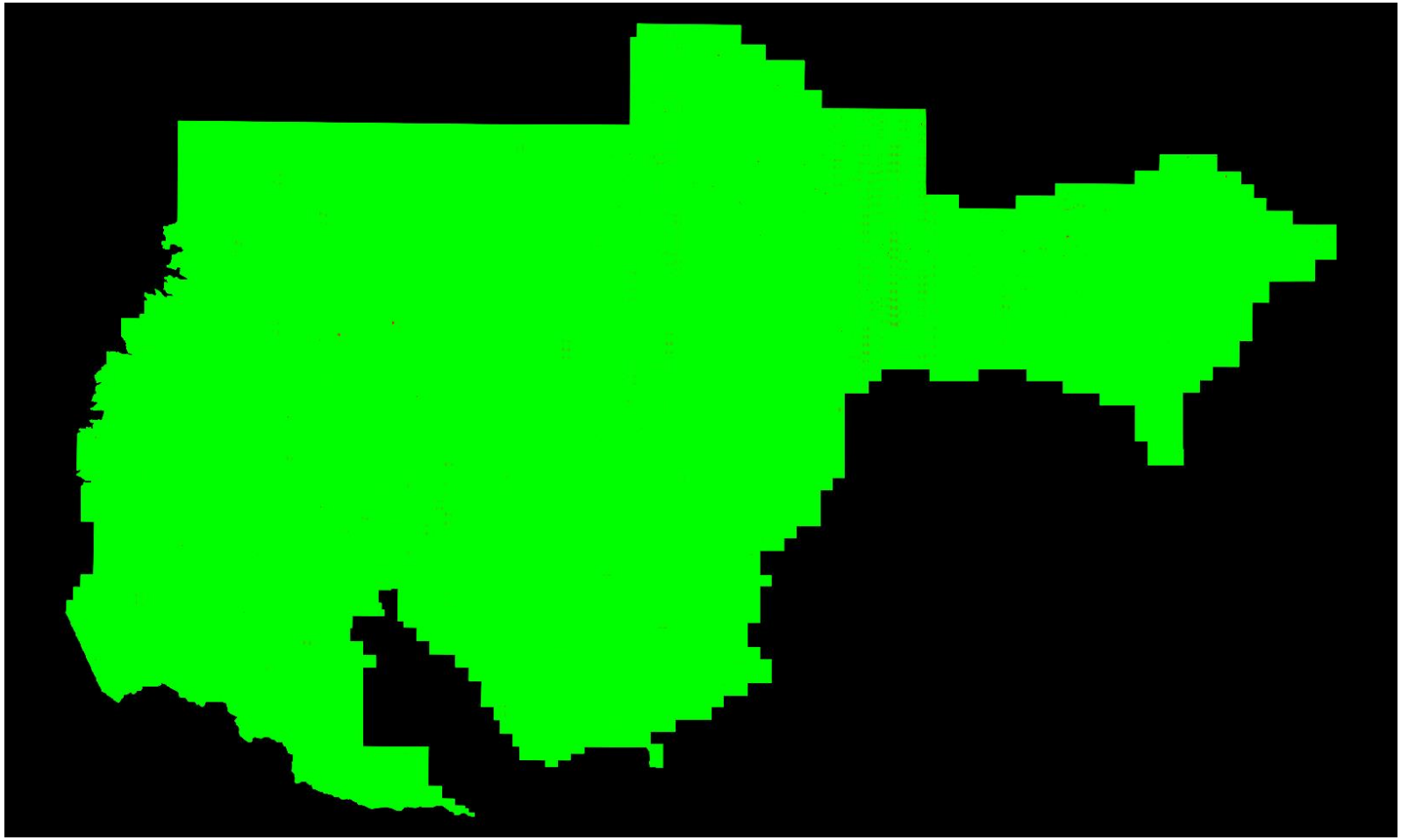
C-6.1.2 Report on Spatial Distribution and Regularity

The USGS Lidar Base Specification Version 1.2 states: "The spatial distribution of geometrically usable points will be uniform and regular. Although lidar instruments do not produce regularly gridded points, collections shall be planned and executed to produce an aggregate first return point cloud that approaches a regular lattice of points, rather than a collection of widely spaced, high-density profiles of the terrain. The regularity of the point pattern and density throughout the dataset is important and will be assessed by using the following steps:
(1) Generating a density grid from the data with cell sizes equal to twice the design ANPS and a radius equal to the design ANPS.
(2) Ensuring at least 90 percent of the cells in the grid contain at least one lidar point.
(3) Using individual (single) swaths, with only the first return points located within the geometrically usable center part (typically 95 percent) of each swath.
(4) Excluding acceptable data voids previously identified in this specification.
The process described in this section relates only to regular and uniform point distribution. The process does not relate to, nor can it be used for, the assessment of NPS or ANPS. The USGS–NGP may allow lower passing thresholds for this requirement in areas of substantial relief where maintaining a regular and uniform point distribution is impractical."

The purpose of this section is to show graphically where unacceptable lidar spatial distributions are located. Lidar spatial distribution can be affected by problems in flight planning (e.g., incorrect scan frequency / pulse rate pairing) or flight execution (e.g., strong headwinds or tailwinds), a lack of coverage at the time of collection, water bodies not reflecting the laser beam back to the receiver, lidar occlusions caused by objects above ground like tall buildings, etc. Not all lidar spatial distribution violations are truly problematic. The intention of this test is to isolate the first example of lidar spatial distribution violations - problems in flight planning or flight execution. A close inspection must be done on the results to determine if the lidar spatial distribution was collected and processed to meet the intended specifications.

Data Source - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\LiDAR\01_Boresight\Rio_Grande\LAS
Y:\Mapping\Projects\65219750_NM_NRCS_Central\Admin\QA_QC\04_17_2018_Middle_Rio_Grande_East\C_6\Area2\Boresighted_SpatialDistribution_SingleFile.jp2

C-6.1.2 Report on Spatial Distribution and Regularity - continued



Cell size: 1.420 Meter

See JPG2000 file for full resolution results

C-6.2 Report on Spatial Distribution and Regularity of Individual Swaths

Swath	Percentage of Cells that Contain >= 1

Pass: 439 files (percentage >= 90%)
Fail: 1 files (percentage < 90%)

C-7 Report on Collection Conditions

The USGS Lidar Base Specification Version 1.2 states: "Conditions for collection of lidar data will follow these guidelines: (1) Atmospheric conditions shall be cloud and fog free between the aircraft and ground during all collection operations. (2) Ground conditions shall be snow free. Very light, undrifted snow may be acceptable in special cases, with prior approval. (3) Ground conditions shall be free of extensive flooding or any other type of inundation

Note: Other collection condition requirements are also listed but are unable to be automatically derived with this reporting tool.

The purpose of this section is to provide a hyperlink to a NOAA website that shows the snow depth map for the extent of the lidar at the time of collection.

Ground Conditions:

Flight Date: 12/30/2017
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2017&dm=12&dd=30&dh=23&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

Flight Date: 12/31/2017
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2017&dm=12&dd=31&dh=17&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

Flight Date: 01/01/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=1&dd=1&dh=23&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

Flight Date: 01/02/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=1&dd=2&dh=22&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

C-7 Report on Collection Conditions - Continued

Ground Conditions:

Flight Date: 01/03/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=1&dd=3&dh=22&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

Flight Date: 01/04/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=1&dd=4&dh=23&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

Flight Date: 01/05/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=1&dd=5&dh=18&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

Flight Date: 01/06/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=1&dd=6&dh=23&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

C-7 Report on Collection Conditions - Continued

Ground Conditions:

Flight Date: 01/09/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=1&dd=9&dh=20&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

Flight Date: 01/11/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=1&dd=11&dh=23&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

Flight Date: 01/12/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=1&dd=12&dh=19&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

Flight Date: 01/13/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=1&dd=13&dh=23&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

C-7 Report on Collection Conditions - Continued

Ground Conditions:

Flight Date: 01/14/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=1&dd=14&dh=23&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

Flight Date: 01/17/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=1&dd=17&dh=23&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

Flight Date: 01/18/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=1&dd=18&dh=21&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

Flight Date: 01/19/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=1&dd=19&dh=21&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

C-7 Report on Collection Conditions - Continued

Ground Conditions:

Flight Date: 01/20/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=1&dd=20&dh=20&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

Flight Date: 01/22/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=1&dd=22&dh=20&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

Flight Date: 01/23/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=1&dd=23&dh=23&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

Flight Date: 01/24/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=1&dd=24&dh=0&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

C-7 Report on Collection Conditions - Continued

Ground Conditions:

Flight Date: 01/27/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=1&dd=27&dh=23&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

Flight Date: 01/28/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=1&dd=28&dh=21&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

Flight Date: 01/29/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=1&dd=29&dh=22&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

Flight Date: 01/30/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=1&dd=30&dh=22&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

C-7 Report on Collection Conditions - Continued

Ground Conditions:

Flight Date: 02/01/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=2&dd=1&dh=23&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

Flight Date: 02/02/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=2&dd=2&dh=22&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

Flight Date: 02/03/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=2&dd=3&dh=21&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

Flight Date: 02/04/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=2&dd=4&dh=21&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

C-7 Report on Collection Conditions - Continued

Ground Conditions:

Flight Date: 02/06/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=2&dd=6&dh=23&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

Flight Date: 02/07/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=2&dd=7&dh=0&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

Flight Date: 02/22/2018
http://www.nohrsc.noaa.gov/interactive/html/map.html?mode=pan&extents=us&zoom=&loc=34.3319609961606+N%2C+105.069160779112+W&ql=station&var=ssm_depth&dy=2018&dm=2&dd=22&dh=22&snap=1&o5=1&o6=1&o11=1&o9=1&o13=1&lbl=m&o7=1&min_x=-106.403026462922&min_y=33.503388644374&max_x=-103.735295095301&max_y=35.1605333479473&coord_x=-105.069160779112&coord_y=34.3319609961606&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&width=800&height=450&nw=800&nh=450&h_o=0&font=0&js=1&uc=0

DPH-1.1 Report on ASPRS LAS File Format (Swath Data) - Compliance

The USGS Lidar Base Specification Version 1.2 states: "All processing will be carried out with the understanding that all point deliverables are required to be fully compliant with ASPRS LAS Specification, version 1.4, using Point Data Record Format 6, 7, 8, 9 or 10. Data producers are encouraged to review the LAS Specification version 1.4 in detail (American Society for Photogrammetry and Remote Sensing, 2011)."

The purpose of this section is to show a table of LAS 1.4 compliance test results for each swath file.

Boresighted Files - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\LiDAR\01_Boresight\Rio_Grande\LAS

File	LAS Version/PDRF	System ID	Legacy Point Count	Legacy Return Counts	PSID/FSID Match	Global Encoding	VLRs / EVLRs	WKT	Intensity	Point Count with Bad Return Info

Pass: 299 files
Fail: 141 files

DPH-1.1 Report on ASPRS LAS File Format (Tiled Data) - Compliance

The USGS Lidar Base Specification Version 1.2 states: "All processing will be carried out with the understanding that all point deliverables are required to be fully compliant with ASPRS LAS Specification, version 1.4, using Point Data Record Format 6, 7, 8, 9 or 10. Data producers are encouraged to review the LAS Specification version 1.4 in detail (American Society for Photogrammetry and Remote Sensing, 2011)."

The purpose of this section is to show a table of LAS 1.4 compliance test results for each tiled file.

Classified Files - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\Final_Client_Deliverables\Block2_MiddleRioGrandeEast\point_cloud\tilecls

File	LAS Version/PDRF	System ID	Legacy Point Count	Legacy Return Counts	File Source ID	Global Encoding	VLRs / EVLRs	WKT	Intensity	Point Count with Bad Return Info

Pass: 3827 files
Fail: 0 files

DPH-1.2 Report on ASPRS LAS File Format (Swath Data) - File Integrity

The purpose of this section is to show a table of LAS 1.4 file integrity test results for each swath file.

File	Number of Points Outside Extent	Offset To Point Data	Offset To EVLR	Number Of Points	Number of Points by Return	Number of Duplicate Points

Pass: 440 files
Fail: 0 files

DPH-1.2 Report on ASPRS LAS File Format (Tiled Data) - File Integrity

The purpose of this section is to show a table of LAS 1.4 file integrity test results for each tiled file.

File	Number of Points Outside Extent	Offset To Point Data	Offset To EVLR	Number Of Points	Number of Points by Return	Number of Duplicate Points

Pass: 3827 files
Fail: 0 files

DPH-1.3 Report on ASPRS LAS File Format (Swath Data) - Informational

The purpose of this section is to show a table of LAS 1.4 file informational test results for each swath file.

File	(Xmin, Ymin, Zmin)	(Xmax, Ymax, Zmax)	Extended Scan Angle	Scan Angle Rank	Scanner Channel	Scan Direction	Edge of Flight Line	User Data	Counts for Synthetic	Key-points	Withheld	Overlap
	(369679.31,3707975.777,662.033)	(615183.746,3891577.977,3304.888)	[-6018, 4670]	[-36.108, 28.02]	[0, 0]	[0, 1]	[0, 1]	[0, 0]	0	0	86047702	0

DPH-1.3 Report on ASPRS LAS File Format (Tiled Data) - Informational

The purpose of this section is to show a table of LAS 1.4 file informational test results for each tiled file.

File	(Xmin, Ymin, Zmin)	(Xmax, Ymax, Zmax)	Extended Scan Angle	Scan Angle Rank	Scanner Channel	Scan Direction	Edge of Flight Line	User Data	Counts for Synthetic	Key-points	Withheld	Overlap
	(373023.787,3787420.476,-2145701.852)	(530485.275,3885861.078,9883.657)	[-4386, 4666]	[-26.316, 27.996]	[0, 0]	[0, 1]	[0, 1]	[0, 0]	0	0	24172655	10966560106

DPH-2 Report on Full Waveform (Swath Data)

The USGS Lidar Base Specification Version 1.2 states: "If full waveform data are recorded during collection, the waveform packets shall be delivered. LAS Specification version 1.4 deliverables including waveform data shall use external auxiliary files with the extension .wdp to store waveform packet data. See the LAS Specification version 1.4 for additional information (American Society for Photogrammetry and Remote Sensing, 2011)."

The purpose of this section is to show the presence of waveform data for the lidar swath data.

Boresighted Files - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\LiDAR\01_Boresight\Rio_Grande\LAS

All LAS swath files have no waveform data present.

DPH-2 Report on Full Waveform (Tiled Data)

The purpose of this section is to show the presence of waveform data for the lidar tiled data.

Classified Files - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\Final_Client_Deliverables\Block2_MiddleRioGrandeEast\point_cloud\tilecls

All LAS tiled files have no waveform data present.

DPH-3 Report on Time of Global Positioning System Data (Swath Data)

The USGS Lidar Base Specification Version 1.2 states: "The time of global positioning system (GPS) data shall be recorded as Adjusted GPS Time, at a precision sufficient to allow unique timestamps for each pulse. Adjusted GPS Time is defined to be Standard (or satellite) GPS time minus 109. See the LAS Specification version 1.4 for additional information (American Society for Photogrammetry and Remote Sensing, 2013)."

The purpose of this section is to show the GPS time type within the LAS files for the lidar swath data.

Boresighted Files - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\LiDAR\01_Boresight\Rio_Grande\LAS

All LAS swath files are formatted as Adjusted GPS Time.

DPH-3 Report on Time of Global Positioning System Data (Tiled Data)

The purpose of this section is to show the GPS time type within the LAS files for the lidar tiled data.

Classified Files - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\Final_Client_Deliverables\Block2_MiddleRioGrandeEast\point_cloud\tilecls

All LAS tiled files are formatted as Adjusted GPS Time.

DPH-4 Report on Datums (Swath Data)

The USGS Lidar Base Specification Version 1.2 states: "All data collected shall be tied to the datums listed below: For the Conterminous United States (CONUS), unless otherwise specified by the user and agreed to in advance by the USGS–NGP:The horizontal datum for latitude and longitude and ellipsoid heights will be the North American Datum of 1983 (NAD 83) using the most recently published adjustment of the National Geodetic Survey (NGS) (currently NAD 83, epoch 2010.00). The vertical datum for orthometric heights will be the North American Vertical Datum of 1988 (NAVD 88). The geoid model used to convert between ellipsoid heights and orthometric heights will be the latest hybrid geoid model of NGS, supporting the latest realization of NAD 83 (currently GEOID12B model)."

The purpose of this section is to show the datums of the LAS files for the lidar swath data.

Boresighted Files - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\LiDAR\01_Boresight\Rio_Grande\LAS

The majority of the LAS swath files are defined as:

Horizontal Datum = NAD83 (National Spatial Reference System 2011)
Horizontal EPSG Code = 1116
Vertical Datum = North American Vertical Datum 1988
Vertical EPSG Code = 5103

The minority or outliers of the LAS swath files are defined as:

Horizontal Datum = NAD83 (National Spatial Reference System 2007)
Horizontal EPSG Code = 6759
Vertical Datum =
Vertical EPSG Code =

All files should have consistent values.

DPH-4 Report on Datums (Tiled Data)

The purpose of this section is to show the datums of the LAS files for the lidar tiled data.

Classified Files - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\Final_Client_Deliverables\Block2_MiddleRioGrandeEast\point_cloud\tilecls

All LAS tiled files are defined as:

Horizontal Datum = NAD83 (National Spatial Reference System 2011)
Horizontal EPSG Code = 1116
Vertical Datum = North American Vertical Datum 1988
Vertical EPSG Code = 5103

DPH-5 Report on Coordinate Reference System (Swath Data)

The USGS Lidar Base Specification Version 1.2 states: "Lidar data for CONUS will be processed and delivered in the most accurate Coordinate Reference System (CRS) available for a project location, usually State Plane Coordinate System (SPCS) or a state system. Universal Transverse Mercator (UTM) also may be used, particularly when a single suitable local SPCS is not available, UTM is needed for compatibility with existing data for the area, or is needed for other reasons. Other CRSs may be used with prior approval from the USGS–NGP. For Alaska, American Samoa, Commonwealth of the Northern Mariana Islands, Guam, Hawaii, Puerto Rico, U.S. Virgin Islands, and other areas, the horizontal and vertical CRS (specifically including the units) shall be specified and agreed to in advance of collection by the USGS–NGP and all collection partners. In all cases, the CRS that is used shall be recognized and published by the European Petroleum Survey Group (EPSG) and correctly recognized by industry standard geographic information system (GIS) software applications."

The purpose of this section is to show the coordinate reference systems of the LAS files for the lidar swath data.

Boresighted Files - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\LiDAR\01_Boresight\Rio_Grande\LAS

The majority of the LAS swath files are defined as:

EPSG Code = 6342
Coordinate Reference System = NAD83(2011) / UTM zone 13N

The minority or outliers of the LAS swath files are defined as:

EPSG Code = 3720
Coordinate Reference System = NAD83(NSRS2007) / UTM zone 13N

All files should have consistent values.

DPH-5 Report on Coordinate Reference System (Tiled Data)

The purpose of this section is to show the projections of the LAS files for the lidar tiled data.

Classified Files - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\Final_Client_Deliverables\Block2_MiddleRioGrandeEast\point_cloud\tilecls

All LAS tiled files are defined as:

EPSG Code = 6342
Coordinate Reference System = NAD83(2011) / UTM zone 13N

DPH-6 Report on Units of Reference (Swath Data)

The USGS Lidar Base Specification Version 1.2 states: "All references to the unit of measure 'Feet' or 'Foot' shall specify 'International', 'Intl', 'U.S. Survey', or 'US'."

The purpose of this section is to show the horizontal and vertical units of the LAS files for the lidar swath data.

Boresighted Files - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\LiDAR\01_Boresight\Rio_Grande\LAS

The majority of the LAS swath files are defined as:

Horizontal Unit = Meter
Vertical Unit = Meter

The minority or outliers of the LAS swath files are defined as:

Horizontal Unit = Meter
Vertical Unit =

All files should have consistent values.

DPH-6 Report on Units of Reference (Tiled Data)

The purpose of this section is to show the horizontal and vertical units of the LAS files for the lidar tiled data.

Classified Files - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\Final_Client_Deliverables\Block2_MiddleRioGrandeEast\point_cloud\tilecls

All LAS tiles files are defined as:

Horizontal Unit = Meter
Vertical Unit = Meter

DPH-7 Report on Swath Identification

The USGS Lidar Base Specification Version 1.2 states: "At the time of its creation and prior to any further processing, each swath shall be assigned a unique File Source Identification (ID), and each point within the swath shall be assigned a Point Source ID equal to the File Source ID. The Point Source ID on each point will be persisted unchanged throughout all processing and delivery. See the LAS Specification version 1.4 (American Society for Photogrammetry and Remote Sensing, 2011)."

The purpose of this section is to report on the File Source ID and Point Source ID values for the lidar swath data. Note that sub-swaths of original swaths (see DPH-9) may violate the unique values specification described in this test.

Boresighted Files - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\LiDAR\01_Boresight\Rio_Grande\LAS

There are 440 unique Point Source IDs.
There are 440 unique File Source IDs.
0 files are in violation with duplicated File Source ID or Point Source ID values.

DPH-8 Report on Point Families (Swath Data)

The USGS Lidar Base Specification Version 1.2 states: "Point families (multiple return 'children' of a single 'parent' pulse) will be maintained throughout all processing before tiling. Multiple returns from a given pulse will be stored in sequential (collected) order."

The purpose of this section is to report on the presence and integrity of point families for the lidar swath data.

Boresighted Files - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\LiDAR\01_Boresight\Rio_Grande\LAS

All LAS swath files have point families present.

DPH-8 Report on Point Families (Tiled Data)

The purpose of this section is to report on the presence and integrity of point families for the lidar tiled data.

Classified Files - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\Final_Client_Deliverables\Block2_MiddleRioGrandeEast\point_cloud\tilecls

All LAS tiled files have point families present.

DPH-9 Report on Swath Size and Segmentation (Swath Data)

The USGS Lidar Base Specification Version 1.2 states: "The widespread adoption of 64-bit operating systems in mainstream computing (most notably Windows-7, 64-bit or newer operating systems) has obviated the earlier need for 2 GB limits on swath file sizes. Unless otherwise required by the data producer, lidar swaths may be of any file size supported within a 64-bit computing system. In cases where segmentation of the swaths is required by the data producer, the following requirements apply:

(1) Subswath segments of a given original swath will be of comparable size.
(2) Each subswath shall retain the File Source ID of the original complete swath.
(3) Points within each subswath shall retain the Point Source ID of the original complete swath.
(4) Each subswath file shall be named identically to the original complete swath, with the addition of an ordered alphabetic suffix to the name ("-a," "-b," …, "-n"). The order of the named subswaths shall be consistent with the collection order of the points ("-a" will be the first subswath; "-n" will be the last subswath).
(5) Point families will be maintained intact within each subswath.
(6) Subswaths will be broken at the edge of the scan line."

The purpose of this section is to show the file sizes of the LAS files for the lidar swath data.

Boresighted Files - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\LiDAR\01_Boresight\Rio_Grande\LAS

File	File Size (bytes)	MB	GB
L012-P-180104_A_5060382_1_r.las	1,402,366,749	1337.401	1.306
L013-P-180104_A_5060382_1_r.las	1,835,011,119	1750.003	1.709
L014-P-180104_A_5060382_1_r.las	2,207,590,021	2105.322	2.056
L015-P-180104_A_5060382_1_r.las	2,653,975,559	2531.028	2.472
L016-P-171230_A_5060314_1_r.las	2,413,944,207	2302.117	2.248
L017-P-171230_A_5060314_1_r.las	2,896,480,539	2762.299	2.698
L018-P-171230_A_5060314_1_r.las	2,608,183,953	2487.358	2.429
L019-P-171230_A_5060314_1_r.las	2,686,775,795	2562.309	2.502
L020-P-171230_A_5060314_1_r.las	2,817,708,413	2687.176	2.624
L021-P-171230_A_5060314_1_r.las	4,165,733,405	3972.753	3.880
L022-P-171230_A_5060314_1_r.las	5,610,601,977	5350.687	5.225
L023-P-171230_A_5060314_1_r.las	5,865,407,139	5593.688	5.463
L024-P-171230_A_5060314_1_r.las	5,657,146,099	5395.075	5.269
L025-P-171230_A_5060314_1_r.las	5,829,590,687	5559.531	5.429
L026-P-171230_A_5060314_1_r.las	5,373,604,605	5124.669	5.005

DPH-9 Report on Swath Size and Segmentation (Swath Data) - continued

File	File Size (bytes)	MB	GB
L027-P-171230_B_5060314_1_r.las	5,375,636,367	5126.606	5.006
L028-P-171230_B_5060314_1_r.las	4,988,501,901	4757.406	4.646
L029-P-171230_B_5060314_1_r.las	5,174,758,477	4935.034	4.819
L030-P-171230_B_5060314_1_r.las	4,909,085,267	4681.669	4.572
L031-P-171230_B_5060314_1_r.las	5,131,378,155	4893.664	4.779
L032-P-171230_B_5060314_1_r.las	4,824,813,835	4601.301	4.493
L033-P-171230_B_5060314_1_r.las	4,870,311,567	4644.691	4.536
L034-P-171230_B_5060314_1_r.las	4,754,176,071	4533.936	4.428
L035-P-171230_B_5060314_1_r.las	4,731,807,237	4512.603	4.407
L036-P-171231_A_5060314_1_r.las	4,603,418,081	4390.162	4.287
L037-P-171231_A_5060314_1_r.las	4,908,587,247	4681.194	4.571
L038-P-171231_A_5060314_1_r.las	4,838,390,451	4614.249	4.506
L039-P-171231_A_5060314_1_r.las	4,719,360,485	4500.733	4.395
L040-P-171231_A_5060314_1_r.las	4,747,485,263	4527.555	4.421
L041-P-171231_A_5060314_1_r.las	4,744,675,703	4524.875	4.419
L042-P-180101_A_5060382_1_r.las	5,352,911,849	5104.935	4.985
L043-P-180101_A_5060382_1_r.las	5,517,525,261	5261.922	5.139
L044-P-180101_A_5060382_1_r.las	5,141,313,591	4903.139	4.788
L045-P-180101_A_5060382_1_r.las	6,143,524,359	5858.921	5.722
L046-P-180101_A_5060382_1_r.las	5,005,174,113	4773.306	4.661
L047-P-180101_A_5060382_1_r.las	6,156,655,263	5871.444	5.734
L048-P-180102_A_5060314_1_r.las	5,316,167,353	5069.892	4.951
L049-P-180102_A_5060314_1_r.las	5,016,203,523	4783.824	4.672
L050-P-180102_A_5060314_1_r.las	4,728,328,607	4509.286	4.404

DPH-9 Report on Swath Size and Segmentation (Swath Data) - continued

File	File Size (bytes)	MB	GB
L051-P-180102_A_5060314_1_r.las	4,701,020,767	4483.243	4.378
L052-P-180102_A_5060314_1_r.las	4,652,822,085	4437.277	4.333
L053-P-180102_A_5060314_1_r.las	2,862,835,203	2730.212	2.666
L053-P-180103_C_5060314_2_r.las	4,641,689,749	4426.660	4.323
L054-P-180102_B_5060314_1_r.las	4,767,598,349	4546.736	4.440
L055-P-180102_B_5060314_1_r.las	4,705,723,313	4487.727	4.383
L056-P-180102_B_5060314_1_r.las	4,707,765,339	4489.675	4.384
L057-P-180102_B_5060314_1_r.las	4,779,892,259	4558.460	4.452
L058-P-180102_B_5060314_1_r.las	4,776,251,333	4554.988	4.448
L059-P-180102_B_5060314_1_r.las	4,806,400,659	4583.741	4.476
L060-P-180103_A_5060314_1_r.las	4,729,912,475	4510.796	4.405
L061-P-180103_A_5060314_1_r.las	4,768,339,051	4547.442	4.441
L062-P-180103_A_5060314_1_r.las	4,779,526,845	4558.112	4.451
L063-P-180103_A_5060314_1_r.las	4,847,033,841	4622.492	4.514
L064-P-180103_A_5060314_1_r.las	4,797,034,305	4574.808	4.468
L065-P-180103_A_5060314_1_r.las	4,861,419,097	4636.211	4.528
L066-P-180103_A_5060314_1_r.las	3,800,325,081	3624.272	3.539
L066-P-180201_B_5060382_2_s.las	1,709,204,758	1630.025	1.592
L067-P-180103_B_5060314_1_r.las	4,664,837,217	4448.735	4.344
L068-P-180103_B_5060314_1_r.las	4,801,781,583	4579.336	4.472
L069-P-180103_B_5060314_1_r.las	4,736,209,253	4516.801	4.411
L070-P-180103_B_5060314_1_r.las	3,013,996,547	2874.371	2.807
L070-P-180105_A_5060382_2_r.las	8,831,744,689	8422.608	8.225
L071-P-180103_C_5060314_1_r.las	5,809,783,835	5540.642	5.411

DPH-9 Report on Swath Size and Segmentation (Swath Data) - continued

File	File Size (bytes)	MB	GB
L071-P-180104_A_5060314_2_r.las	6,389,862,551	6093.848	5.951
L072-P-180104_A_5060314_1_r.las	6,798,510,689	6483.565	6.332
L073-P-180104_A_5060314_1_r.las	6,532,057,943	6229.456	6.083
L074-P-180104_A_5060314_1_r.las	6,879,156,677	6560.475	6.407
L075-P-180104_A_5060314_1_r.las	6,519,883,035	6217.845	6.072
L076-P-180104_B_5060314_1_r.las	6,403,288,427	6106.652	5.964
L077-P-180104_B_5060314_1_r.las	7,000,212,525	6675.923	6.519
L078-P-180105_A_5060382_1_r.las	7,210,765,495	6876.722	6.716
L079-P-180105_A_5060382_1_r.las	8,932,859,415	8519.039	8.319
L080-P-180104_A_5060382_1_r.las	7,762,529,689	7402.925	7.229
L081-P-180104_A_5060382_1_r.las	7,121,951,009	6792.022	6.633
L082-P-180104_A_5060382_1_r.las	8,097,457,261	7722.337	7.541
L083-P-180104_A_5060382_1_r.las	7,279,599,725	6942.367	6.780
L084-P-180105_A_5060382_1_r.las	7,075,773,093	6747.983	6.590
L085-P-180105_A_5060382_1_r.las	8,098,586,451	7723.414	7.542
L086-P-180109_A_5060382_1_r.las	6,782,071,417	6467.887	6.316
L087-P-180109_A_5060382_1_r.las	8,010,096,635	7639.023	7.460
L088-P-180109_A_5060382_1_r.las	6,465,578,253	6166.056	6.022
L089-P-180109_A_5060382_1_r.las	8,096,470,573	7721.396	7.540
L090-P-180109_A_5060382_1_r.las	6,233,080,595	5944.329	5.805
L091-P-180109_A_5060382_1_r.las	7,877,823,651	7512.878	7.337
L092-P-180109_A_5060382_1_r.las	6,213,118,993	5925.292	5.786
L093-P-180109_A_5060382_1_r.las	6,884,650,673	6565.715	6.412
L094-P-180105_A_5060314_1_r.las	5,315,678,327	5069.426	4.951

DPH-9 Report on Swath Size and Segmentation (Swath Data) - continued

File	File Size (bytes)	MB	GB
L095-P-180105_A_5060314_1_r.las	5,450,139,901	5197.658	5.076
L095-P-180105_A_5060314_2_r.las	5,604,123,215	5344.508	5.219
L096-P-180105_A_5060314_1_r.las	5,461,912,713	5208.886	5.087
L097-P-180105_A_5060314_1_r.las	5,491,985,927	5237.566	5.115
L098-P-180105_A_5060314_1_r.las	5,529,026,757	5272.891	5.149
L099-P-180105_A_5060314_1_r.las	5,450,894,355	5198.378	5.077
L100-P-180105_A_5060314_1_r.las	5,414,415,339	5163.589	5.043
L101-P-180105_A_5060314_1_r.las	5,495,878,105	5241.278	5.118
L102-P-180105_A_5060314_1_r.las	5,572,593,765	5314.440	5.190
L103-P-180105_A_5060314_1_r.las	5,747,470,965	5481.215	5.353
L104-P-180105_A_5060314_1_r.las	5,544,682,759	5287.822	5.164
L105-P-180111_A_5060382_1_r.las	6,258,761,015	5968.820	5.829
L106-P-180111_A_5060382_1_r.las	4,071,867,015	3883.235	3.792
L107-P-180111_A_5060382_1_r.las	4,665,269,789	4449.148	4.345
L108-P-180111_A_5060382_1_r.las	3,905,163,223	3724.254	3.637
L109-P-180112_A_5060314_1_r.las	4,037,192,541	3850.167	3.760
L110-P-180112_A_5060314_1_r.las	3,825,308,365	3648.098	3.563
L111-P-180112_A_5060314_1_r.las	4,161,101,957	3968.336	3.875
L112-P-180112_A_5060314_1_r.las	3,864,251,419	3685.237	3.599
L113-P-180112_A_5060314_1_r.las	4,189,962,981	3995.860	3.902
L114-P-180112_A_5060314_1_r.las	4,151,696,077	3959.366	3.867
L115-P-180112_A_5060314_1_r.las	4,006,261,901	3820.669	3.731
L116-P-180112_A_5060314_1_r.las	4,199,063,249	4004.539	3.911
L117-P-180112_A_5060314_1_r.las	4,467,891,265	4260.913	4.161

DPH-9 Report on Swath Size and Segmentation (Swath Data) - continued

File	File Size (bytes)	MB	GB
L118-P-180112_A_5060314_1_r.las	4,050,250,043	3862.619	3.772
L119-P-180112_A_5060314_1_r.las	4,762,988,473	4542.340	4.436
L120-P-180112_A_5060314_1_r.las	4,167,004,865	3973.966	3.881
L121-P-180112_B_5060314_1_r.las	4,696,657,745	4479.082	4.374
L122-P-180112_B_5060314_1_r.las	4,669,763,099	4453.433	4.349
L123-P-180112_B_5060314_1_r.las	4,567,378,021	4355.791	4.254
L124-P-180118_A_5060382_1_r.las	4,207,550,743	4012.633	3.919
L125-P-180118_A_5060382_1_r.las	4,687,299,845	4470.157	4.365
L126-P-180118_A_5060382_1_r.las	4,580,266,175	4368.082	4.266
L127-P-180118_A_5060382_1_r.las	4,724,161,649	4505.312	4.400
L128-P-180118_A_5060382_1_r.las	4,337,148,843	4136.227	4.039
L129-P-180112_B_5060314_1_r.las	5,107,793,981	4871.172	4.757
L130-P-180112_B_5060314_1_r.las	5,474,778,303	5221.155	5.099
L131-P-180112_B_5060314_1_r.las	4,874,150,831	4648.352	4.539
L132-P-180112_B_5060314_1_r.las	4,817,927,327	4594.734	4.487
L133-P-180112_A_5060382_1_r.las	5,428,852,027	5177.357	5.056
L134-P-180112_A_5060382_1_r.las	1,646,149,141	1569.890	1.533
L134-P-180118_A_5060382_2_r.las	3,932,339,299	3750.171	3.662
L135-P-180118_A_5060382_1_r.las	3,725,842,977	3553.241	3.470
L136-P-180118_A_5060382_1_r.las	3,770,635,819	3595.959	3.512
L137-P-180118_A_5060382_1_r.las	3,464,806,717	3304.297	3.227
L138-P-180118_A_5060382_1_r.las	3,446,937,955	3287.256	3.210
L139-P-180118_A_5060382_1_r.las	3,138,095,469	2992.721	2.923
L140-P-180118_A_5060382_1_r.las	2,294,136,029	2187.859	2.137

DPH-9 Report on Swath Size and Segmentation (Swath Data) - continued

File	File Size (bytes)	MB	GB
L141-P-180118_A_506038 2_1_r.las	2,162,608,547	2062.424	2.014
L142-P-180111_A_506031 4_1_r.las	1,854,344,771	1768.441	1.727
L143-P-180111_A_506031 4_1_r.las	1,947,600,227	1857.376	1.814
L144-P-180111_A_506031 4_1_r.las	1,843,163,511	1757.778	1.717
L145-P-180111_A_506031 4_1_r.las	1,835,764,837	1750.722	1.710
L146-P-180111_A_506031 4_2_r.las	1,680,210,605	1602.374	1.565
L146-P-180111_B_506031 4_1_r.las	2,027,600,643	1933.671	1.888
L147-P-180111_B_506031 4_1_r.las	1,398,871,615	1334.068	1.303
L148-P-180111_B_506031 4_1_r.las	1,461,540,149	1393.833	1.361
L160-P-180129_A_506038 2_1_r_P.las	1,501,104,373	1431.565	1.398
L161-P-180129_A_506038 2_1_r_P.las	1,911,581,899	1823.027	1.780
L162-P-180129_A_506038 2_1_r_P.las	2,118,353,993	2020.220	1.973
L163-P-180129_A_506038 2_1_r_P.las	2,166,324,419	2065.968	2.018
L164-P-180129_A_506038 2_1_r_P.las	2,338,416,113	2230.087	2.178
L165-P-180129_A_506038 2_1_r_P.las	2,241,960,963	2138.101	2.088
L166-P-180129_A_506038 2_1_r_P.las	2,399,962,219	2288.782	2.235
L167-P-180129_A_506038 2_1_r_P.las	2,228,498,623	2125.262	2.075
L168-P-180129_A_506038 2_1_r_P.las	2,275,966,001	2170.530	2.120
L169-P-180129_A_506038 2_1_r_P.las	2,119,222,449	2021.048	1.974
L170-P-180129_A_506038 2_1_r_P.las	2,626,300,261	2504.635	2.446
L171-P-180129_A_506038 2_1_r_P.las	2,624,300,409	2502.728	2.444
L172-P-180129_A_506038 2_1_r_P.las	4,053,107,461	3865.344	3.775
L173-P-180129_A_506038 2_1_r_P.las	3,694,741,021	3523.580	3.441
L174-P-180129_A_506038 2_1_r_P.las	4,310,059,155	4110.393	4.014

DPH-9 Report on Swath Size and Segmentation (Swath Data) - continued

File	File Size (bytes)	MB	GB
L175-P-180129_A_5060382_1_r_P.las	4,098,113,069	3908.265	3.817
L176-P-180129_A_5060382_1_r_P.las	4,969,754,013	4739.527	4.628
L177-P-180129_A_5060382_1_r_P.las	4,418,093,065	4213.422	4.115
L178-P-180129_A_5060382_1_r_P.las	5,191,719,371	4951.209	4.835
L179-P-180129_A_5060382_1_r_P.las	4,543,956,205	4333.454	4.232
L180-P-180129_A_5060314_1_r_P.las	4,969,704,353	4739.479	4.628
L181-P-180129_A_5060314_1_r_P.las	5,606,959,679	5347.213	5.222
L182-P-180129_A_5060314_1_r_P.las	5,386,674,223	5137.133	5.017
L183-P-180129_A_5060314_1_r_P.las	5,517,178,407	5261.591	5.138
L184-P-180129_A_5060314_1_r_P.las	5,768,050,321	5500.841	5.372
L185-P-180129_A_5060314_1_r_P.las	5,523,725,887	5267.836	5.144
L186-P-180129_A_5060314_1_r_P.las	6,203,465,327	5916.086	5.777
L187-P-180130_A_5060314_1_r_P.las	5,789,313,321	5521.119	5.392
L188-P-180130_A_5060314_1_r_P.las	5,748,370,599	5482.073	5.354
L189-P-180130_A_5060314_1_r_P.las	5,729,253,863	5463.842	5.336
L190-P-180130_A_5060314_1_r_P.las	5,785,786,037	5517.756	5.388
L191-P-180130_A_5060314_1_r_P.las	5,887,904,061	5615.143	5.484
L192-P-180130_A_5060314_1_r_P.las	5,803,424,403	5534.577	5.405
L192-P-180222_A_5060382_2_s_P.las	776,108,705	740.155	0.723
L192-P-180222_A_5060382_3_s_P.las	954,364,131	910.153	0.889
L193-P-180130_A_5060314_1_r_P.las	5,457,581,867	5204.756	5.083
L193-P-180201_C_5060382_2_r_P.las	7,142,898,987	6811.999	6.652
L194-P-180201_C_5060382_1_r_P.las	5,428,037,233	5176.580	5.055
L195-P-180201_C_5060382_1_r_P.las	7,097,161,603	6768.381	6.610

DPH-9 Report on Swath Size and Segmentation (Swath Data) - continued

File	File Size (bytes)	MB	GB
L196-P-180201_C_5060382_1_r_P.las	5,434,671,329	5182.906	5.061
L197-P-180201_C_5060382_1_r_P.las	7,082,855,819	6754.738	6.596
L198-P-180201_C_5060382_1_r_P.las	6,542,124,203	6239.056	6.093
L199-P-180201_C_5060382_1_r_P.las	8,418,192,005	8028.214	7.840
L200-P-180201_C_5060382_1_r_P.las	7,267,012,103	6930.363	6.768
L201-P-180202_A_5060382_1_r_P.las	7,991,873,263	7621.644	7.443
L202-P-180202_A_5060382_1_r_P.las	7,597,812,475	7245.839	7.076
L203-P-180202_A_5060382_1_r_P.las	7,735,029,333	7376.699	7.204
L204-P-180202_A_5060382_1_r_P.las	7,699,879,977	7343.178	7.171
L205-P-180202_A_5060382_1_r_P.las	7,862,499,939	7498.264	7.323
L206-P-180202_A_5060382_1_r_P.las	8,061,480,991	7688.027	7.508
L207-P-180202_A_5060382_1_r_P.las	8,142,448,121	7765.244	7.583
L208-P-180202_A_5060382_1_r_P.las	8,132,524,495	7755.780	7.574
L209-P-180202_A_5060382_1_r_P.las	8,170,129,167	7791.642	7.609
L210-P-180201_D_5060382_1_r_P.las	7,677,645,769	7321.974	7.150
L211-P-180201_D_5060382_1_r_P.las	7,954,230,925	7585.746	7.408
L212-P-180201_D_5060382_1_r_P.las	7,536,367,391	7187.240	7.019
L213-P-180201_D_5060382_1_r_P.las	8,621,942,787	8222.525	8.030
L214-P-180130_A_5060382_1_r_P.las	7,405,479,311	7062.415	6.897
L215-P-180130_A_5060382_1_r_P.las	8,343,542,687	7957.022	7.771
L216-P-180130_A_5060382_1_r_P.las	6,710,742,669	6399.863	6.250
L217-P-180206_A_5060382_1_r_P.las	8,541,328,527	8145.646	7.955
L218-P-180206_A_5060382_1_r_P.las	7,708,399,997	7351.303	7.179
L219-P-180206_A_5060382_1_r_P.las	7,734,810,321	7376.490	7.204

DPH-9 Report on Swath Size and Segmentation (Swath Data) - continued

File	File Size (bytes)	MB	GB
L220-P-180206_A_506038 2_1_r_P.las	7,433,932,691	7089.551	6.923
L221-P-180206_A_506038 2_1_r_P.las	6,737,296,637	6425.187	6.275
L222-P-180206_A_506038 2_1_r_P.las	6,310,993,727	6018.633	5.878
L223-P-180206_A_506038 2_1_r_P.las	6,846,327,327	6529.167	6.376
L224-P-180206_A_506038 2_1_r_P.las	6,587,915,031	6282.725	6.135
L225-P-180206_A_506038 2_1_r_P.las	6,825,754,701	6509.547	6.357
L226-P-180206_A_506038 2_1_r_P.las	6,608,247,231	6302.116	6.154
L227-P-180204_A_506038 2_1_r_P.las	6,283,580,863	5992.490	5.852
L228-P-180204_A_506038 2_1_r_P.las	6,837,102,797	6520.369	6.368
L229-P-180204_A_506038 2_1_r_P.las	6,375,592,751	6080.239	5.938
L230-P-180204_A_506038 2_1_r_P.las	7,410,681,559	7067.377	6.902
L231-P-180204_A_506038 2_1_r_P.las	6,376,121,601	6080.743	5.938
L232-P-180204_A_506038 2_1_r_P.las	7,390,284,747	7047.925	6.883
L233-P-180204_A_506038 2_1_r_P.las	6,335,967,207	6042.449	5.901
L234-P-180204_A_506038 2_1_r_P.las	7,230,812,165	6895.840	6.734
L235-P-180204_A_506038 2_1_r_P.las	6,200,771,719	5913.517	5.775
L236-P-180204_A_506038 2_1_r_P.las	7,267,076,469	6930.424	6.768
L237-P-180204_A_506038 2_1_r_P.las	5,814,302,897	5544.951	5.415
L238-P-180204_A_506038 2_1_r_P.las	6,663,148,943	6354.474	6.206
L239-P-180203_A_506038 2_1_r_P.las	5,473,756,597	5220.181	5.098
L240-P-180203_A_506038 2_1_r_P.las	6,569,006,285	6264.693	6.118
L241-P-180203_A_506038 2_1_r_P.las	5,344,448,035	5096.863	4.977
L242-P-180203_A_506038 2_1_r_P.las	6,441,667,241	6143.253	5.999
L243-P-180203_A_506038 2_1_r_P.las	5,047,248,329	4813.431	4.701

DPH-9 Report on Swath Size and Segmentation (Swath Data) - continued

File	File Size (bytes)	MB	GB
L244-P-180203_A_506038 2_1_r_P.las	5,973,119,893	5696.411	5.563
L245-P-180203_A_506038 2_1_r_P.las	4,423,666,783	4218.737	4.120
L246-P-180203_A_506038 2_1_r_P.las	4,753,107,763	4532.917	4.427
L247-P-180203_A_506038 2_1_r_P.las	3,512,029,331	3349.332	3.271
L248-P-180203_A_506038 2_1_r_P.las	4,760,440,319	4539.910	4.434
L249-P-180203_A_506038 2_1_r_P.las	2,996,640,397	2857.819	2.791
L250-P-180203_A_506038 2_1_r_P.las	3,854,415,195	3675.857	3.590
L251-P-180203_A_506038 2_1_r_P.las	961,873,277	917.314	0.896
L266-P-180106_A_506038 2_1_r.las	1,795,417,345	1712.243	1.672
L266-P-180113_A_506038 2_2_r.las	833,133,401	794.538	0.776
L267-P-180106_A_506038 2_1_r.las	5,854,652,137	5583.431	5.453
L267-P-180106_A_506038 2_2_r.las	4,797,335,101	4575.095	4.468
L268-P-180106_A_506038 2_1_r.las	6,172,909,539	5886.945	5.749
L269-P-180106_A_506038 2_1_r.las	5,189,579,715	4949.169	4.833
L270-P-180106_A_506031 4_1_r.las	5,304,115,745	5058.399	4.940
L270-P-180106_A_506038 2_2_r.las	7,297,113,965	6959.070	6.796
L270-P-180106_A_506038 2_3_r.las	2,290,258,341	2184.161	2.133
L271-P-180106_A_506031 4_1_r.las	5,338,088,383	5090.798	4.971
L272-P-180106_A_506031 4_1_r.las	5,246,633,567	5003.580	4.886
L273-P-180106_A_506031 4_1_r.las	5,327,760,509	5080.948	4.962
L274-P-180106_A_506031 4_1_r.las	5,254,775,485	5011.344	4.894
L275-P-180106_A_506031 4_1_r.las	5,173,092,827	4933.446	4.818
L276-P-180106_A_506031 4_1_r.las	4,982,978,253	4752.138	4.641
L277-P-180106_A_506031 4_1_r.las	4,938,771,867	4709.980	4.600

DPH-9 Report on Swath Size and Segmentation (Swath Data) - continued

File	File Size (bytes)	MB	GB
L278-P-180106_A_5060314_1_r.las	4,874,891,327	4649.059	4.540
L279-P-180106_A_5060314_1_r.las	4,775,818,301	4554.575	4.448
L280-P-180106_B_5060382_1_r.las	1,576,985,641	1503.931	1.469
L280-P-180106_B_5060382_2_r.las	5,423,771,271	5172.511	5.051
L280-P-180113_A_5060382_3_r.las	5,094,980,919	4858.952	4.745
L281-P-180106_B_5060382_1_r.las	5,582,480,603	5323.868	5.199
L282-P-180106_B_5060382_1_r.las	5,118,305,869	4881.197	4.767
L283-P-180106_B_5060382_1_r.las	5,303,147,387	5057.475	4.939
L284-P-180106_B_5060382_1_r.las	4,915,029,375	4687.337	4.577
L285-P-180113_A_5060382_1_r.las	4,840,733,581	4616.483	4.508
L286-P-180113_A_5060382_1_r.las	6,065,366,157	5784.384	5.649
L287-P-180113_A_5060382_1_r.las	4,996,768,471	4765.290	4.654
L288-P-180113_A_5060382_1_r.las	5,947,118,773	5671.614	5.539
L289-P-180113_A_5060382_1_r.las	5,311,301,681	5065.252	4.947
L290-P-180113_A_5060314_1_r.las	5,304,218,399	5058.497	4.940
L291-P-180113_A_5060314_1_r.las	5,632,671,399	5371.734	5.246
L292-P-180113_A_5060314_1_r.las	5,821,658,659	5551.966	5.422
L293-P-180113_A_5060314_1_r.las	5,641,351,129	5380.012	5.254
L294-P-180113_A_5060314_1_r.las	5,617,597,133	5357.358	5.232
L295-P-180113_A_5060314_1_r.las	5,756,885,637	5490.194	5.362
L296-P-180113_A_5060314_1_r.las	5,823,296,433	5553.528	5.423
L297-P-180113_A_5060314_1_r.las	5,818,913,917	5549.349	5.419
L298-P-180113_A_5060314_1_r.las	5,694,797,801	5430.982	5.304
L299-P-180113_A_5060314_1_r.las	5,971,646,433	5695.006	5.562

DPH-9 Report on Swath Size and Segmentation (Swath Data) - continued

File	File Size (bytes)	MB	GB
L300-P-180113_A_5060314_1_r.las	5,900,163,649	5626.835	5.495
L301-P-180113_A_5060314_1_r.las	6,052,980,023	5772.572	5.637
L302-P-180113_A_5060314_1_r.las	5,840,107,023	5569.560	5.439
L303-P-180113_A_5060314_1_r.las	6,056,726,951	5776.145	5.641
L304-P-180113_A_5060314_1_r.las	6,297,879,067	6006.126	5.865
L305-P-180113_A_5060314_1_r.las	6,367,757,949	6072.767	5.930
L306-P-180113_A_5060314_1_r.las	6,338,563,097	6044.925	5.903
L307-P-180114_A_5060314_1_r.las	6,283,255,669	5992.180	5.852
L308-P-180114_A_5060314_1_r.las	410,595,471	391.574	0.382
L308-P-180114_A_5060314_2_r.las	5,612,597,009	5352.590	5.227
L309-P-180114_A_5060314_1_r.las	6,386,758,745	6090.888	5.948
L310-P-180114_A_5060314_1_r.las	615,286,737	586.783	0.573
L310-P-180114_B_5060314_2_r.las	6,460,228,849	6160.954	6.017
L311-P-180113_B_5060382_1_r.las	6,680,519,705	6371.040	6.222
L312-P-180113_B_5060382_1_r.las	7,467,035,485	7121.120	6.954
L313-P-180113_B_5060382_1_r.las	6,901,656,251	6581.932	6.428
L314-P-180113_B_5060382_1_r.las	7,768,419,855	7408.542	7.235
L315-P-180114_B_5060314_1_r.las	5,276,845,807	5032.392	4.914
L316-P-180114_B_5060314_1_r.las	5,536,483,029	5280.002	5.156
L317-P-180114_B_5060314_1_r.las	5,372,152,665	5123.284	5.003
L318-P-180114_B_5060314_1_r.las	5,495,844,273	5241.246	5.118
L319-P-180114_B_5060314_1_r.las	5,517,572,459	5261.967	5.139
L320-P-180114_B_5060314_1_r.las	5,464,553,601	5211.404	5.089
L321-P-180114_B_5060314_1_r.las	5,534,140,775	5277.768	5.154

DPH-9 Report on Swath Size and Segmentation (Swath Data) - continued

File	File Size (bytes)	MB	GB
L322-P-180114_B_5060314_1_r.las	5,535,453,209	5279.020	5.155
L323-P-180114_B_5060314_1_r.las	5,459,800,023	5206.871	5.085
L324-P-180114_B_5060314_1_r.las	5,369,876,437	5121.113	5.001
L325-P-180117_A_5060314_1_r.las	5,346,070,285	5098.410	4.979
L326-P-180117_A_5060314_1_r.las	5,234,405,227	4991.918	4.875
L327-P-180117_A_5060314_1_r.las	5,203,170,493	4962.130	4.846
L328-P-180117_A_5060314_1_r.las	5,468,492,745	5215.161	5.093
L329-P-180117_A_5060314_1_r.las	5,713,557,097	5448.873	5.321
L330-P-180117_A_5060314_1_r.las	5,694,515,317	5430.713	5.303
L331-P-180117_A_5060314_1_r.las	5,646,735,197	5385.146	5.259
L332-P-180117_A_5060314_1_r.las	5,603,162,853	5343.593	5.218
L333-P-180117_A_5060314_1_r.las	5,476,362,303	5222.666	5.100
L334-P-180117_A_5060314_1_r.las	5,498,370,091	5243.654	5.121
L335-P-180117_A_5060314_1_r.las	5,287,031,153	5042.106	4.924
L336-P-180117_A_5060314_1_r.las	5,070,564,747	4835.667	4.722
L337-P-180117_A_5060314_1_r.las	5,084,032,061	4848.511	4.735
L338-P-180117_A_5060314_1_r.las	5,224,577,645	4982.546	4.866
L339-P-180117_A_5060314_1_r.las	4,926,460,893	4698.239	4.588
L340-P-180117_A_5060314_1_r.las	5,240,714,735	4997.935	4.881
L341-P-180117_A_5060314_1_r.las	5,259,622,877	5015.967	4.898
L342-P-180117_A_5060314_1_r.las	5,323,978,945	5077.342	4.958
L343-P-180117_A_5060314_1_r.las	4,999,757,405	4768.140	4.656
L344-P-180117_A_5060314_1_r.las	4,940,424,983	4711.556	4.601
L345-P-180117_A_5060382_1_r.las	4,730,493,149	4511.350	4.406

DPH-9 Report on Swath Size and Segmentation (Swath Data) - continued

File	File Size (bytes)	MB	GB
L346-P-180117_A_5060382_1_r.las	5,050,471,315	4816.505	4.704
L347-P-180117_A_5060382_1_r.las	4,700,696,653	4482.934	4.378
L348-P-180117_A_5060382_1_r.las	5,081,295,505	4845.901	4.732
L349-P-180117_A_5060314_1_r.las	4,943,747,731	4714.725	4.604
L350-P-180117_A_5060314_1_r.las	5,061,355,769	4826.885	4.714
L351-P-180118_A_5060314_1_r.las	4,946,101,043	4716.970	4.606
L352-P-180118_A_5060314_1_r.las	5,095,621,733	4859.564	4.746
L353-P-180118_A_5060314_1_r.las	5,002,982,407	4771.216	4.659
L354-P-180118_A_5060314_1_r.las	4,909,530,285	4682.093	4.572
L355-P-180118_A_5060314_1_r.las	4,873,126,353	4647.375	4.538
L356-P-180118_A_5060314_1_r.las	4,887,524,213	4661.106	4.552
L357-P-180118_A_5060314_1_r.las	5,187,645,393	4947.324	4.831
L358-P-180118_A_5060314_1_r.las	4,822,323,931	4598.926	4.491
L359-P-180118_A_5060314_1_r.las	4,837,838,641	4613.722	4.506
L360-P-180118_A_5060314_1_r.las	5,123,024,851	4885.697	4.771
L361-P-180119_A_5060382_1_r.las	4,709,411,335	4491.245	4.386
L362-P-180119_A_5060382_1_r.las	6,213,732,097	5925.877	5.787
L363-P-180119_A_5060382_1_r.las	5,350,290,605	5102.435	4.983
L364-P-180119_A_5060382_1_r.las	5,706,107,173	5441.768	5.314
L365-P-180119_A_5060382_1_r.las	5,207,860,379	4966.603	4.850
L366-P-180119_A_5060382_1_r.las	5,773,355,265	5505.901	5.377
L367-P-180119_A_5060382_1_r.las	5,658,430,931	5396.300	5.270
L368-P-180119_A_5060382_1_r.las	6,283,065,891	5991.999	5.852
L369-P-180119_A_5060314_1_r.las	6,893,787,625	6574.428	6.420

DPH-9 Report on Swath Size and Segmentation (Swath Data) - continued

File	File Size (bytes)	MB	GB
L370-P-180119_A_5060314_1_r.las	7,060,592,439	6733.506	6.576
L371-P-180119_A_5060314_1_r.las	6,792,260,657	6477.605	6.326
L372-P-180119_A_5060314_1_r.las	637,028,347	607.518	0.593
L372-P-180122_A_5060314_2_r.las	7,439,687,117	7095.039	6.929
L373-P-180120_A_5060314_1_r.las	7,849,715,405	7486.072	7.311
L374-P-180120_A_5060314_1_r.las	6,536,397,655	6233.595	6.087
L374-P-180120_A_5060314_2_r.las	8,472,397,289	8079.908	7.891
L375-P-180120_A_5060314_1_r.las	7,804,221,555	7442.686	7.268
L376-P-180120_A_5060314_1_r.las	7,855,028,165	7491.139	7.316
L377-P-180120_A_5060314_1_r.las	7,915,230,011	7548.552	7.372
L378-P-180122_A_5060314_1_r.las	7,361,044,301	7020.039	6.856
L379-P-180122_A_5060314_1_r.las	7,746,430,431	7387.572	7.214
L380-P-180120_A_5060382_1_r.las	6,929,887,607	6608.856	6.454
L381-P-180120_A_5060382_1_r.las	8,733,262,999	8328.689	8.133
L382-P-180120_A_5060382_1_r.las	6,665,691,753	6356.899	6.208
L383-P-180120_A_5060382_1_r.las	8,801,340,919	8393.613	8.197
L384-P-180122_A_5060314_1_r.las	6,861,831,653	6543.953	6.391
L385-P-180122_A_5060314_1_r.las	6,864,776,847	6546.761	6.393
L386-P-180122_A_5060314_1_r.las	7,077,840,947	6749.955	6.592
L387-P-180123_A_5060314_1_r.las	6,762,143,591	6448.883	6.298
L388-P-180123_A_5060314_1_r.las	7,125,062,699	6794.989	6.636
L389-P-180123_A_5060314_1_r.las	6,945,987,005	6624.209	6.469
L390-P-180123_A_5060314_1_r.las	6,960,862,373	6638.396	6.483
L391-P-180123_A_5060314_1_r.las	6,936,070,451	6614.752	6.460

DPH-9 Report on Swath Size and Segmentation (Swath Data) - continued

File	File Size (bytes)	MB	GB
L392-P-180123_A_5060314_1_r.las	6,943,364,647	6621.709	6.467
L393-P-180123_A_5060314_1_r.las	7,219,104,207	6884.674	6.723
L394-P-180123_A_5060382_1_r.las	6,953,233,045	6631.120	6.476
L395-P-180123_A_5060382_1_r.las	7,297,068,657	6959.027	6.796
L396-P-180123_A_5060382_1_r.las	6,825,692,871	6509.488	6.357
L397-P-180123_A_5060382_1_r.las	7,425,811,511	7081.806	6.916
L398-P-180123_A_5060382_1_r.las	6,762,322,785	6449.054	6.298
L399-P-180123_B_5060382_1_r.las	6,765,448,665	6452.035	6.301
L400-P-180123_B_5060382_1_r.las	7,482,247,425	7135.627	6.968
L401-P-180123_B_5060382_1_r.las	6,949,381,285	6627.446	6.472
L402-P-180123_B_5060382_1_r.las	7,348,819,111	7008.380	6.844
L403-P-180123_B_5060382_1_r.las	7,074,239,907	6746.521	6.588
L404-P-180123_B_5060314_1_r.las	7,344,902,333	7004.645	6.840
L405-P-180123_B_5060314_1_r.las	7,011,899,117	6687.068	6.530
L406-P-180123_B_5060314_1_r.las	7,729,435,707	7371.364	7.199
L407-P-180123_B_5060314_1_r.las	7,300,391,207	6962.196	6.799
L408-P-180123_B_5060314_1_r.las	7,340,712,029	7000.649	6.837
L409-P-180123_B_5060314_1_r.las	7,185,565,003	6852.689	6.692
L410-P-180123_B_5060314_1_r.las	7,378,060,141	7036.266	6.871
L411-P-180127_A_5060314_1_r_P.las	7,430,312,279	7086.098	6.920
L412-P-180127_A_5060314_1_r_P.las	7,409,413,021	7066.167	6.901
L413-P-180127_A_5060314_1_r_P.las	7,978,657,973	7609.041	7.431
L414-P-180127_A_5060314_1_r_P.las	7,198,283,217	6864.818	6.704
L415-P-180127_A_5060314_1_r_P.las	7,844,007,823	7480.629	7.305

DPH-9 Report on Swath Size and Segmentation (Swath Data) - continued

File	File Size (bytes)	MB	GB
L416-P-180127_A_5060314_1_r_P.las	7,272,623,639	6935.714	6.773
L417-P-180127_A_5060382_1_r_P.las	8,230,360,089	7849.083	7.665
L418-P-180127_A_5060382_1_r_P.las	7,154,151,649	6822.731	6.663
L419-P-180127_A_5060382_1_r_P.las	7,890,926,061	7525.374	7.349
L420-P-180127_A_5060382_1_r_P.las	7,119,132,319	6789.334	6.630
L421-P-180127_A_5060382_1_r_P.las	7,402,464,645	7059.540	6.894
L422-P-180127_A_5060382_1_r_P.las	6,903,307,799	6583.507	6.429
L423-P-180127_A_5060382_1_r_P.las	6,884,378,375	6565.455	6.412
L424-P-180127_A_5060382_1_r_P.las	6,358,576,539	6064.011	5.922
L425-P-180127_A_5060382_1_r_P.las	6,591,524,437	6286.168	6.139
L426-P-180127_A_5060382_1_r_P.las	6,121,983,279	5838.378	5.702
L427-P-180127_A_5060382_1_r_P.las	6,481,251,353	6181.003	6.036
L428-P-180127_A_5060382_1_r_P.las	6,189,304,567	5902.581	5.764
L429-P-180127_A_5060382_1_r_P.las	6,682,900,117	6373.310	6.224
L430-P-180127_A_5060314_1_r_P.las	7,597,001,651	7245.065	7.075
L431-P-180127_A_5060314_1_r_P.las	7,804,881,315	7443.315	7.269
L432-P-180127_B_5060314_1_r_P.las	7,972,856,141	7603.508	7.425
L433-P-180127_B_5060314_1_r_P.las	8,631,954,379	8232.073	8.039
L434-P-180127_B_5060314_1_r_P.las	8,118,699,091	7742.595	7.561
L435-P-180127_B_5060314_1_r_P.las	8,778,320,691	8371.659	8.175
L436-P-180127_B_5060314_1_r_P.las	8,251,815,779	7869.545	7.685
L437-P-180127_B_5060314_1_r_P.las	9,050,271,493	8631.011	8.429
L438-P-180127_B_5060314_1_r_P.las	8,598,674,603	8200.335	8.008
L439-P-180128_A_5060314_1_r_P.las	9,296,657,353	8865.983	8.658

DPH-9 Report on Swath Size and Segmentation (Swath Data) - continued

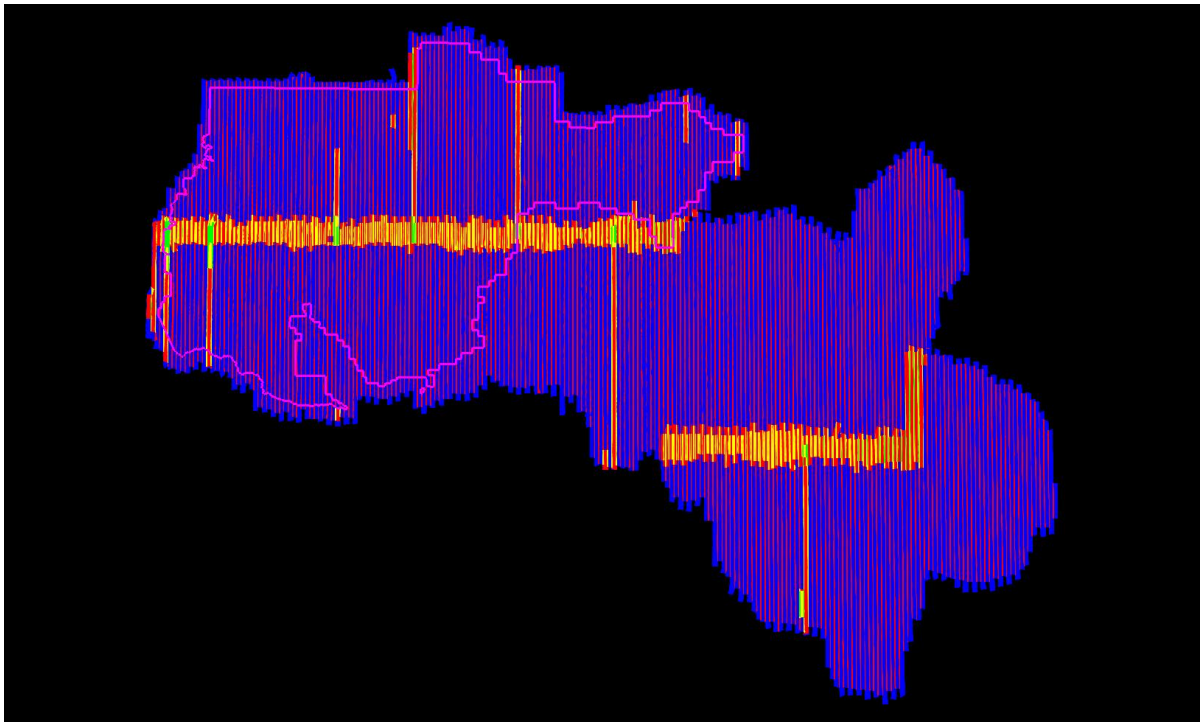
File	File Size (bytes)	MB	GB
L440-P-180128_A_5060314_1_r_P.las	8,869,717,189	8458.821	8.261
L441-P-180128_A_5060314_1_r_P.las	10,063,839,111	9597.625	9.373
L442-P-180128_A_5060314_1_r_P.las	9,250,178,529	8821.658	8.615
L443-P-180128_A_5060314_1_r_P.las	10,426,850,141	9943.819	9.711
L444-P-180128_A_5060314_1_r_P.las	9,376,481,657	8942.110	8.733
L445-P-180128_A_5060314_1_r_P.las	10,070,379,011	9603.862	9.379
L446-P-180128_A_5060314_1_r_P.las	6,407,042,625	6110.232	5.967
L447-P-180128_A_5060382_1_r_P.las	6,311,622,589	6019.232	5.878
L448-P-180128_A_5060382_1_r_P.las	5,276,497,875	5032.061	4.914
L449-P-180128_A_5060382_1_r_P.las	5,355,063,883	5106.987	4.987
L450-P-180128_A_5060382_1_r_P.las	3,750,040,345	3576.317	3.492
L451-P-180128_A_5060382_1_r_P.las	3,512,207,461	3349.502	3.271
L452-P-180128_A_5060382_1_r_P.las	4,068,018,613	3879.565	3.789
L453-P-180128_A_5060382_1_r_P.las	3,091,302,347	2948.096	2.879
L454-P-180128_A_5060382_1_r_P.las	3,110,562,291	2966.463	2.897
L455-P-180128_A_5060382_1_r_P.las	2,337,633,079	2229.341	2.177
L461-P-180128_A_5060382_1_r_P.las	1,263,955,839	1205.402	1.177

DPH-10 Report on Scope of Collection

The USGS Lidar Base Specification Version 1.2 states: "All collected swaths shall be delivered as part of the Raw Data Deliverable, including, calibration swaths and cross-ties. All collected returns within each swath shall also be delivered. No points are to be deleted from the swath LAS files. Exceptions to this rule are the extraneous data outside of the BPA (such as aircraft turns, transit between the collection area and airport, and transit between fill-in areas)."

The purpose of this section is to show collection scan overlap. Lack of overlap would be displayed as black polygons or slivers between collection scans.

Data Source - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\LiDAR\01_Boresight\Rio_Grande\LAS
Result Path - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Admin\QA_QC\04_17_2018_Middle_Rio_Grande_East\DPH_10\Flightline_Coverage_Overlap.jp2



Purple polygon is buffered project area (BPA) boundary

Single Double Triple Quadruple coverage or more

DPH-11.1.1 Report on Smooth Surface Repeatability (intraswath)

The USGS Lidar Base Specification Version 1.2 states: "In ideal theoretical conditions, smooth surface repeatability is a measure of variations documented on a surface that would be expected to be flat and without variation. Users of lidar technology commonly refer to these variations as "noise." Single-swath data will be assessed using only single returns in nonvegetated areas. Repeatability will be evaluated by measuring departures from planarity of single returns from hard planar surfaces, normalizing for actual variation in the surface elevation. Repeatability of only single returns will then be assessed at multiple locations within hard surfaced areas (for example, parking lots or large rooftops). Each sample area will be evaluated using a signed difference raster (maximum elevation - minimum elevation) at a cell size equal to twice the ANPS, rounded up to the next integer. Sample areas will be approximately 50 square meters. The maximum acceptable variations within sample areas at each QL are listed in the table "Relative vertical accuracy for lidar-swath data, Quality Level 0–Quality Level 3" (table 2). Isolated noise is expected within the sample areas and will be disregarded."

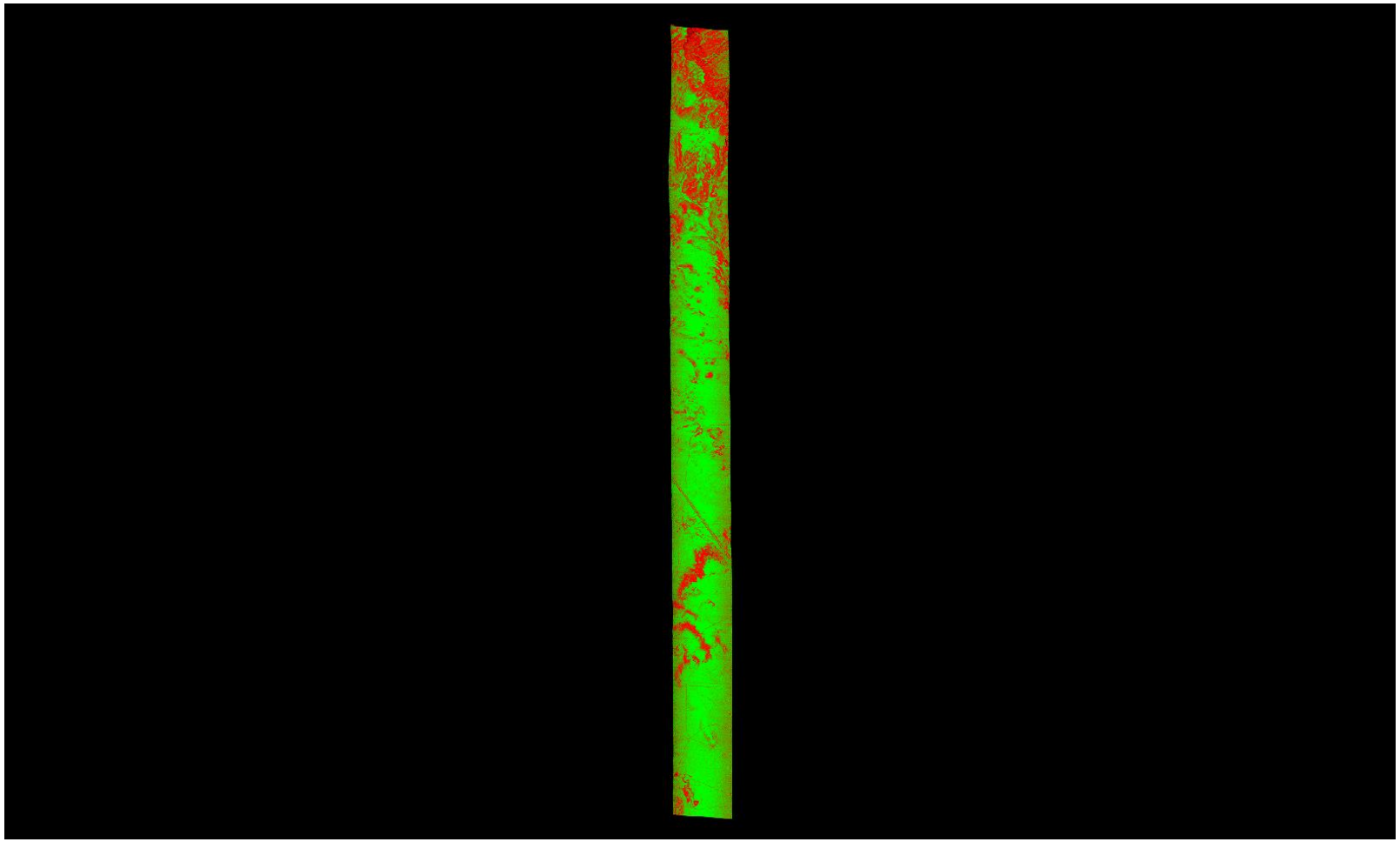
Table 2. Relative vertical accuracy for lidar-swath data, Quality Level 0–Quality Level 3.
[cm, centimeter]

Quality Level (QL)	Smooth surface repeatability (cm)
QL0	≤3
QL1	≤6
QL2	≤6
QL3	≤12

The purpose of this section is to evaluate smooth surface repeatability by measuring departures from planarity of single returns from hard planar surfaces, normalizing for actual variation in the surface elevation. Repeatability of only single returns is then assessed at multiple locations within hard surfaced areas (for example, parking lots or large rooftops).

DPH-11.1.1 Report on Smooth Surface Repeatability (intraswath) - continued

Data Source - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\LiDAR\01_Boresight\Rio_Grande\LAS
Y:\Mapping\Projects\65219750_NM_NRCS_Central\Admin\QA_QC\04_17_2018_Middle_Rio_Grande_East\DPH_11_1_1\Individual_L169-P-180129_A_5060382_1_r_P_GRID.jp2



0	0.060	0.600 (Meter)
0	0.197	1.969 (Feet)

A maximum vertical separation cutoff has been applied to this graphic for the purpose of masking out disruptive features that do not show calibration issues between flight lines (e.g., trees, moving cars, etc.).

DPH-11.1.2.1 Report on Overlap Consistency (interswath)

The USGS Lidar Base Specification Version 1.2 states: "Overlap consistency is a measure of geometric alignment of two overlapping swaths; the principles used with swaths can be applied to overlapping lifts and projects as well. Overlap consistency is the fundamental measure of the quality of the calibration or boresight adjustment of the data from each lift, and is of particular importance as the match between the swaths of a single lift is a strong indicator of the overall geometric quality of the data, establishing the quality and accuracy limits of all downstream data and products.
Overlap consistency will be assessed at multiple locations within overlap in nonvegetated areas of only single returns. The overlap areas that will be tested are those between the following:
(1) Adjacent, overlapping parallel swaths within a project,
(2) Cross-tie swaths and the intersecting project swaths, and
(3) Adjacent, overlapping lifts.
Each overlap area will be evaluated using a signed difference raster with a cell size equal to twice the ANPS, rounded up to the next integer. The difference rasters will be visually examined using a bicolor ramp from the negative acceptable limit to the positive acceptable limit. Although isolated excursions beyond the limits are expected and accepted, differences in the overlaps shall not exceed the limits listed in table 2 for the QL of information that is being collected. The difference rasters will be statistically summarized to verify that root mean square difference in z (RMSDz) values do not exceed the limits set forth in the table "Relative vertical accuracy for lidar-swath data, Quality Level 0–Quality Level 3" (table 2) for the QL of information that is being collected. Consideration will be given for the effect of the expected isolated excursions over limits."

Table 2. Relative vertical accuracy for lidar-swath data, Quality Level 0–Quality Level 3.

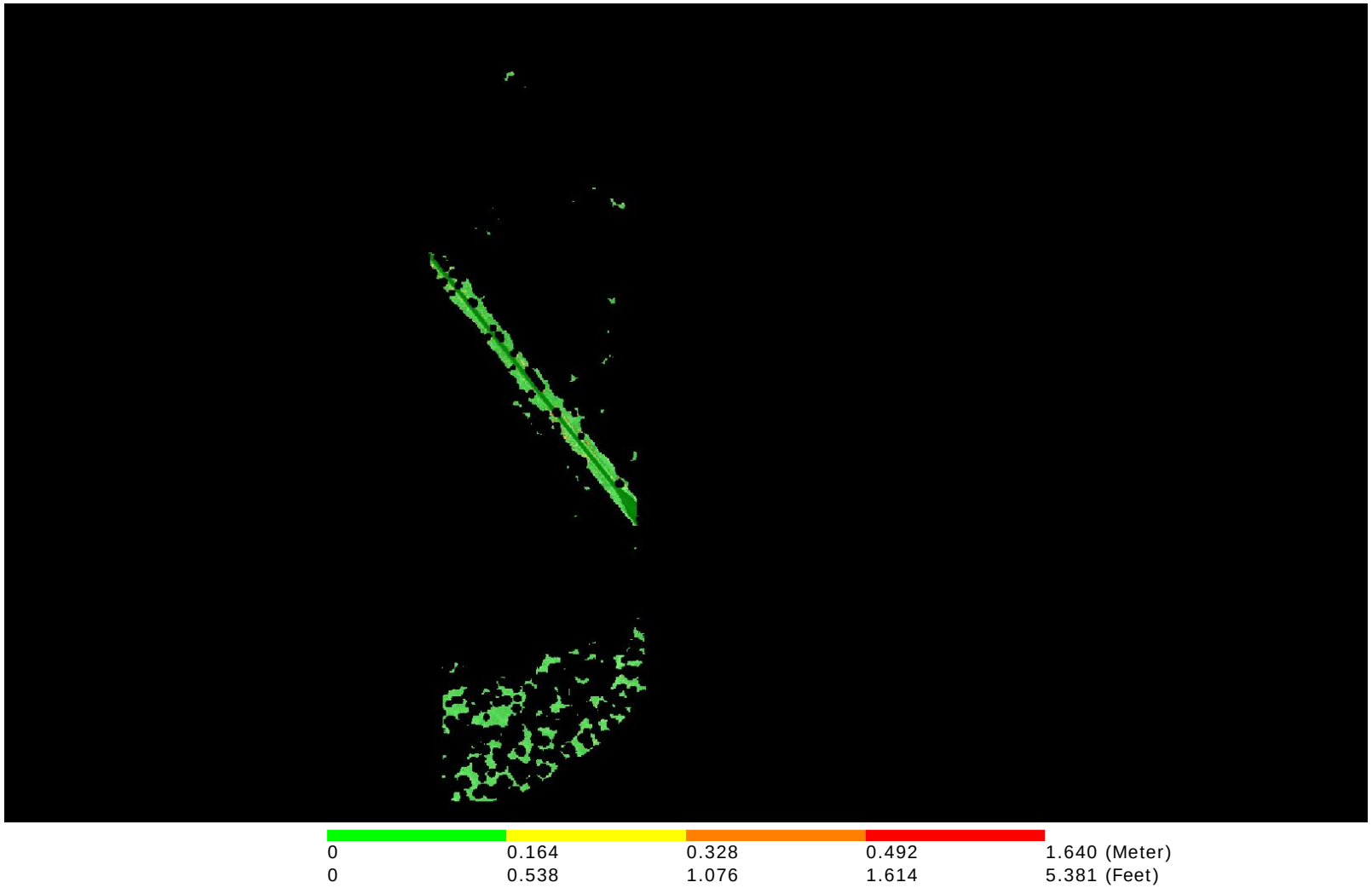
[cm, centimeter; $RMSD_z$, root mean square difference in z; ≤, less than or equal to; ±, plus or minus]

Quality Level (QL)	Swath overlap difference, $RMSD_z$ (cm)	Swath overlap difference, maximum (cm)
QL0	≤4	±8
QL1	≤8	±16
QL2	≤8	±16
QL3	≤16	±32

The purpose of this section is to show a graphic of the flight line separation raster for all of the data processed. This grid/image shows the vertical separation of flight lines by thematically coloring the separation magnitude on a color ramp based on absolute distance. This color thematic rendering is modulated by intensity to show land cover features. If there is no flight line overlap, the raster is displayed as grayscale intensity alone.

DPH-11.1.2.1 Report on Overlap Consistency (interswath) - continued

Data Source - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\LiDAR\01_Boresight\Rio_Grande\LAS
Y:\Mapping\Projects\65219750_NM_NRCS_Central\Admin\QA_QC\04_17_2018_Middle_Rio_Grande_East\DPH_11_1_2\Area1\Boresighted_FlightlineSeparation_SingleFile_Measurable_GRID.jp2



A maximum vertical separation cutoff has been applied to this graphic for the purpose of masking out disruptive features that do not show calibration issues between flight lines (e.g., trees, moving cars, etc.).

DPH-11.1.2.2 Report on Overlap Consistency (interswath)

The USGS Lidar Base Specification Version 1.2 states: "Overlap consistency is a measure of geometric alignment of two overlapping swaths; the principles used with swaths can be applied to overlapping lifts and projects as well. Overlap consistency is the fundamental measure of the quality of the calibration or boresight adjustment of the data from each lift, and is of particular importance as the match between the swaths of a single lift is a strong indicator of the overall geometric quality of the data, establishing the quality and accuracy limits of all downstream data and products.
Overlap consistency will be assessed at multiple locations within overlap in nonvegetated areas of only single returns. The overlap areas that will be tested are those between the following:
(1) Adjacent, overlapping parallel swaths within a project,
(2) Cross-tie swaths and the intersecting project swaths, and
(3) Adjacent, overlapping lifts.
Each overlap area will be evaluated using a signed difference raster with a cell size equal to twice the ANPS, rounded up to the next integer. The difference rasters will be visually examined using a bicolor ramp from the negative acceptable limit to the positive acceptable limit. Although isolated excursions beyond the limits are expected and accepted, differences in the overlaps shall not exceed the limits listed in table 2 for the QL of information that is being collected. The difference rasters will be statistically summarized to verify that root mean square difference in z (RMSDz) values do not exceed the limits set forth in the table "Relative vertical accuracy for lidar-swath data, Quality Level 0–Quality Level 3" (table 2) for the QL of information that is being collected. Consideration will be given for the effect of the expected isolated excursions over limits."

Table 2. Relative vertical accuracy for lidar-swath data, Quality Level 0–Quality Level 3.

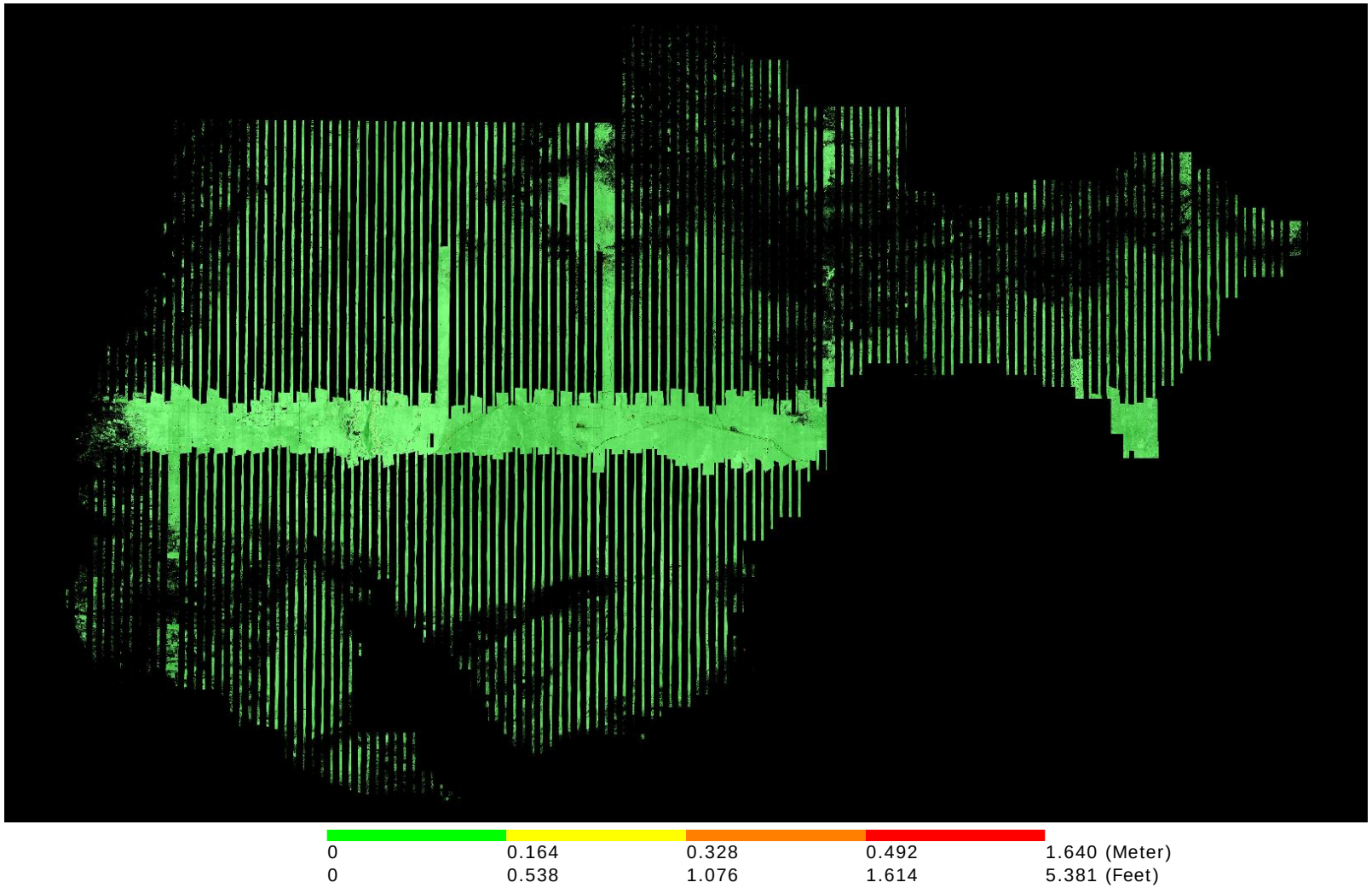
[cm, centimeter; $RMSD_z$, root mean square difference in z; ≤, less than or equal to; ±, plus or minus]

Quality Level (QL)	Swath overlap difference, $RMSD_z$ (cm)	Swath overlap difference, maximum (cm)
QL0	≤4	±8
QL1	≤8	±16
QL2	≤8	±16
QL3	≤16	±32

The purpose of this section is to show a graphic of the flight line separation raster for all of the data processed. This grid/image shows the vertical separation of flight lines by thematically coloring the separation magnitude on a color ramp based on absolute distance. This color thematic rendering is modulated by intensity to show land cover features. If there is no flight line overlap, the raster is displayed as grayscale intensity alone.

DPH-11.1.2.2 Report on Overlap Consistency (interswath) - continued

Data Source - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\LiDAR\01_Boresight\Rio_Grande\LAS
Y:\Mapping\Projects\65219750_NM_NRCS_Central\Admin\QA_QC\04_17_2018_Middle_Rio_Grande_East\DPH_11_1_2\Area2\Boresighted_FlightlineSeparation_SingleFile_Measurable_GRID.jp2



A maximum vertical separation cutoff has been applied to this graphic for the purpose of masking out disruptive features that do not show calibration issues between flight lines (e.g., trees, moving cars, etc.).

DPH-11.2 Report on Check Points

The USGS Lidar Base Specification Version 1.2 states: "The Positional Accuracy Standards for Digital Geospatial Data (American Society for Photogrammetry and Remote Sensing, 2014) ties the required number of check points for vertical accuracy assessment to the areal extent of the project. Data producers are encouraged to carefully review the new and revised requirements in that document. Check points for NVA assessments shall be surveyed in clear, open areas (which typically produce only single lidar returns), devoid of vegetation and other vertical artifacts (such as boulders, large riser pipes, and vehicles). Ground that has been plowed or otherwise disturbed is not acceptable. The same check points may be used for NVA assessment of the point cloud and DEM. Check points for VVA assessments shall be surveyed in vegetated areas (typically characterized by multiple return lidar). Although the nature of vegetated areas makes absolute definition of a suitable test area difficult, these areas will meet the requirements below. As stated in the National Standards for Spatial Data Accuracy (NSSDA) (Federal Geographic Data Committee, 1998) and reiterated in the ASPRS Positional Accuracy Standards for Digital Geospatial Data (American Society for Photogrammetry and Remote Sensing, 2014), it is unrealistic to prescribe detailed requirements for check point locations, as many unpredictable factors will affect field operations and decisions, and the data producer must often have the freedom to use their best professional judgment. The quantity and location of check points shall meet the following requirements, unless alternative criteria are approved by the USGS–NGP in advance:

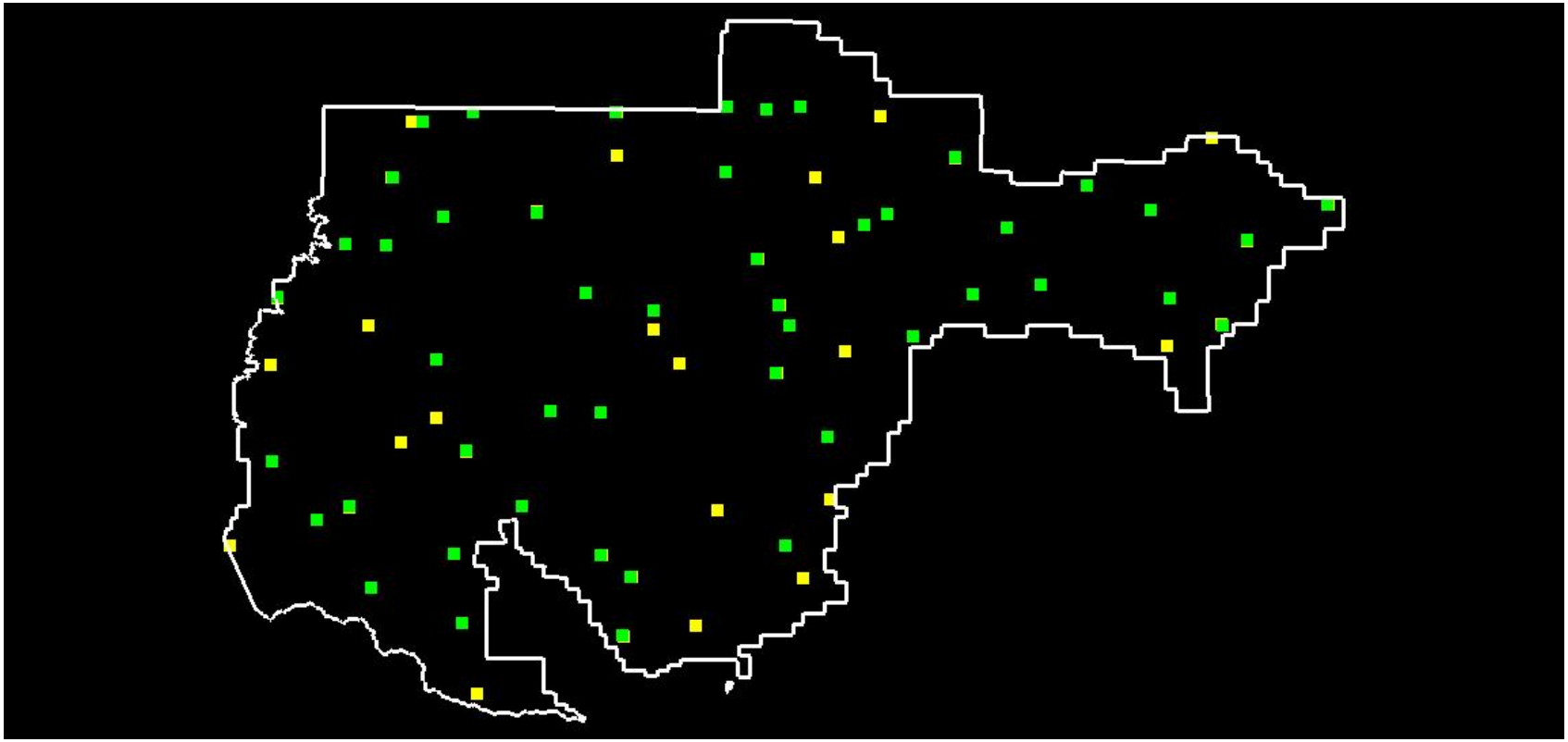
- The ASPRS-recommended total number of check points for a given project size shall be met.
- The ASPRS-recommended distribution of the total number of check points between NVA and VVA assessments shall be met.
- Check points within each assessment type (NVA and VVA) will be well-distributed across the entire project area. See the glossary at the end of this specification for a definition of "well-distributed."
- Within each assessment type, check points will be distributed among all constituent land cover types in approximate proportion to the areas of those land cover types (American Society for Photogrammetry and Remote Sensing, 2014)."

The purpose of this section is to show check points (NVA and VVA).

DPH-11.2 Report on Check Points - continued

Data Source - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\Final_Client_Deliverables\Block2_MiddleRioGrandeEast\metadata\shapefiles\MiddleRioGrandeEast_64NVA_48VVA_pts.shp

Check Point Path - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Admin\QA_QC\04_17_2018_Middle_Rio_Grande_East\DPH_11_2\CheckPoints.jpg



Yellow points are NVA, green points are VVA.
White polygon is defined project area (DPA) boundary

DPH-11.2 Report on Check Points - continued

Total check points: 112

Check points in defined project area (DPA): 112

Total NVA check points in defined project area (DPA): 64

Total VVA check points in defined project area (DPA): 48

Total defined project area (DPA): 8187.795 square KM

Density of check points in defined project area (DPA): 0.014 points per square KM

TABLE C.1 RECOMMENDED NUMBER OF CHECKPOINTS BASED ON AREA

Project Area (Square Kilometers)	Horizontal Accuracy Testing of Orthoimagery and Planimetrics	Vertical and Horizontal Accuracy Testing of Elevation Data sets		
	Total Number of Static 2D/3D Checkpoints (clearly-defined points)	Number of Static 3D Checkpoints in NVA[9]	Number of Static 3D Checkpoints in VVA	Total Number of Static 3D Checkpoints
≤500	20	20	5	25
501-750	25	20	10	30
751-1000	30	25	15	40
1001-1250	35	30	20	50
1251-1500	40	35	25	60
1501-1750	45	40	30	70
1751-2000	50	45	35	80
2001-2250	55	50	40	90
2251-2500	60	55	45	100

[9]Although vertical check points are normally not well defined, where feasible, the horizontal accuracy of lidar data sets should be tested by surveying approximately half of all NVA check points at the ends of paint stripes or other point features that are visible and can be measured on lidar intensity returns.

Source: ASPRS Positional Accuracy Standards for Digital Geospatial Data (Edition 1, Version 1.0. - November 2014)

DPH-11.3 Report on Absolute Vertical Accuracy

The USGS Lidar Base Specification Version 1.2 states: "Absolute vertical accuracy of the lidar data and the derived DEM will be assessed and reported in accordance with the ASPRS Positional Accuracy Standards for Digital Geospatial Data (American Society for Photogrammetry and Remote Sensing, 2014). Two broad land cover types shall be assessed: vegetated and nonvegetated. Three absolute accuracy values shall be assessed and reported: NVA for the point cloud, NVA for the DEM, and VVA for the DEM. The minimum NVA and VVA requirements for all data, using the ASPRS methodology, are listed in the tables 'Absolute vertical accuracy for lidar-swath data, Quality Level 0–Quality Level 3' (table 4) and 'Absolute vertical accuracy for digital elevation models, Quality Level 0–Quality Level 3' (table 5). Both the NVA and VVA required values shall be met. For projects dominated by dense forests, the USGS–NGP may accept higher VVA values."

Table 4. Absolute vertical accuracy for lidar-swath data, Quality Level 0–Quality Level 3.

[$RMSE_z$, root mean square error in z; cm, centimeter; NVA, nonvegetated vertical accuracy; ≤, less than or equal to]

Quality Level (QL)	$RMSE_z$ (nonvegetated) (cm)	NVA at 95-percent confidence level (cm)
QL0	≤5.0	≤9.8
QL1	≤10.0	≤19.6
QL2	≤10.0	≤19.6
QL3	≤20.0	≤39.2

Table 5. Absolute vertical accuracy for digital elevation models, Quality Level 0–Quality Level 3.

[$RMSE_z$, root mean square error in z; cm, centimeter; NVA, nonvegetated vertical accuracy; VVA, vegetated vertical accuracy; ≤, less than or equal to]

Quality Level (QL)	$RMSE_z$ (nonvegetated) (cm)	NVA at 95-percent confidence level (cm)	VVA at 95th percentile (cm)
QL0	≤5.0	≤9.8	≤14.7
QL1	≤10.0	≤19.6	≤29.4
QL2	≤10.0	≤19.6	≤29.4
QL3	≤20.0	≤39.2	≤58.8

The purpose of this section is to report on the absolute vertical accuracy of the lidar data by testing for NVA (Nonvegetated Vertical Accuracy) and VVA (Vegetated Vertical Accuracy) against surveyed ground check points.

DPH-11.3 Report on Absolute Vertical Accuracy - continued

Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\Final_Client_Deliverables\Block2_MiddleRioGrandeEast\metadata\shapefiles\MiddleRioGrandeEast_64NVA_48VVA_pts.shp

Units: Meter (/Feet)

Vertical Accuracy Class tested: 10-cm

Check Points in defined project area (DPA):	112
Check Points with Lidar Coverage	112
Check Points with Lidar Coverage (NVA)	64
Check Points with Lidar Coverage (VVA)	48
Average Z Error (NVA)	-0.031/-0.101
Maximum Z Error (NVA)	0.055/0.181
Median Z Error (NVA)	-0.026/-0.085
Minimum Z Error (NVA)	-0.109/-0.358
Standard deviation of Vertical Error (NVA)	0.039/0.128
Skewness of Vertical Error (NVA)	0.095
Kurtosis of Vertical Error (NVA)	-0.348
Non-vegetated Vertical Accuracy (NVA) RMSE(z) [1]	0.049/0.162 PASS
Non-vegetated Vertical Accuracy (NVA) at the 95% Confidence Level +/- [1]	0.097/0.318 PASS
FGDC/NSSDA Vertical Accuracy at the 95% Confidence Level +/-	0.097/0.318
Non-vegetated Vertical Accuracy (NVA) RMSE(z) (DEM) [2]	0.052/0.170 PASS
Non-vegetated Vertical Accuracy (NVA) at the 95% Confidence Level (DEM) +/- [2]	0.101/0.333 PASS
Vegetated Vertical Accuracy (VVA) at the 95th Percentile (DEM) +/- [2]	0.137/0.449 PASS

This data set was tested to meet ASPRS Positional Accuracy Standard for Digital Geospatial Data (2014) for a 10-cm RMSEz Vertical Accuracy Class. Actual NVA accuracy was found to be RMSEz = 4.947cm, equating to +/- 9.696cm at the 95% confidence level. Actual VVA accuracy was found to be +/- 13.680cm at the 95th percentile.

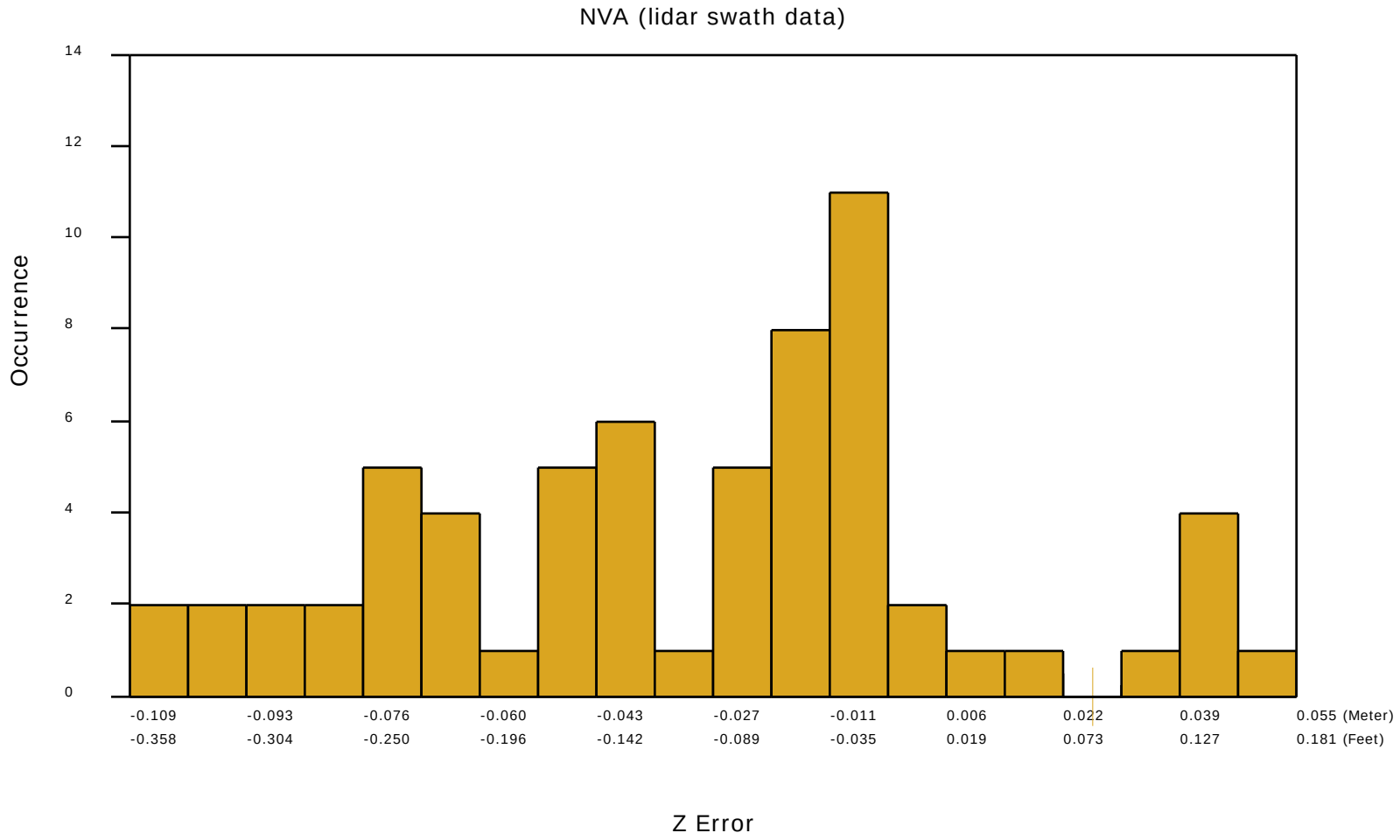
[1] This value is calculated from TIN-based testing of the raw swath lidar point cloud data.

[2] This value is calculated from RAM-based grid testing of the classified tiled lidar data. The grid cells are sized according to the Quality Level selected, and are defined in the USGS NGP Lidar Base Specification Version 1.2 (page 15, Table 7).

DPH-11.3 Report on Absolute Vertical Accuracy - continued

The purpose of this section is to show a frequency distribution chart of the non-vegetated vertical accuracy (NVA) of the lidar point cloud data measured against surveyed ground check points.

Data Source - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\LiDAR\01_Boresight\Rio_Grande\LAS

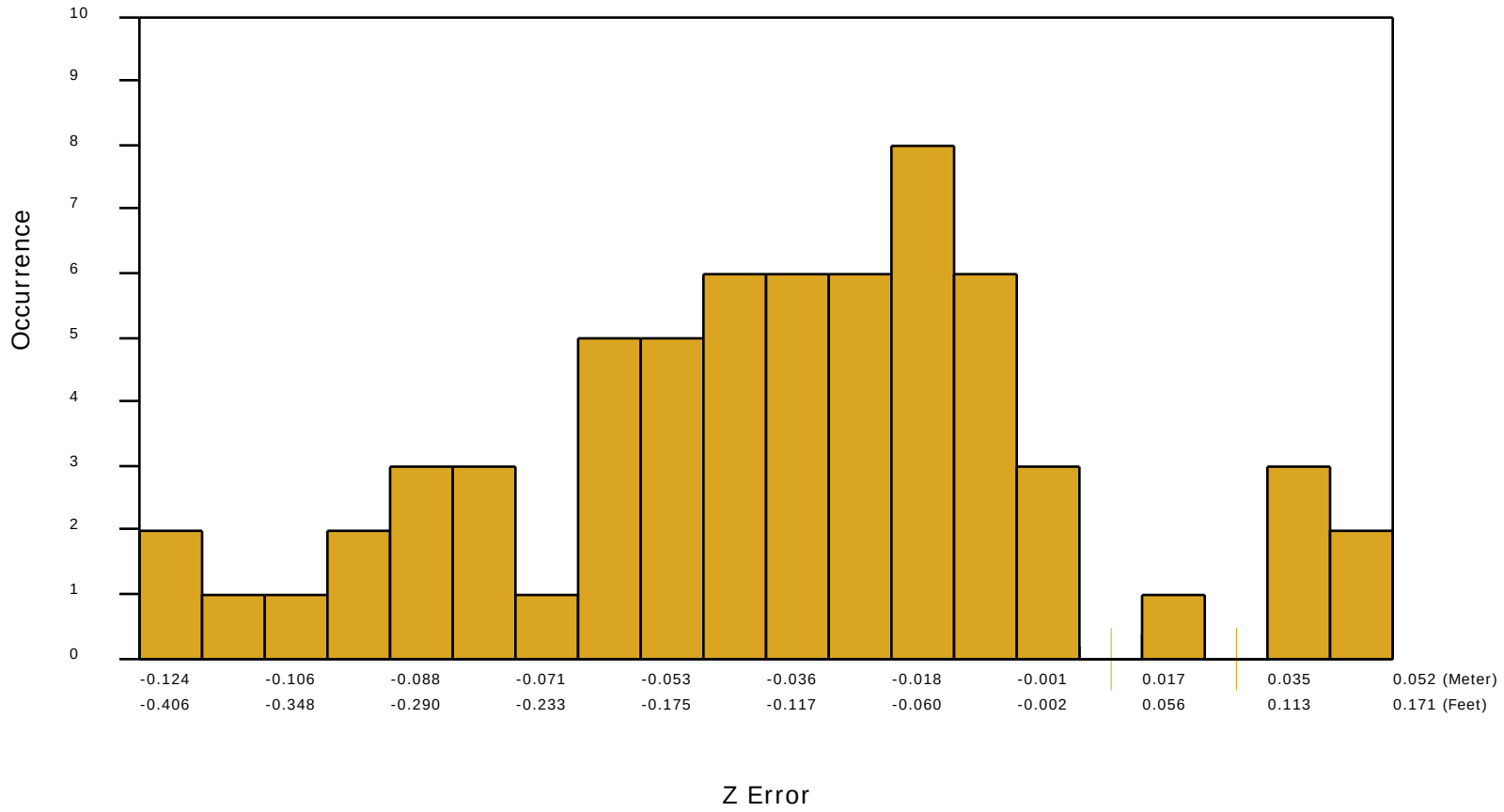


DPH-11.3 Report on Absolute Vertical Accuracy - continued

The purpose of this section is to show a frequency distribution chart of the non-vegetated vertical accuracy (NVA) of the DEM data measured against surveyed ground check points.

Data Source - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\Final_Client_Deliverables\Block2_MiddleRioGrandeEast\point_cloud\tilecls

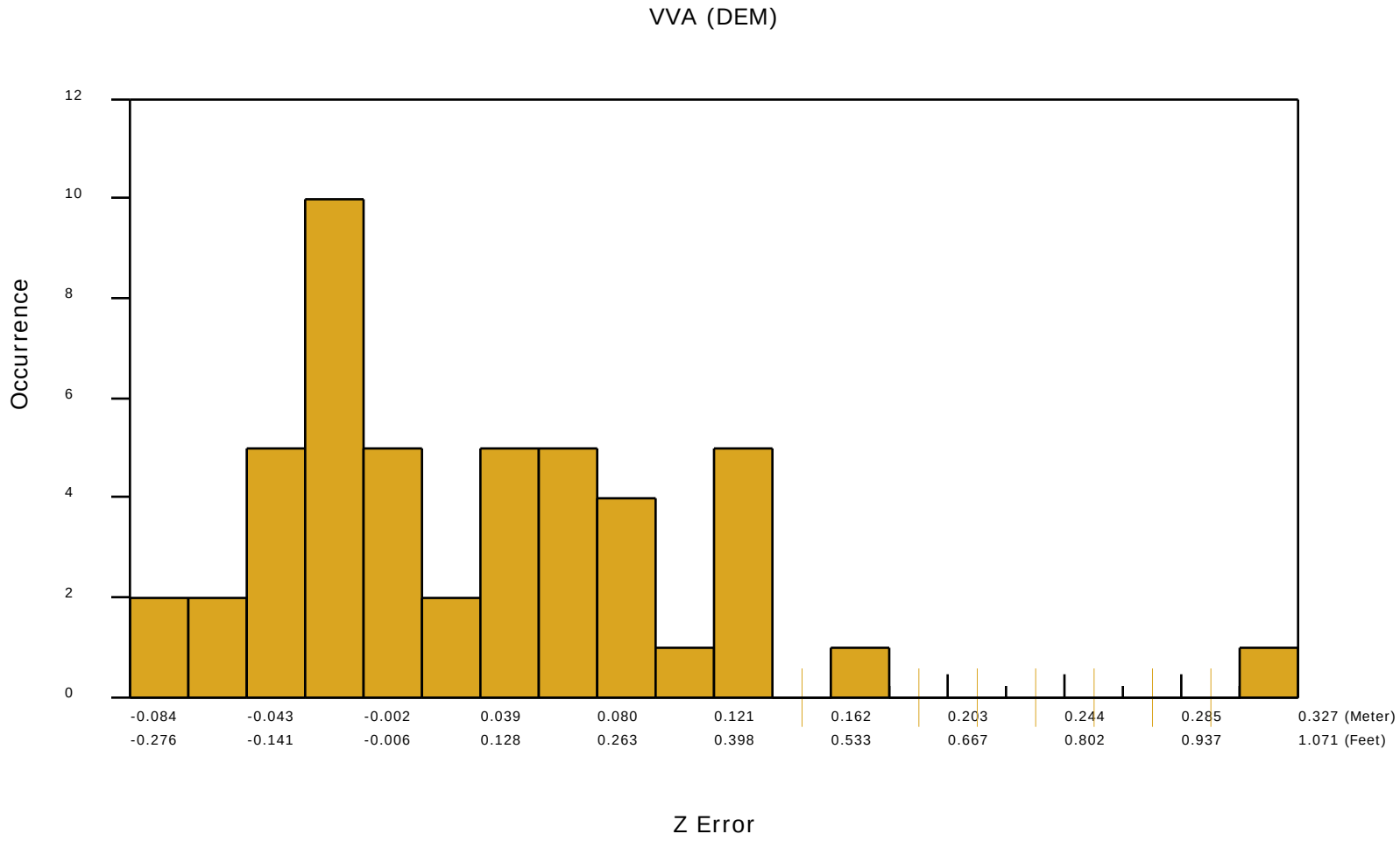
NVA (DEM)



DPH-11.3 Report on Absolute Vertical Accuracy - continued

The purpose of this section is to show a frequency distribution chart of the vegetated vertical accuracy (VVA) of the DEM data measured against surveyed ground check points.

Data Source - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\Final_Client_Deliverables\Block2_MiddleRioGrandeEast\point_cloud\tilecls



DPH-12 Report on Use of the LAS Withheld Flag (Swath Data)

The USGS Lidar Base Specification Version 1.2 states: "Outliers, blunders, noise points, geometrically unreliable points near the extreme edge of the swath, and other points the data producer deems unusable are to be identified using the Withheld Flag, as defined in the LAS Specification version 1.4 (American Society for Photogrammetry and Remote Sensing, 2011). The Withheld Flag is primarily used to denote points identified during preprocessing or through automated post-processing routines as geometrically unusable. Noise points subsequently identified during manual classification and quality assurance/quality control (QA/QC) are typically assigned the appropriate standard LAS classification values for noise–Class 7 is used for Low Noise and Class 18 is used for High Noise."

The purpose of this section is to list the presence and quantities of points flagged as Withheld for all lidar swath data files.

Boresighted Files - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\LiDAR\01_Boresight\Rio_Grande\LAS

Total Withheld points (all classes, all swaths)	86047702

DPH-12 Report on Use of the LAS Withheld Flag (Tiled Data)

The purpose of this section is to list the presence and quantities of points flagged as Withheld for all lidar tiled data files.

Classified Files - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\Final_Client_Deliverables\Block2_MiddleRioGrandeEast\point_cloud\tilecls

Total Withheld points (all classes, all tiles)	24172655

DPH-13 Report on Use of the LAS Overlap Flag (Swath Data)

The USGS Lidar Base Specification Version 1.2 states: "The LAS Specification version 1.4 (American Society for Photogrammetry and Remote Sensing, 2011) includes a new overlap flag. Although strictly speaking, the term "overlap" means all lidar points lying within any overlapping areas of two or more swaths, the flag is intended to identify overage points, which are only a subset of overlap points. See the glossary for more information on the difference between overlap and overage. Having overage points identified allows for their easy exclusion from subsequent processes where the increased density and elevation variability they introduce is unwanted (for example, DEM generation). Overage points have commonly been identified using Class 12, precluding other valuable classification (for example, bare earth, water). The overlap flag provides a discrete method to identify overage points while preserving the ability to classify the points in the normal way. Overage points shall be identified using the LAS overlap flag in all point cloud deliverables."

The purpose of this section is to list the presence and quantities of points flagged as Overlap for all lidar swath data files.

Boresighted Files - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\LiDAR\01_Boresight\Rio_Grande\LAS

Total Overlap points (all classes, all swaths)	0

DPH-13 Report on Use of the LAS Overlap Flag (Tiled Data)

The purpose of this section is to list the presence and quantities of points flagged as Overlap for all lidar tiled data files.

Classified Files - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\Final_Client_Deliverables\Block2_MiddleRioGrandeEast\point_cloud\tilecls

Total Overlap points (all classes, all tiles)	10966560106

DPH-14 Report on Point Classification

The USGS Lidar Base Specification Version 1.2 states: "The minimum scheme required for lidar point clouds is listed in the table 'Minimum classified pointcloud classification scheme' (table 6). All points not identified as Withheld (WH) shall be classified. "

Table 6. Minimum classified point cloud classification scheme.

Code	Description
1	Processed, but unclassified.
2	Bare earth.
7	Low noise.
9	Water.
10	Ignored ground (near a breakline).
17	Bridge decks.
18	High noise.

The purpose of this section is to report total numbers of points for each class within the tile based LAS files.

DPH-14 Report on Point Classification - Class Totals

The purpose of this section is to list the number of points in each classification so that the user can determine if any points exist in unintended classes.

Classified Files - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\Final_Client_Deliverables\Block2_MiddleRioGrandeEast\point_cloud\tilecls

Class	Total	MKP	WH	Class	Total	MKP	WH	Class	Total	MKP	WH	Class	Total	MKP	WH
0	00	00	00	64	00	00	00	128	00	00	00	192	00	00	00
1	2,668,266,199	00	24,172,655	65	00	00	00	129	00	00	00	193	00	00	00
2	27,581,316,534	00	00	66	00	00	00	130	00	00	00	194	00	00	00
3	00	00	00	67	00	00	00	131	00	00	00	195	00	00	00
4	00	00	00	68	00	00	00	132	00	00	00	196	00	00	00
5	00	00	00	69	00	00	00	133	00	00	00	197	00	00	00
6	00	00	00	70	00	00	00	134	00	00	00	198	00	00	00
7	601	00	00	71	00	00	00	135	00	00	00	199	00	00	00
8	00	00	00	72	00	00	00	136	00	00	00	200	00	00	00
9	1,118,171	00	00	73	00	00	00	137	00	00	00	201	00	00	00
10	55,501	00	00	74	00	00	00	138	00	00	00	202	00	00	00
11	00	00	00	75	00	00	00	139	00	00	00	203	00	00	00
12	00	00	00	76	00	00	00	140	00	00	00	204	00	00	00
13	00	00	00	77	00	00	00	141	00	00	00	205	00	00	00
14	00	00	00	78	00	00	00	142	00	00	00	206	00	00	00
15	00	00	00	79	00	00	00	143	00	00	00	207	00	00	00
16	00	00	00	80	00	00	00	144	00	00	00	208	00	00	00
17	93,285	00	00	81	00	00	00	145	00	00	00	209	00	00	00
18	586	00	00	82	00	00	00	146	00	00	00	210	00	00	00
19	00	00	00	83	00	00	00	147	00	00	00	211	00	00	00
20	00	00	00	84	00	00	00	148	00	00	00	212	00	00	00
21	00	00	00	85	00	00	00	149	00	00	00	213	00	00	00
22	00	00	00	86	00	00	00	150	00	00	00	214	00	00	00
23	00	00	00	87	00	00	00	151	00	00	00	215	00	00	00
24	00	00	00	88	00	00	00	152	00	00	00	216	00	00	00
25	00	00	00	89	00	00	00	153	00	00	00	217	00	00	00
26	00	00	00	90	00	00	00	154	00	00	00	218	00	00	00
27	00	00	00	91	00	00	00	155	00	00	00	219	00	00	00
28	00	00	00	92	00	00	00	156	00	00	00	220	00	00	00
29	00	00	00	93	00	00	00	157	00	00	00	221	00	00	00
30	00	00	00	94	00	00	00	158	00	00	00	222	00	00	00
31	00	00	00	95	00	00	00	159	00	00	00	223	00	00	00
32	00	00	00	96	00	00	00	160	00	00	00	224	00	00	00
33	00	00	00	97	00	00	00	161	00	00	00	225	00	00	00
34	00	00	00	98	00	00	00	162	00	00	00	226	00	00	00
35	00	00	00	99	00	00	00	163	00	00	00	227	00	00	00
36	00	00	00	100	00	00	00	164	00	00	00	228	00	00	00
37	00	00	00	101	00	00	00	165	00	00	00	229	00	00	00
38	00	00	00	102	00	00	00	166	00	00	00	230	00	00	00
39	00	00	00	103	00	00	00	167	00	00	00	231	00	00	00
40	00	00	00	104	00	00	00	168	00	00	00	232	00	00	00
41	00	00	00	105	00	00	00	169	00	00	00	233	00	00	00
42	00	00	00	106	00	00	00	170	00	00	00	234	00	00	00
43	00	00	00	107	00	00	00	171	00	00	00	235	00	00	00
44	00	00	00	108	00	00	00	172	00	00	00	236	00	00	00
45	00	00	00	109	00	00	00	173	00	00	00	237	00	00	00
46	00	00	00	110	00	00	00	174	00	00	00	238	00	00	00
47	00	00	00	111	00	00	00	175	00	00	00	239	00	00	00
48	00	00	00	112	00	00	00	176	00	00	00	240	00	00	00
49	00	00	00	113	00	00	00	177	00	00	00	241	00	00	00
50	00	00	00	114	00	00	00	178	00	00	00	242	00	00	00
51	00	00	00	115	00	00	00	179	00	00	00	243	00	00	00
52	00	00	00	116	00	00	00	180	00	00	00	244	00	00	00
53	00	00	00	117	00	00	00	181	00	00	00	245	00	00	00
54	00	00	00	118	00	00	00	182	00	00	00	246	00	00	00
55	00	00	00	119	00	00	00	183	00	00	00	247	00	00	00
56	00	00	00	120	00	00	00	184	00	00	00	248	00	00	00
57	00	00	00	121	00	00	00	185	00	00	00	249	00	00	00
58	00	00	00	122	00	00	00	186	00	00	00	250	00	00	00
59	00	00	00	123	00	00	00	187	00	00	00	251	00	00	00
60	00	00	00	124	00	00	00	188	00	00	00	252	00	00	00
61	00	00	00	125	00	00	00	189	00	00	00	253	00	00	00
62	00	00	00	126	00	00	00	190	00	00	00	254	00	00	00
63	00	00	00	127	00	00	00	191	00	00	00	255	00	00	00

Bold – point counts in 'Minimum classified point cloud classification scheme' (see table on previous page)

– point counts in Classes beyond the minimum

– disallowed point counts per USGS spec

– not all Class 0 points flagged as Withheld

DPH-15.1 Report on Classification Accuracy

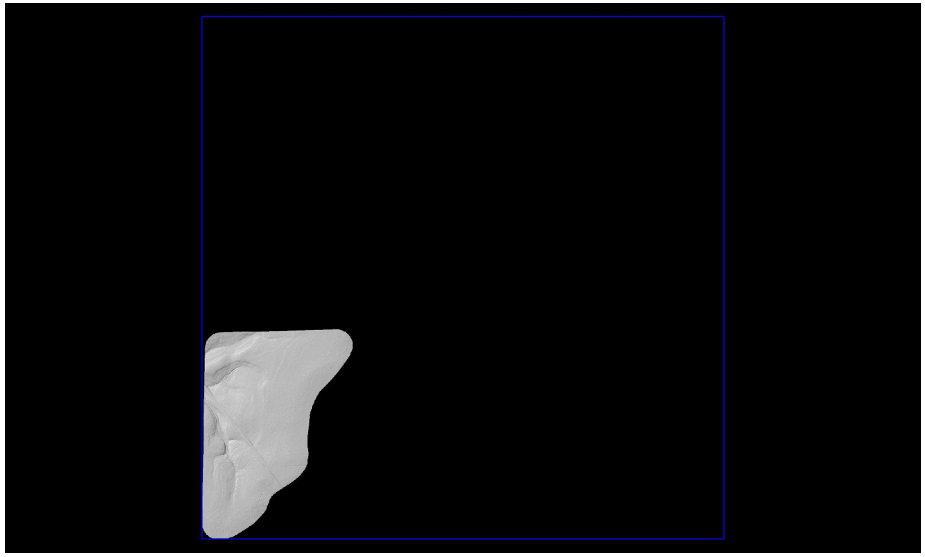
The USGS Lidar Base Specification Version 1.2 states: "Following classification processing, no nonwithheld points will remain in Class 0.
• For QL3 data, within any 1 square km, no more than 2 percent of nonwithheld points will have demonstrable errors in the classification value.
• For QL2 data, within any 1 square km, no more than 1 percent of nonwithheld points will have demonstrable errors in the classification value.
• For QL1 and QL0 data, within any 1 square km, no more than 0.5 percent of nonwithheld points will have demonstrable errors in the classification value.
• Points remaining in Class 1 that should be classified in any other required class are subject to these accuracy requirements and will be counted towards the percentage thresholds."
The USGS-NGP may relax these requirements to accommodate collections in areas where classification is particularly difficult.

The purpose of this section is to overlay a 1km x 1km tile scheme over the bare earth surface hillshade product to use for ground filter QC inspection.

Data Source - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\Final_Client_Deliverables\Block2_MiddleRioGrandeEast\point_cloud\tilecls

Result Path - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Admin\QA_QC\04_17_2018_Middle_Rio_Grande_East\DPH_15_16\Area1\Hillshade_SingleFile.jp2

Tile Shapefile - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Admin\QA_QC\04_17_2018_Middle_Rio_Grande_East\DPH_15_16\Area1\tile.shp



DPH-15.2 Report on Classification Accuracy

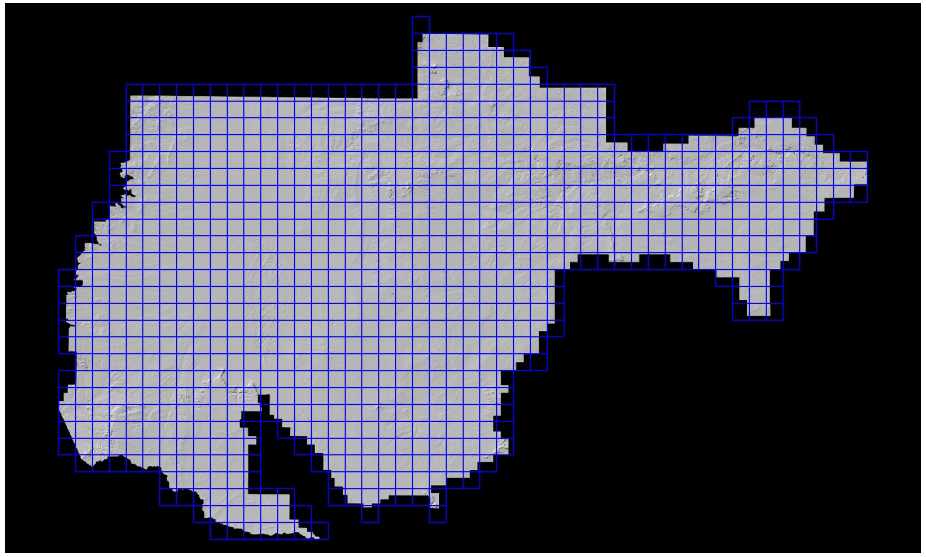
The USGS Lidar Base Specification Version 1.2 states: "Following classification processing, no nonwithheld points will remain in Class 0.
• For QL3 data, within any 1 square km, no more than 2 percent of nonwithheld points will have demonstrable errors in the classification value.
• For QL2 data, within any 1 square km, no more than 1 percent of nonwithheld points will have demonstrable errors in the classification value.
• For QL1 and QL0 data, within any 1 square km, no more than 0.5 percent of nonwithheld points will have demonstrable errors in the classification value.
• Points remaining in Class 1 that should be classified in any other required class are subject to these accuracy requirements and will be counted towards the percentage thresholds."
The USGS-NGP may relax these requirements to accommodate collections in areas where classification is particularly difficult.

The purpose of this section is to overlay a 1km x 1km tile scheme over the bare earth surface hillshade product to use for ground filter QC inspection.

Data Source - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\Final_Client_Deliverables\Block2_MiddleRioGrandeEast\point_cloud\tilecls

Result Path - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Admin\QA_QC\04_17_2018_Middle_Rio_Grande_East\DPH_15_16\Area2\Hillshade_SingleFile.jp2

Tile Shapefile - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Admin\QA_QC\04_17_2018_Middle_Rio_Grande_East\DPH_15_16\Area2\tile.shp



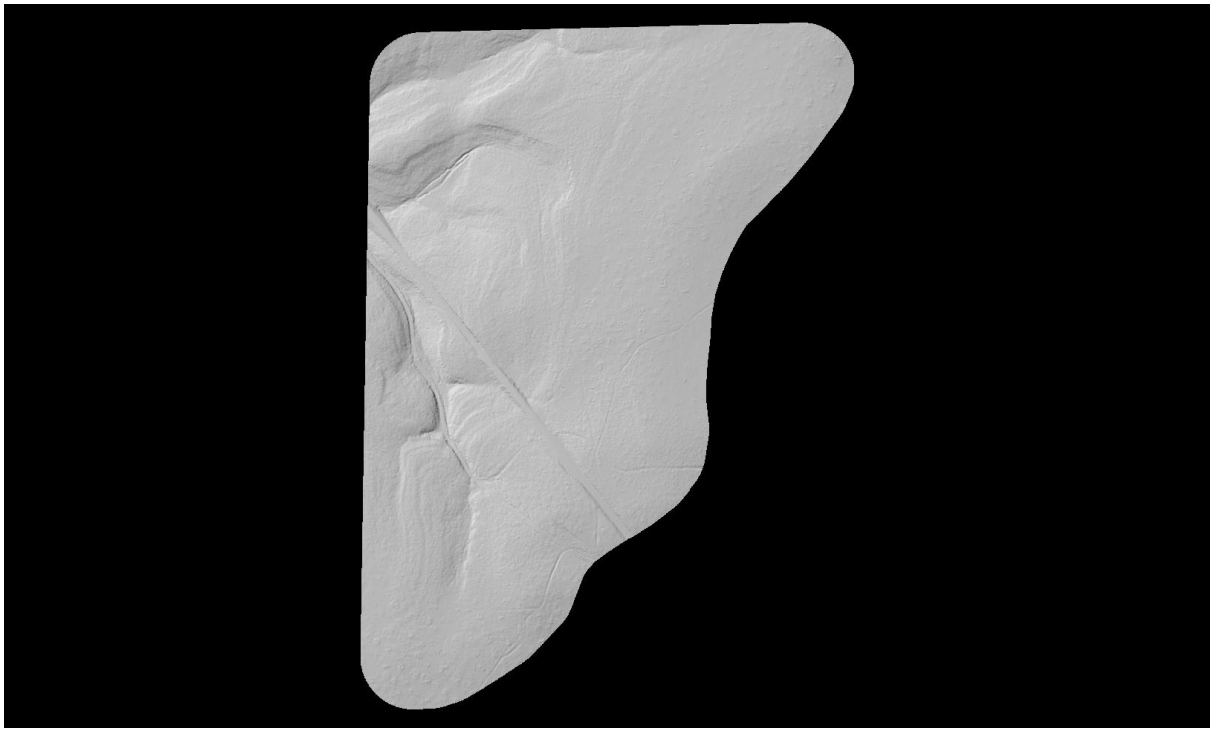
DPH-16.1 Report on Classification Consistency

The USGS Lidar Base Specification Version 1.2 states: "Point classification is to be consistent across the entire project. Noticeable variations in the character, texture, or quality of the classification between tiles, swaths, lifts, or other non-natural divisions will be cause for rejection of the entire deliverable."

The purpose of this section is to show the bare earth surface hillshade product for classification consistency inspection.

Data Source - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\Final_Client_Deliverables\Block2_MiddleRioGrandeEast\point_cloud\tilecls

Result Path - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Admin\QA_QC\04_17_2018_Middle_Rio_Grande_East\DPH_15_16\Area1\Hillshade_SingleFile.jp2



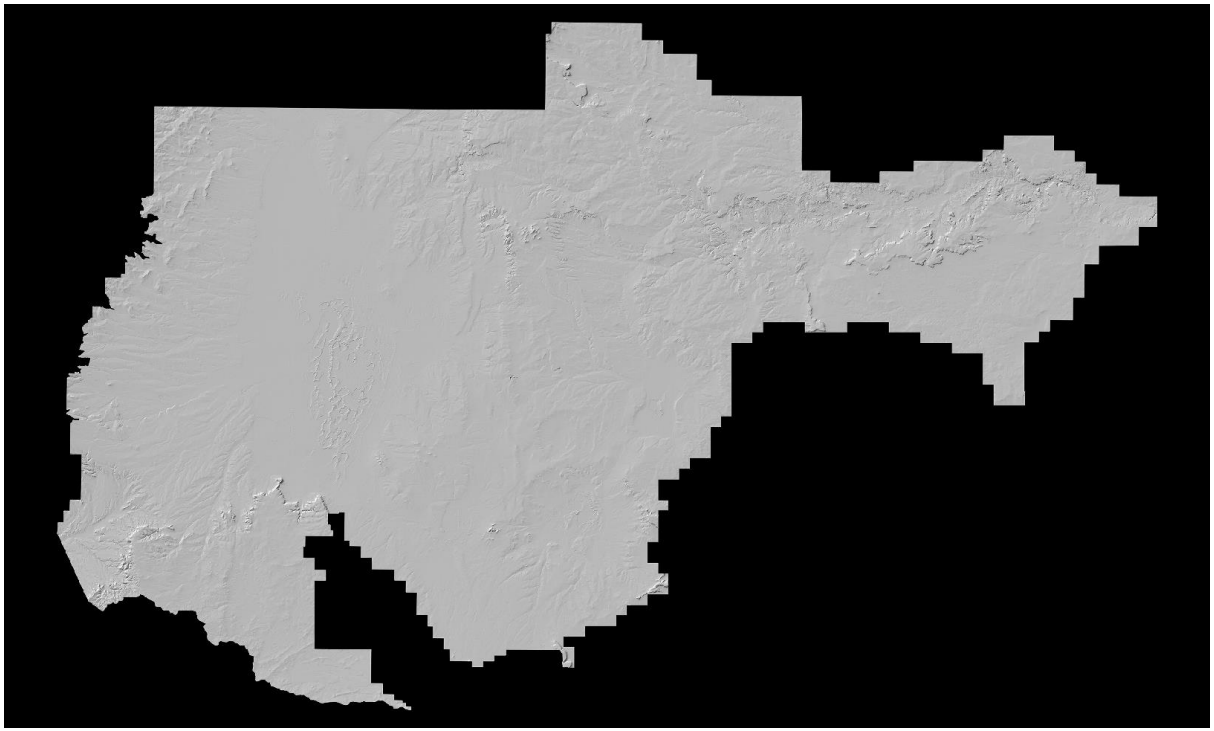
DPH-16.2 Report on Classification Consistency

The USGS Lidar Base Specification Version 1.2 states: "Point classification is to be consistent across the entire project. Noticeable variations in the character, texture, or quality of the classification between tiles, swaths, lifts, or other non-natural divisions will be cause for rejection of the entire deliverable."

The purpose of this section is to show the bare earth surface hillshade product for classification consistency inspection.

Data Source - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Production\Final_Client_Deliverables\Block2_MiddleRioGrandeEast\point_cloud\tilecls

Result Path - Y:\Mapping\Projects\65219750_NM_NRCS_Central\Admin\QA_QC\04_17_2018_Middle_Rio_Grande_East\DPH_15_16\Area2\Hillshade_SingleFile.jp2



DPH-17 Report on Tiles

The USGS Lidar Base Specification Version 1.2 states: "A single non-overlapping project tiling scheme will be established and agreed upon by the data producer and the USGS–NGP before collection. This scheme will be used for all tiled deliverables: The tiling scheme shall use the same coordinate reference system and units as the data. The tile size shall be an integer multiple of the cell size for raster deliverables. The tiles shall be indexed in x and y to an integer multiple of the x and y dimensions of the tile. The tiled deliverables shall edge-match seamlessly and without gaps. The tiled deliverables shall conform to the project tiling scheme without added overlap."

The purpose of this section is to report on the unallowed presence of overlap in the project tile scheme.

Tile File: Y:\Mapping\Projects\65219750_NM_NRCS_Central\Admin\PM_Shapes\Final_Bdy_Tiles\MiddleRioGrande_East\NM_NRCS_Central_MiddleRioGrandeEast_tiles_3827total.shp

Units: Meter

The following lists tiles that are overlapped.

Tile	Width	Height	Overlap

NONE

The following lists tile widths/heights in the project.

1500.000/1500.000