

Elevation QC Report

Project: OR_OLC-CVO-Shasta_2010 **Contractor:** Watershed Sciences
Data Delivery Date: 06/23/2011 **Date Data Reviewed:** 06/27/2011
Reviewer: Hannah Boggs/Kim Robinson **Total Square Miles Reviewed:** 849.00 square miles
Elevation Type: LIDAR **Format:** LAS **Grid Spacing:** 1.0 meters **Tile size:** 7.5' by 7.5'
Projection: UTM **Zone:** 10 **Datum:** NAD83 **Units:** Meters
Licensing: Public Domain **Metadata:** Project Level

Materials Received:

LAS

- All_Points (classified LAS)
- Grounds (Bare Earth LAS)

Shapefiles:

- Ground Control Points (RTK_Shasta.shp)
- Tiling Scheme Shapefile for LAS (Shasta_075_UTM10_with_Quarters_TAF.shp)
- Project Footprint Shapefile (Shasta_075_TAF.shp)
- Shasta_BINS.shp
- Shasta_1_400th_TAF.shp

Rasters:

- Digital Elevation Models (DEM's)
- Ground Density Rasters
- Intensity files
- Highest Hit (1st returns)

Metadata:

- DEM metadata (will function as project metadata) (xml format)
- LAS metadata (.txt format)
- Metadata for all shapefiles delivered (xml format)
- Metadata for all other delivered rasters (xml format)
- Data report for entire project from Watershed sciences (.pdf format)
- Data acceptance report from DOGAMI (.pdf format)

Miscellaneous:

- Shasta_1_400th_Full_quad.dgn
- Shasta_1_400th_Quad_TAF.dgn
- Shasta_075_Full_UTM_10_With_Quarters.dgn
- Shasta_075_UTM_10_With_Quarters.dgn
- Shasta_BINS

Vertical Accuracy Test Performed: No **Test Point Source:** None

RMSE:

See below

Vertical Accuracy Notes:

Reviewer was unable to conduct a Vertical Accuracy test due to a lack of check points that were of a higher accuracy than the LiDAR data.

Vertical Accuracy of the data was calculated by the contractor. Contractor used Real Time Kinematic (RTK) ground survey points. Reviewer approves collection method, distribution, and amount of points collected for this dataset. There were 3,236 well distributed RTK points.

Reported RMSE is 0.04 meters.

Reported standard deviation (2 sigma): 0.09 meters

Please see QC Review Summary and NED processing Steps on the following two pages.

Trajectory files were not received. A shapefile with the DEM tiling scheme was not received. All other deliverables were received. Reviewer checked completeness and formatting in Global Mapper and ArcMap. Deliverables sent matched formatting required by project guidelines reported in the "OLC Mt. Shasta Delivery Acceptance Report".

Reviewer created a shapefile with the DEM tiling scheme in Global Mapper 12. Reviewer used the clip function in ArcMap to format tiling scheme to final project boundary. This shapefile is included in METADATA - Shapefiles - DEM tiling scheme folder.

METADATA:

Metadata for the DEM datasets that will function as the project level metadata were run through the Metadata Parser in ArcCatalog. While general information is included and the metadata files reference the FGDC Content Standards for Digital Geospatial Metadata, the metadata parser came up with 29 errors. Metadata is in xml format. These errors will be detailed later in this document.

Reviewer fixed as many errors as possible and created a new project level metadata file for the NED titled OR_OLC-CVO-Shasta-2010.xml. This is the best use metadata file for this project. It is located under the METADATA - Documents folder.

LAS:

Reviewer loaded the classified LAS "all returns" into Global Mapper. LAS was tiled in a 100th quad scheme. Classifications reviewer was able to see in Global Mapper included unclassified and ground. Reviewer used several filters (vegetation, building, low noise) however there were no points within these classifications.

Reviewer loaded the LAS "grounds" into Global Mapper. LAS conformed to the 100th quad tiling scheme. Global Mapper filter showed only "ground" classification for these points.

DIGITAL ELEVATION MODELS:

Reviewer loaded the ArcGrids into a Global Mapper Catalog for review. Reviewer used UTM Zone 10 projection in the review. The data was examined at an average scale of 1:5600 throughout the project area.

There was no requirement for treatment of waterbodies or double line streams, therefore waterbodies are not flattened and double line streams have not been forced to drain downhill. Reviewer created a shapefile showing waterbodies that have not been flattened for reference purposes. Examples will be provided below.

Bare earth surface is good. Through the majority of the project, there is not excessive "over-editing" of the bare earth points. All vegetation, bridges, and buildings appear to be removed properly. The surface is free from artifacts at the edges, very high points that are most likely noise, and quilting.

Reviewer noticed one potential issue with the data. There are pits either located on or alongside the roads in this dataset. The pits on the road are about 0.5 meters deep, whereas the pits alongside the road are 1.0 - 3.0 meters deep. Reviewer is unsure whether or not these are caused by points that should not be classified as bare-earth, or actual bare earth. Reviewer included this in the shapefile of errors. Reviewer has created a shapefile of this area and is including it in the delivery to the NED. Examples of these issues will be shown below.

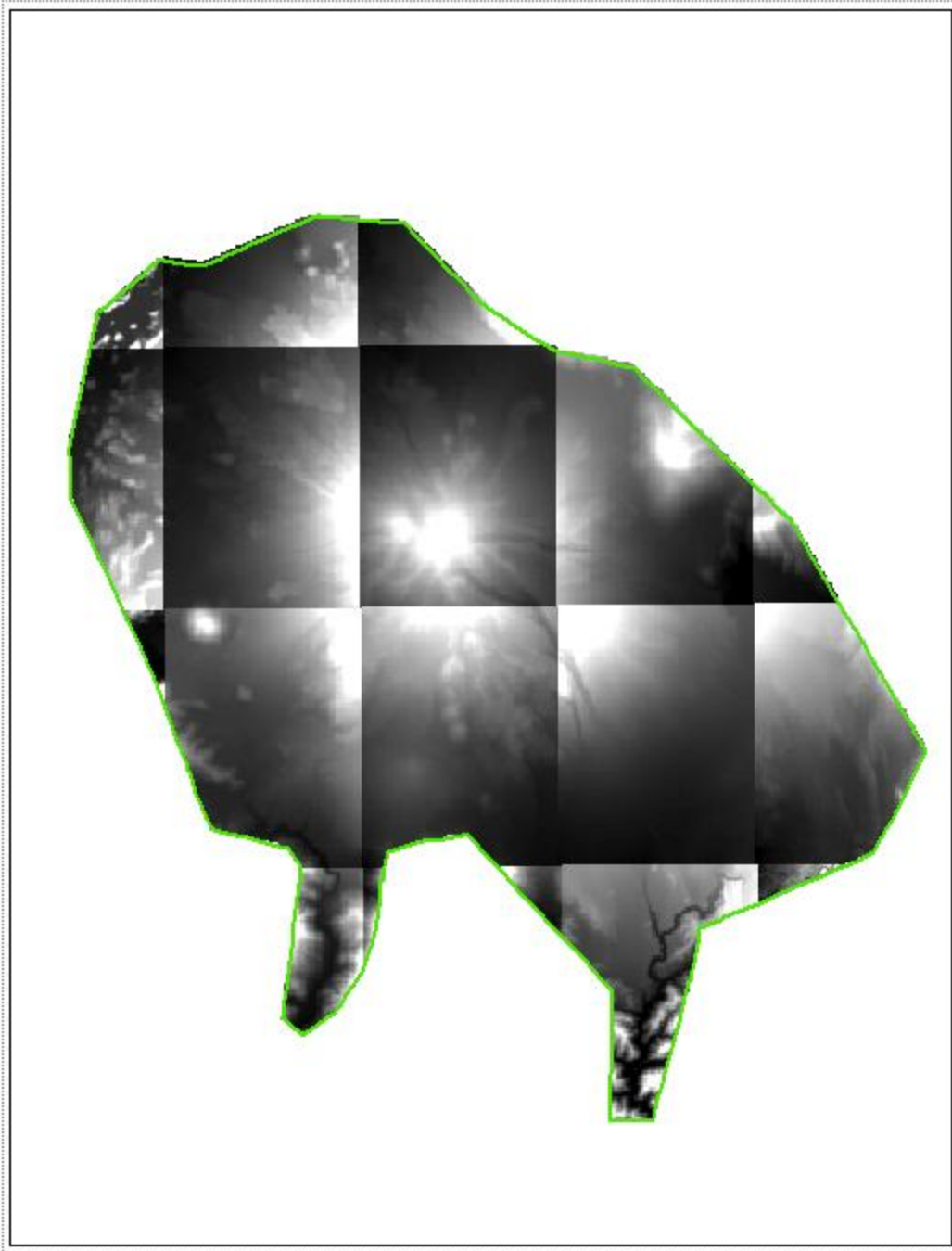
This data is recommended for NED 1/9th.

PROCESSING STEP FOR THE NED :

Reviewer loaded the ArcGrids into ArcMap. Using the Mosaic to Raster Model, reviewer created a large ArcGrid file. Reviewer loaded all provided DEM datasets into the Mosaic To New Raster model. The reviewer used the 32 bit signed parameter, and the blend method because there were over-lapping tiles. Reviewer kept original projection and resolution (UTM Zone 10 NAD 83, 1.00 meter cell size).

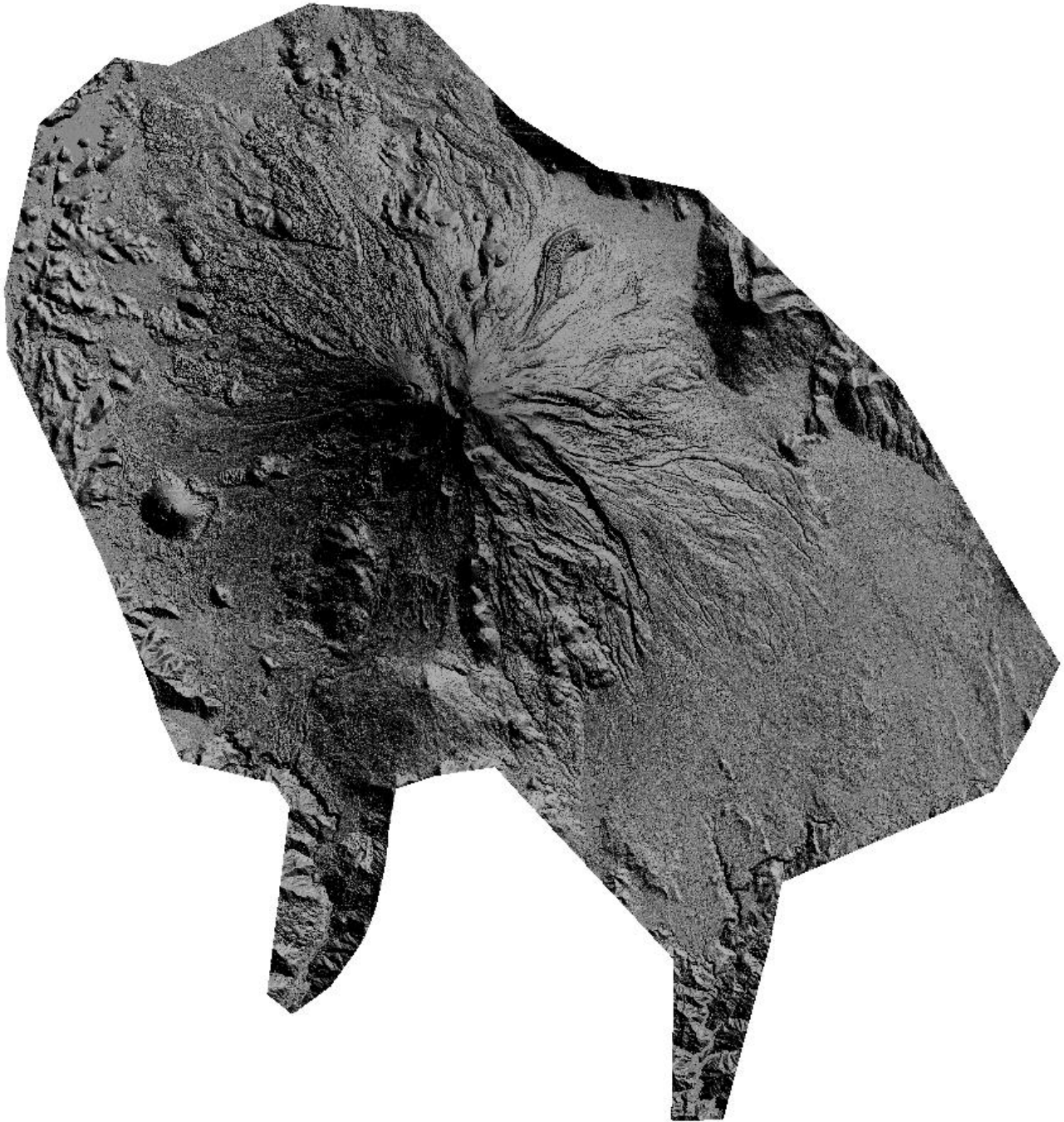
OR OLC-CVO-Shasta 2010: Project Area

Scale = 1:248,787

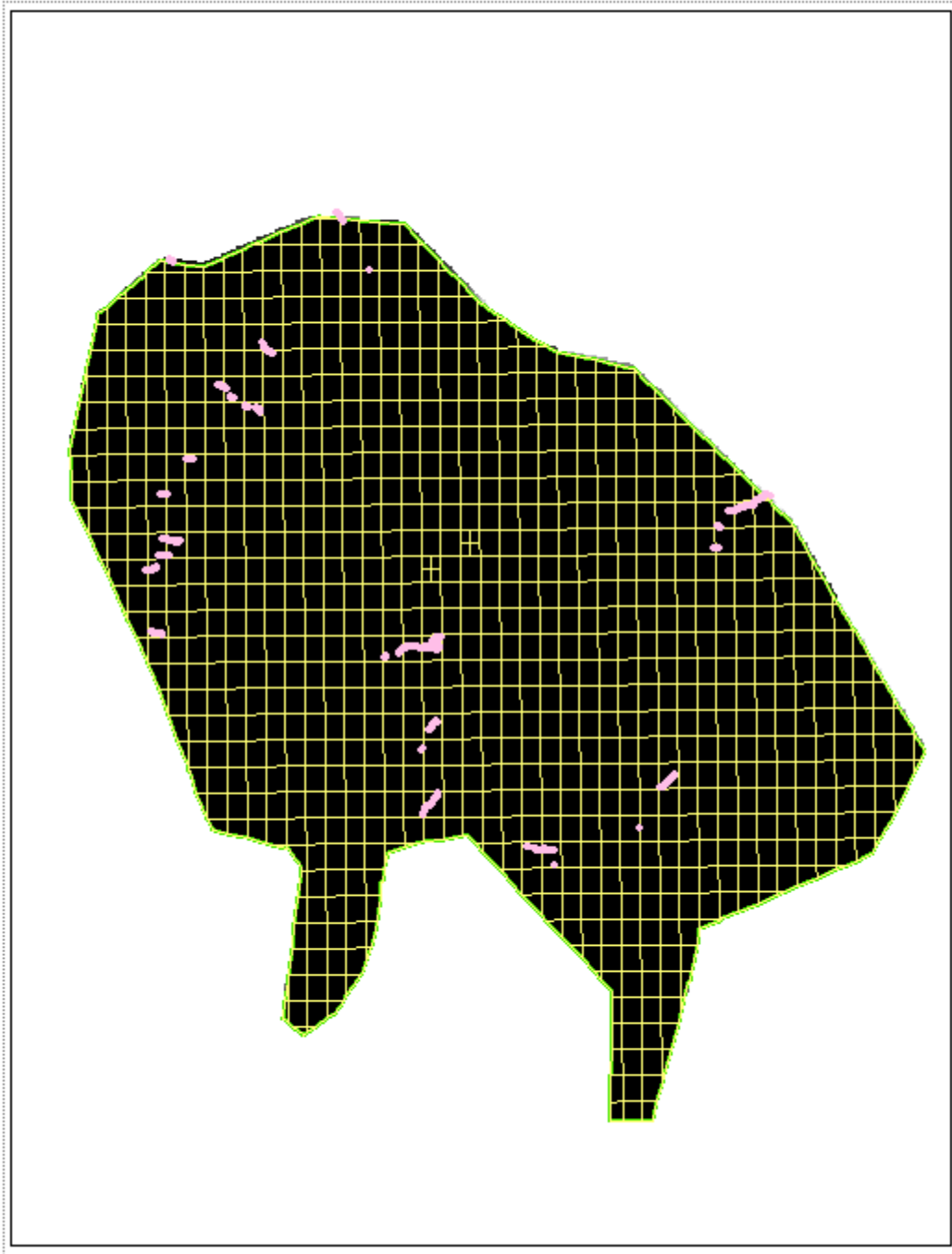


OR OLC-CVO-Shasta 2010: Project Area Hillshade

Scale = 1:206,200

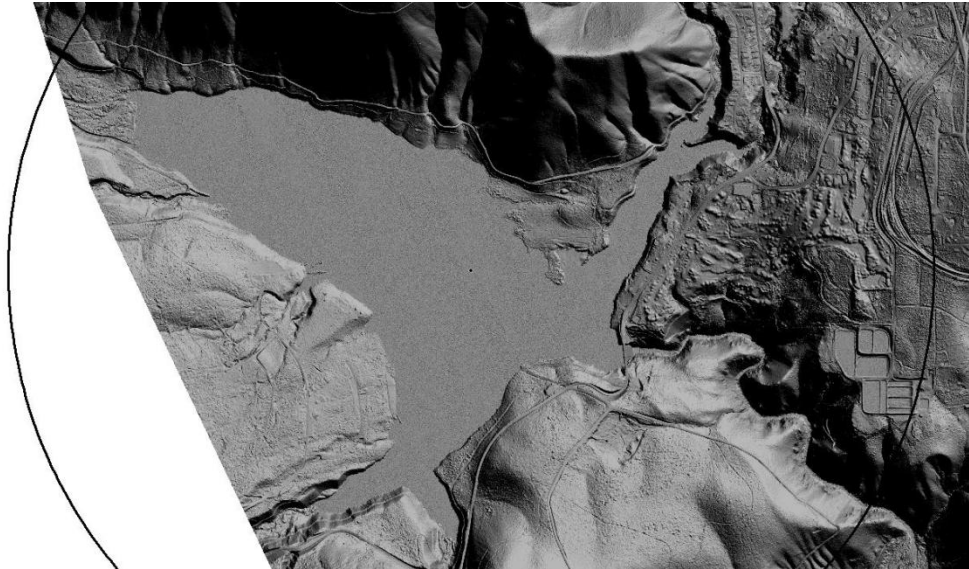


Scale = 1:248,787



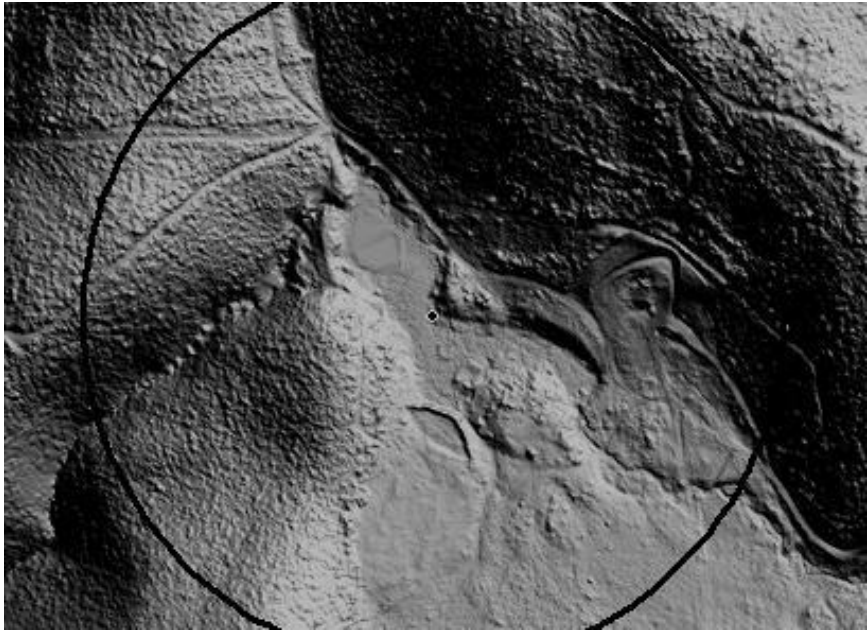
OR OLC-CVO-Shasta 2010: Example of Waterbody Not Flattened

Scale = 1:29110



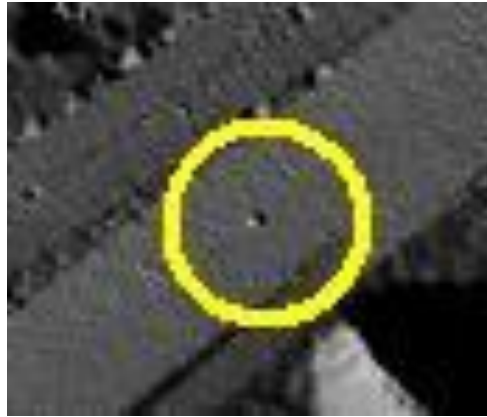
OR OLC-CVO-Shasta 2010: Example of Waterbody Not Flattened (2)

Scale = 1:5717



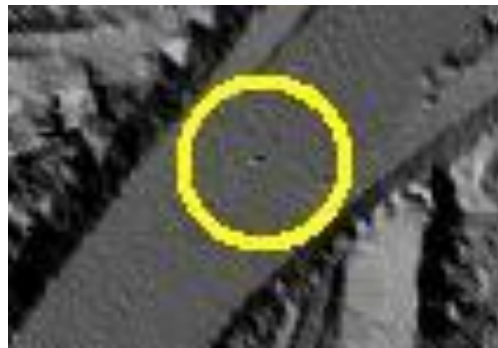
OR OLC-CVO-Shasta 2010: Example of Pit Issue on Road

Scale = 1:5445



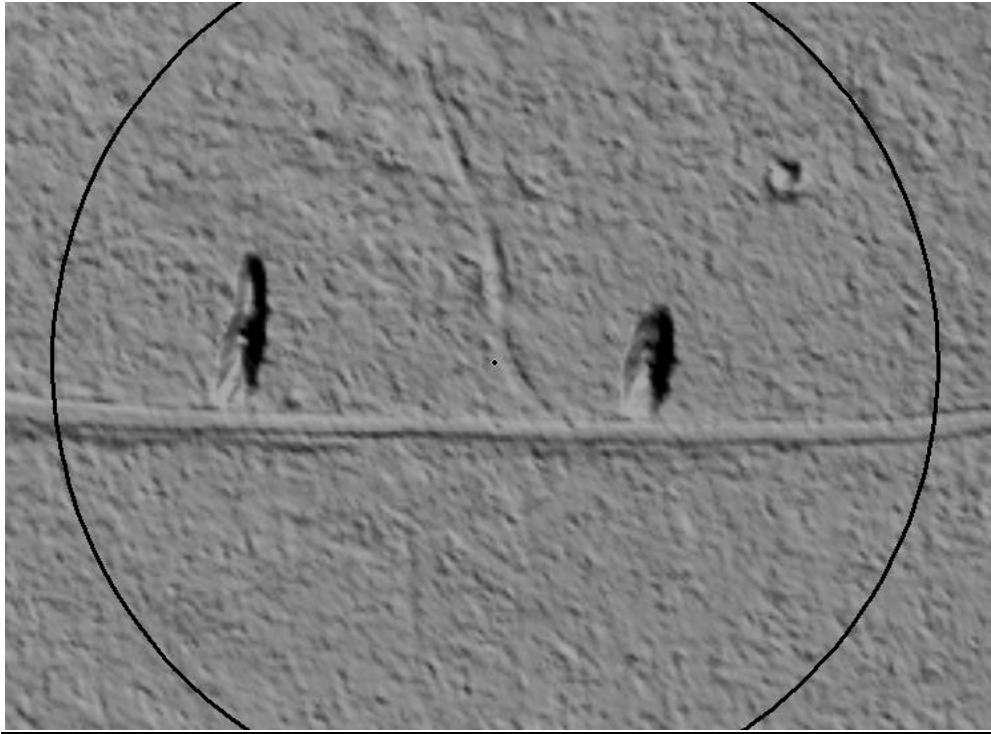
OR OLC-CVO-Shasta 2010: Example of Pit Issue on Road (2)

Scale = 1:5445



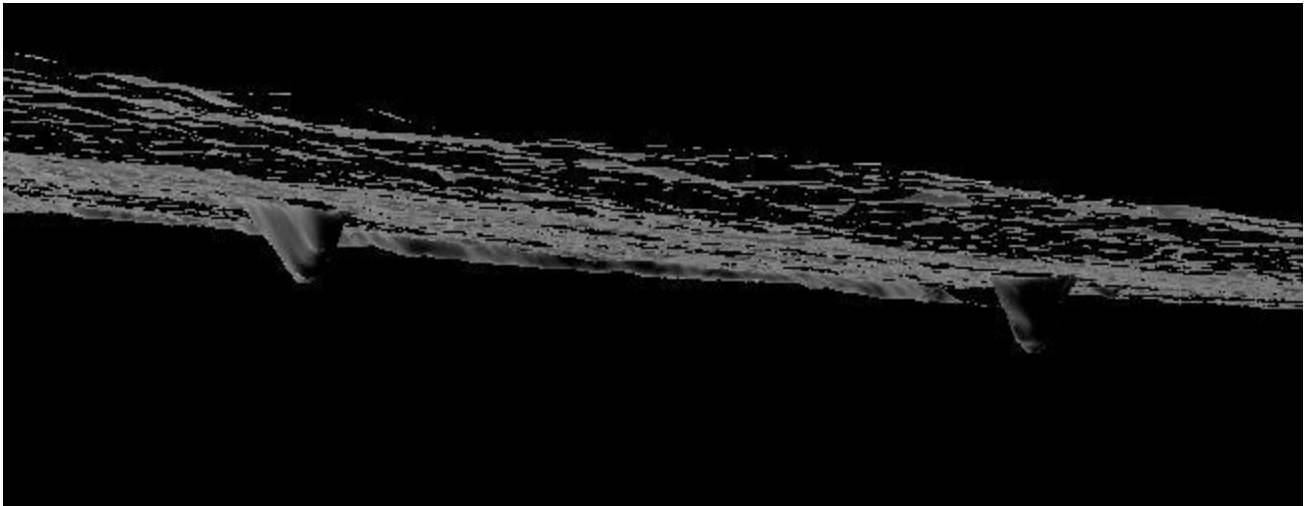
OR OLC-CVO-Shasta 2010: Example of Pit Issue Alongside of Road

Scale = 1:1419



OR OLC-CVO-Shasta 2010: Example of Pit Issue Alongside of Road (3D)

Scale = 1:1419



OR OLC-CVO-Shasta 2010: Errors Found in Metadata Parser

```
Executing: mp "E:\LIDAR\Over the Fence\Oregon\OLC_Shasta\metadata.xml" # # #
Start Time: Mon Jun 27 13:59:51 2011
Running script mp...
"C:\ArcGIS\bin\mp.exe" metadata.xml 2>&1
mp metadata.xml
: mp 2.9.6 - Peter N. Schweitzer (U.S. Geological Survey)
: Info: input file = metadata.xml
: Error (line 10): improper value for Publication_Date
: Error (line 22): improper value for Beginning_Date
: Error (line 22): improper value for Ending_Date
: Error (line 48): Place_Keyword_Thesaurus is required in Place
: Error (line 51): Stratum_Keyword_Thesaurus is required in Stratum
: Error (line 51): Stratum_Keyword is required in Stratum
: Error (line 51): Temporal_Keyword_Thesaurus is required in Temporal
: Error (line 51): Temporal_Keyword is required in Temporal
: Error (line 83): Horizontal_Positional_Accuracy_Report is required in
Horizontal_Positional_Accuracy
: Error (line 84): Horizontal_Positional_Accuracy_Value is required in
Quantitative_Horizontal_Positional_Accuracy_Assessment
: Error (line 88): Vertical_Positional_Accuracy_Report is required in
Vertical_Positional_Accuracy
: Error (line 90): improper value for Vertical_Positional_Accuracy_Value
: Error (line 96): Process_Date is required in Process_Step
: Error (line 101): Process_Date is required in Process_Step
: Error (line 136): Entity_Type_Label is required in Entity_Type
: Error (line 136): Entity_Type_Definition is required in Entity_Type
: Error (line 136): Entity_Type_Definition_Source is required in Entity_Type
: Error (line 146): Attribute_Definition is required in Attribute
: Error (line 146): Attribute_Definition_Source is required in Attribute
: Error (line 146): Attribute_Domain_Values is required in Attribute
: Error (line 149): Attribute_Definition is required in Attribute
: Error (line 149): Attribute_Definition_Source is required in Attribute
: Error (line 149): Attribute_Domain_Values is required in Attribute
: Error (line 154): Distribution_Liability is required in Distribution_Information
: Error (line 156): Contact_Voice_Telephone is required in Contact_Information
: Error (line 161): Address_Type is required in Contact_Address
: Error (line 171): Fees is required in Standard_Order_Process
: Error (line 172): Digital_Transfer_Option is required in Digital_Form
: Error (line 173): Format_Name is required in Digital_Transfer_Information
: 29 errors: 25 missing, 4 bad_value
Completed script mp...
Executed (mp) successfully.
End Time: Mon Jun 27 13:59:51 2011 (Elapsed Time: 0.00 seconds)
```

**OR OLC-CVO-Shasta 2010: NGTOC corrected Metadata, Remaining Errors Found in
Metadata Parser**

```
Executing: mp "E:\LIDAR\Over the Fence\Oregon\OLC_Shasta\OR_OLC-CVO-Shasta_2010.xml" # #
#
Start Time: Mon Jun 27 15:53:14 2011
Running script mp...
"C:\ArcGIS\bin\mp.exe" OR_OLC-CVO-Shasta_2010.xml 2>&1
mp OR_OLC-CVO-Shasta_2010.xml
: mp 2.9.6 - Peter N. Schweitzer (U.S. Geological Survey)
: Info: input file = OR_OLC-CVO-Shasta_2010.xml
: Error (line 48): Place_Keyword_Thesaurus is required in Place
: Error (line 101): Process_Date is required in Process_Step
: Error (line 136): Entity_Type_Label is required in Entity_Type
: Error (line 136): Entity_Type_Definition is required in Entity_Type
: Error (line 136): Entity_Type_Definition_Source is required in Entity_Type
: Error (line 146): Attribute_Definition is required in Attribute
: Error (line 146): Attribute_Definition_Source is required in Attribute
: Error (line 146): Attribute_Domain_Values is required in Attribute
: Error (line 149): Attribute_Definition is required in Attribute
: Error (line 149): Attribute_Definition_Source is required in Attribute
: Error (line 149): Attribute_Domain_Values is required in Attribute
: Error (line 154): Distribution_Liability is required in Distribution_Information
: Error (line 156): Contact_Voice_Telephone is required in Contact_Information
: Error (line 161): Address_Type is required in Contact_Address
: Error (line 171): Fees is required in Standard_Order_Process
: Error (line 172): Digital_Transfer_Option is required in Digital_Form
: Error (line 173): Format_Name is required in Digital_Transfer_Information
: Error (line 182): Contact_Voice_Telephone is required in Contact_Information
: 18 errors: 18 missing
Completed script mp...
Executed (mp) successfully.
End Time: Mon Jun 27 15:53:14 2011 (Elapsed Time: 0.00 seconds)
```

Scale = 1:244,955

