

# Photoscan demo including georeferencing

GSA 2017

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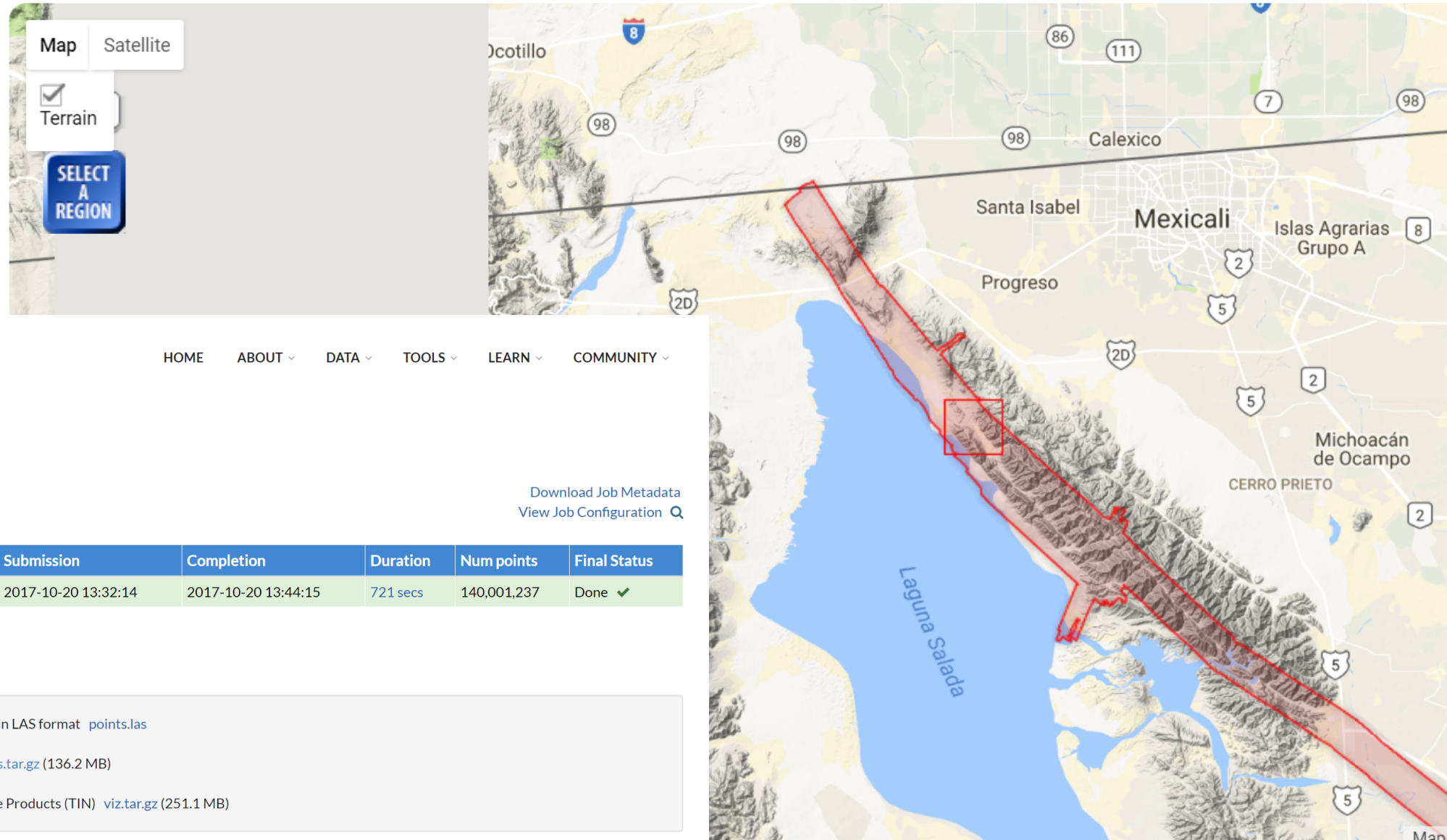


# OpenTopography

*High-Resolution Topography Data and Tools*


# El Mayor Cucupah post earthquake lidar dataset for reference


1a. Select area of data to download or process 



## Point Cloud Job Report

[Modify and resubmit this job](#)  
[Full job metadata report](#)

[Download Job Metadata](#)  
[View Job Configuration](#) 

Job Id	Dataset	Title	Submission	Completion	Duration	Num points	Final Status
pc1508531534468	EMC_EQ	EMC for georef	2017-10-20 13:32:14	2017-10-20 13:44:15	721 secs	140,001,237	Done 

## Download Job Results

Point Cloud Results

- Download point cloud data in LAS format [points.las](#)

DEM Results

- Download DEM (TIN) [dems.tar.gz](#) (136.2 MB)

Derivative Products

- Download Hillshade & Slope Products (TIN) [viz.tar.gz](#) (251.1 MB)



Workspace

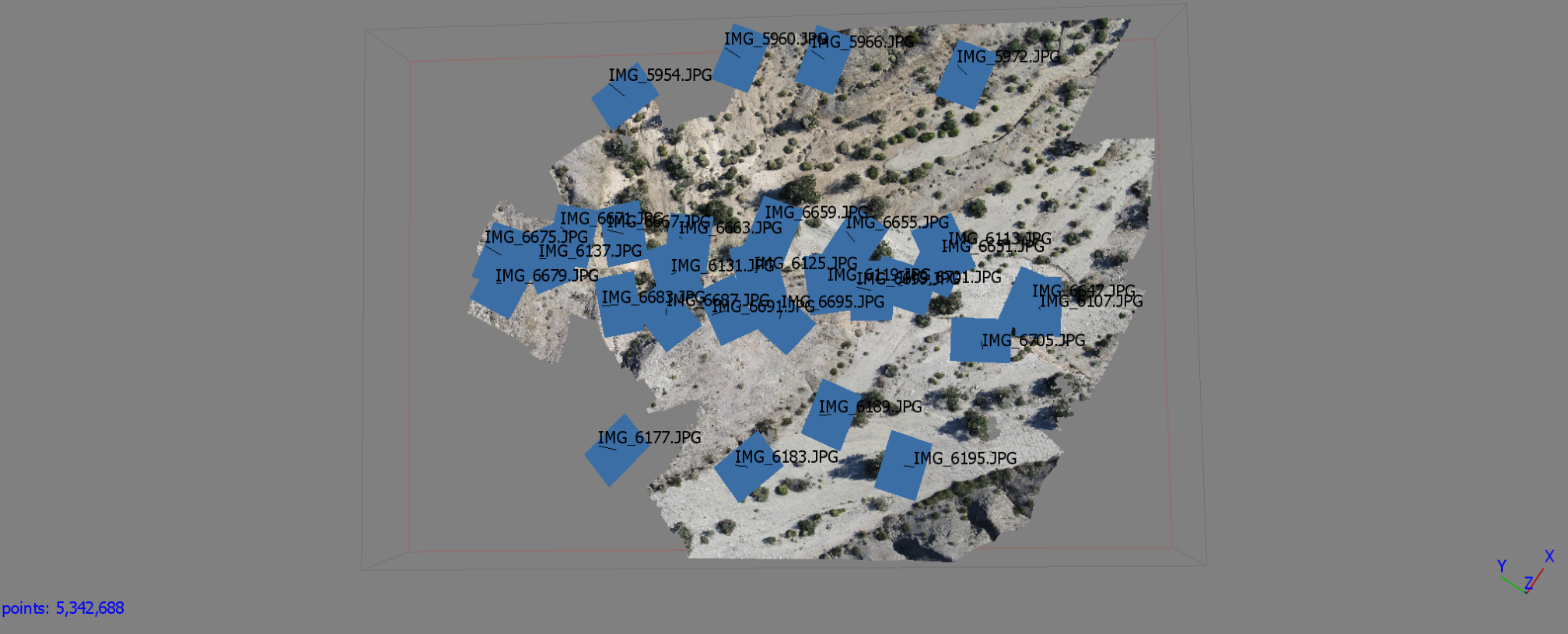


Workspace (1 chunks, 30 cameras)  
Chunk 1 (30 cameras, 39,545 points)

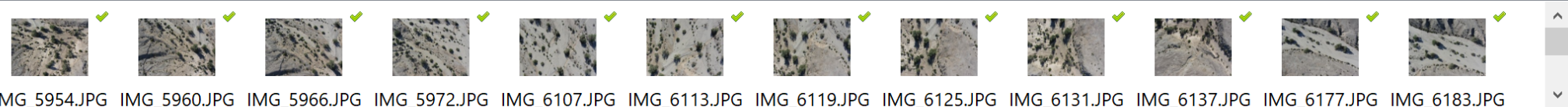


Model

Perspective 30°



Photos



IMG\_5954.JPG IMG\_5960.JPG IMG\_5966.JPG IMG\_5972.JPG IMG\_6107.JPG IMG\_6113.JPG IMG\_6119.JPG IMG\_6125.JPG IMG\_6131.JPG IMG\_6137.JPG IMG\_6177.JPG IMG\_6183.JPG

Workspace Reference

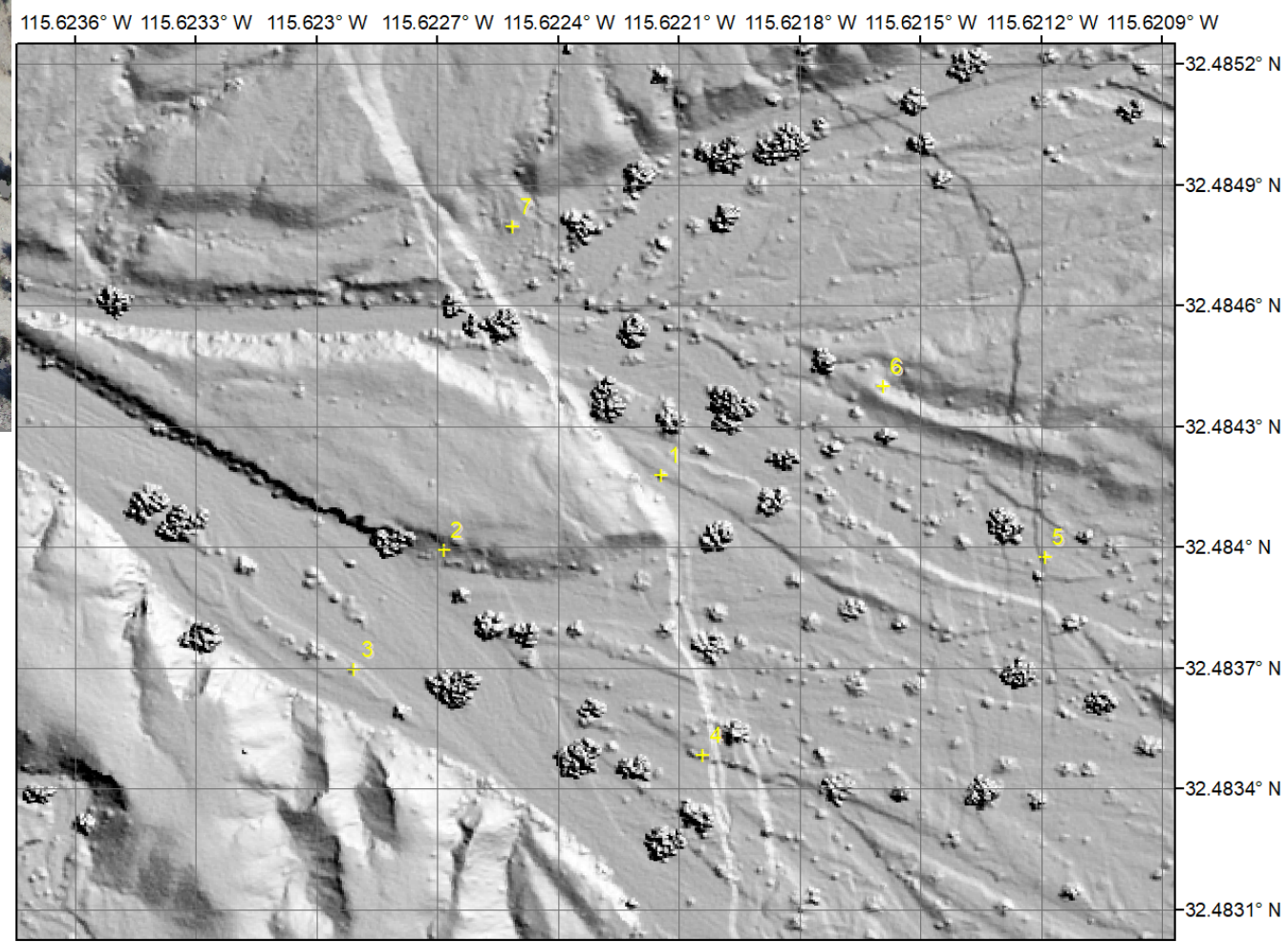
Photos Console





Dense cloud from Agisoft Photoscan

Reference points in ArcMap





File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help

1:1,109

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Layers

- GeoreferencingPoints
- output.tin\_045\_shd.tif
- output.tin.tif

Identify

Identify from: output.tin.tif

output.tin.tif

30.100000

Location: 4 32.484181 Decimal Degrees

Field	Value
Stretched value	41
Pixel value	30.100000

Identified 1 feature

label	E	N	H
1-115.622144	32.484181	30.58	
2-115.622685	32.483993	31.58	
3-115.622909	32.483699	31.02	
4-115.622044	32.483486	32.85	
5 -115.62119	32.483977	32.61	
6-115.621593	32.484404	31.66	
7-115.622512	32.484799	30.15	

# Photoscan Help for Documentation

Agisoft PhotoScan Help

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Options

Contents Search

- Overview
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  - Building digital elevation model
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  - Working with coded and non-coded targets
- Measurements

## Setting coordinate system

Many applications require data with a defined surface area and volume measurements and like digital elevation model export is available

PhotoScan supports setting a coordinate system. Coordinates are specified in the Reference pane

Setting coordinate system based on recorded processing close-range data sets collected with the coordinate system.

In case ground control points are used to set

Using camera data for georeferencing is faster and usually more accurate than telemetry data, etc.

## Placing markers

## Import the CSV from the Reference pane

Agisoft PhotoScan Professional

View Workflow Tools Photo Help

Point Cloud

Dense Cloud

Dense Cloud Classes

Shaded

Solid

Wireframe

Textured

Tiled Model

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Reference

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Import CSV

Coordinate System

WGS 84 (EPSG::4326)

Rotation angles:

Yaw, Pitch, Roll

Delimiter

Tab

Semicolon

Comma

Space

Other:

Combine consecutive delimiters

Columns

Label: 1

Accuracy

Rotation

Accuracy

Longitude: 2

8

Yaw: 5

9

Latitude: 3

8

Pitch: 6

9

Altitude: 4

8

Roll: 7

9

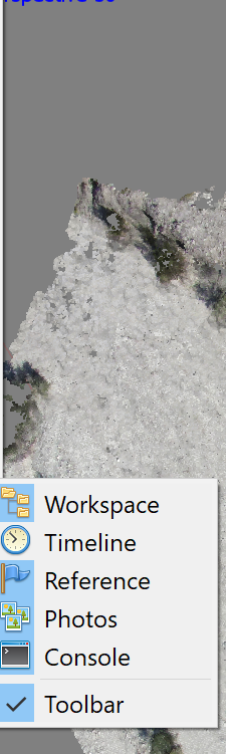
Enabled flag: 10

Start import at row: 1

Label	Longitude	Latitude	Altitude	Yaw	Pitch	Roll
label	E	N	H			
1	-115.622144	32.484181	30.58			

OK

Cancel





# Points import and are automatically roughly located (because original images had GPS information)

20171021 EMC\_Demo.psx\* — Agisoft PhotoScan Professional

File Edit View Workflow Tools Photo Help



Reference



Cameras	Longitude	Latitude	Altitude (m)	Accuracy (m)	Error (m)
<input checked="" type="checkbox"/> IMG_595...	-115.622145	32.484896	158.740000	10.000000	5.474934
<input checked="" type="checkbox"/> IMG_596...	-115.621865	32.484667	166.790000	10.000000	4.386562
<input checked="" type="checkbox"/> IMG_596...	-115.621733	32.484508	169.700000	10.000000	8.026827
<input checked="" type="checkbox"/> IMG_597...	-115.621532	32.484145	168.870000	10.000000	4.888108
<input checked="" type="checkbox"/> IMG_610...	-115.621970	32.483558	156.060000	10.000000	4.286450
<input checked="" type="checkbox"/> IMG_611...	-115.621916	32.483842	151.970000	10.000000	5.718806
<input checked="" type="checkbox"/> IMG_611...	-115.622240	32.484067	149.850000	10.000000	6.592184
<input checked="" type="checkbox"/> IMG_612...	-115.622337	32.484254	148.250000	10.000000	4.102252

Markers	Longitude	Latitude	Altitude (m)	Accuracy (m)	Error (m)
<input checked="" type="checkbox"/> 1	-115.622144	32.484181	30.580000	0.005000	
<input checked="" type="checkbox"/> 2	-115.622685	32.483993	31.580000	0.005000	
<input checked="" type="checkbox"/> 3	-115.622909	32.483699	31.020000	0.005000	
<input checked="" type="checkbox"/> 4	-115.622044	32.483486	32.850000	0.005000	
<input checked="" type="checkbox"/> 5	-115.621190	32.483977	32.610000	0.005000	
<input checked="" type="checkbox"/> 6	-115.621593	32.484404	31.660000	0.005000	
<input checked="" type="checkbox"/> 7	-115.622512	32.484799	30.150000	0.005000	
<input checked="" type="checkbox"/> label	0.000000	0.000000	0.000000	0.005000	

**Total Error**

Control points

Check points

Scale Bars	Distance (m)	Accuracy (m)	Error (m)
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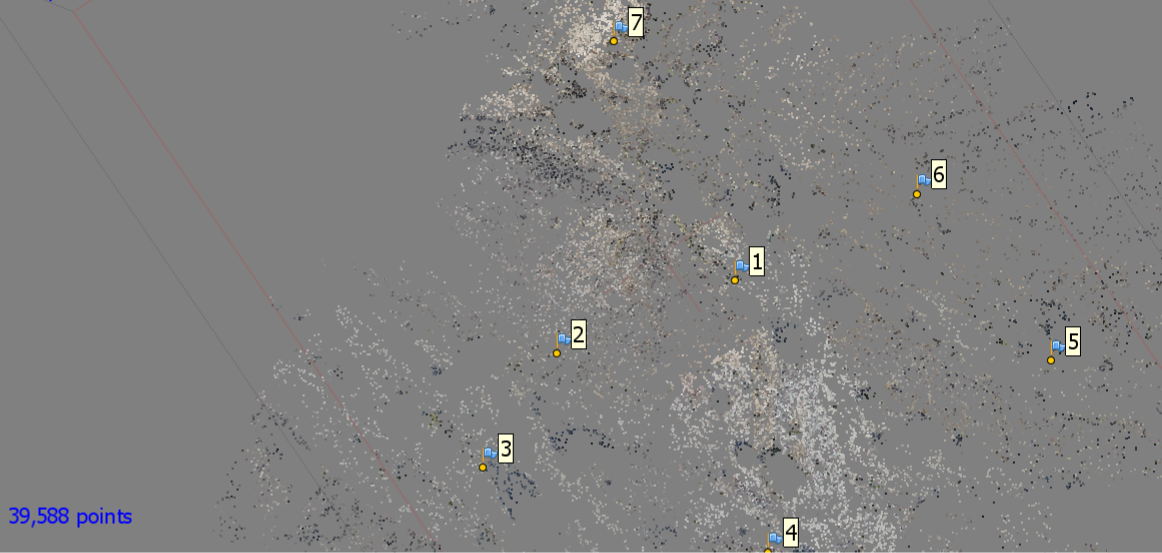
**Total Error**

Control scale ...

Check scale b...

Model

Perspective 30°



Photos



Photos

Console



# Refine marker locations to “pin them” for georeferencing use

before



after





During georeferencing the model is linearly transformed using 7 parameter similarity transformation (3 parameters for translation, 3 for rotation and 1 for scaling).

Update  
Georeferencing  
and Optimize  
cameras

Reference						
Cameras						
<input checked="" type="checkbox"/>		Longitude	Latitude	Altitude (m)	Accuracy (m)	Error (m)
<input checked="" type="checkbox"/>	IMG_595...	-115.622145	32.484896	158.740000	10.000000	38.949371
<input checked="" type="checkbox"/>	IMG_596...	-115.621865	32.484667	166.790000	10.000000	46.319335
<input checked="" type="checkbox"/>	IMG_596...	-115.621733	32.484508	169.700000	10.000000	49.839054
<input checked="" type="checkbox"/>	IMG_597...	-115.621532	32.484145	168.870000	10.000000	49.478940
<input checked="" type="checkbox"/>	IMG_610...	-115.621970	32.483558	156.060000	10.000000	45.170387
<input checked="" type="checkbox"/>	IMG_611...	-115.621916	32.483842	151.970000	10.000000	44.788875
<input checked="" type="checkbox"/>	IMG_611...	-115.622240	32.484067	149.850000	10.000000	38.334906
<input checked="" type="checkbox"/>	IMG_612...	-115.622337	32.484254	148.250000	10.000000	39.779481
Markers						
<input checked="" type="checkbox"/>		Longitude	Latitude	Altitude (m)	Accuracy (m)	Error (m)
<input checked="" type="checkbox"/>	1	-115.622144	32.484181	30.580000	0.005000	4.700532
<input checked="" type="checkbox"/>	2	-115.622685	32.483993	31.580000	0.005000	3.773468
<input checked="" type="checkbox"/>	3	-115.622909	32.483699	31.020000	0.005000	1.002155
<input checked="" type="checkbox"/>	4	-115.622044	32.483486	32.850000	0.005000	1.176743
<input checked="" type="checkbox"/>	5	-115.621190	32.483977	32.610000	0.005000	1.421455
<input checked="" type="checkbox"/>	6	-115.621593	32.484404	31.660000	0.005000	2.599162
<input type="checkbox"/>	7	-115.622512	32.484799	30.150000	0.005000	187.289197
<b>Total Error</b>						
Control points						2.813636
Check points						187.289197

I could not locate 7  
well, so I unclicked it  
to not use it

To place a marker using guided approach

Open a photo where the marker is visible by double clicking on its name.

Switch to the marker editing mode using Edit Markers toolbar button.

Right click on the photo at the point corresponding to the marker location.

Select Create Marker command from the context menu. New marker will be created and its projections on the other photos will be automatically defined.

[Note] Note

If the 3D model is not available or the ray at the selected point does not intersect with the model surface, the marker projection will be defined on the current photo only.

Guided marker placement can be performed in the same way from the 3D view by right clicking on the corresponding point on the model surface and using Create Marker command from the context menu. While the accuracy of marker placement in the 3D view is usually much lower, it may be still useful for quickly locating the photos observing the specified location on the model. To view the corresponding photos use Filter by Markers command again from the 3D view context menu. If the command is inactive, please make sure that the marker in question is selected on the Reference pane.



File Edit View Workflow Tools Photo Help



## Reference



Cameras	Easting (m)	Northing (m)	Altitude (m)	Ac
<input checked="" type="checkbox"/> IMG_595...	-115.622145	32.484896	158.740000	10
<input checked="" type="checkbox"/> IMG_596...	-115.621865	32.484667	166.790000	10
<input checked="" type="checkbox"/> IMG_596...	-115.621733	32.484508	169.700000	10
<input checked="" type="checkbox"/> IMG_597...	-115.621532	32.484145	168.870000	10
<input checked="" type="checkbox"/> IMG_610...	-115.621970	32.483558	156.060000	10
<input checked="" type="checkbox"/> IMG_611...	-115.621916	32.483842	151.970000	10
<input checked="" type="checkbox"/> IMG_611...	-115.622240	32.484067	149.850000	10
<input checked="" type="checkbox"/> IMG_612...	-115.622337	32.484254	148.250000	10

Markers	Easting (m)	Northing (m)	Altitude (m)	Ac
<input checked="" type="checkbox"/> 1	629462.890000	3594941.400000	30.580000	0.0
<input checked="" type="checkbox"/> 2	629412.360000	3594919.970000	31.580000	0.0
<input checked="" type="checkbox"/> 3	629391.720000	3594887.160000	31.020000	0.0
<input checked="" type="checkbox"/> 4	629473.480000	3594864.800000	32.850000	0.0
<input checked="" type="checkbox"/> 5	629552.450000	3594920.360000	32.610000	0.0
<input checked="" type="checkbox"/> 6	629514.220000	3594967.100000	31.550000	0.0
<input checked="" type="checkbox"/> 7	629427.040000			

## Total Error

Control points

Check points



Create Marker

Place Marker

Clear Markers

New Marker

Select Marker...

1

2

3

4

5

6

7





Align Photos

▼ General

Accuracy: High

☐ Generic preselection

☐ Reference preselection

▼ Advanced

Key point limit: 40,000

Tie point limit: 4,000

☐ Constrain features by mask

☒ Adaptive camera model fitting

OK Cancel