

A satellite view of Earth from space, showing the curvature of the planet and a bright blue horizon line. The ground below is a mix of green and brown, with a winding river or road visible. A small satellite is visible in the lower right corner.

# Tillämpningar för bildmatchade punktmoln

2017-03-29

Håkan Wiman

The Spacemetric logo consists of a stylized teal arc above the word "Spacemetric" in a white, sans-serif font.

**Spacemetric**

Image management solutions for satellite and airborne sensors

# Tillämpningar av punktmoln

- Generera andra 3D-produkter
  - Digitala ytmodeller (DSM)
  - Digitala höjdmodeller (DEM)
  - Triangular Irregular Networks (TIN)
  - 3D stadsmodeller
- Ortofotoframställning
  - Sanna (true) ortho photos
- Förändringsanalys
  - Skogliga tillämpningar
    - trädhöjd, tillväxt, volym, yta, hyggeskartering
  - Urbana tillämpningar
    - nybyggnationer, rivningar, infrastruktur, byggnader
- Miljö
  - modellering av utsläpp, bullerspridning, siktanalys, avrinning
- Skidbackar i Alperna, säkerhet vid statsbesök, hinder vid flygplatser....

Keystone Console

System Project Window Help

varg hw\_private Auto UTM

Basic Registration Workset Job Portal Order Admin

Image catalogue Strip catalogue

World Wind Progress

Attributes

Select any combination of search attributes. Leave blank for any image.

ID

Name

Tag GRUSTAG

Platform

Instrument

Scene version

Strip

Collection

Clouds

Countries

Min resolution

Max resolution

State

Type

Geometry

ROI

Keyword

Time

Result (6)

Name

- 13018025ssl6\_20~2013-05-20\_111437\_2614\_Rv
- 13018025ssl6\_20~2013-05-20\_111427\_2613\_Rv
- 11o248ss50\_13~2011-06-27\_074156\_14\_PAN\_L1
- 11o248ss50\_13~2011-06-27\_074143\_13\_PAN\_L1
- 08e48zz50\_31~2008-04-24\_091521\_39\_PAN\_L2
- 08e48zz50\_31~2008-04-24\_091510\_40\_PAN\_L2

Img Name

- 13018025ssl6\_20~2013-05-20\_111427\_2613\_RGB
- 13018025ssl6\_20~2013-05-20\_111437\_2614\_RGB
- 08e48zz50\_31~2008-04-24\_091510\_40\_PAN\_L2\_0
- 08e48zz50\_31~2008-04-24\_091521\_39\_PAN\_L2\_0
- 11o248ss50\_13~2011-06-27\_074156\_14\_HRA\_L2
- 11o248ss50\_13~2011-06-27\_074143\_13\_HRA\_L2
- 08e48zz50\_31~2008-04-24\_091521\_39\_P54\_L2\_08
- 08e48zz50\_31~2008-04-24\_091510\_40\_P54\_L2\_08

Opacity

Image I2148

Overview Image Scene Instrument Strip

E 665622.83 m N 6565722.36 m 58.88 m 1746.21 m 1.12 m

100 m

Keystone Console

System Project Window Help

varg hw\_private Auto UTM

Basic Registration Workset Job Portal Order Admin

Image catalogue Strip catalogue

World Wind Progress

Attributes

Select any combination of search attributes. Leave blank for any image.

ID

Name

Tag GRUSTAG

Platform

Instrument

Scene version

Strip

Collection

Clouds

Countries

Min resolution

Max resolution

State

Type

Geometry

ROI

Keyword

Time

Result (6)

Img	Name
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Opacity

E 669015.15 m N 6565713.04 m 61.01 m 1746.21 m 1.12 m

Keystone Console

System Project Window Help

varg hw\_private Auto UTM

Basic Registration Workset Job Portal Order Admin

World Wind Progress

Img	Name	State	State change	P
<input checked="" type="checkbox"/>	13018025ss16_20~2013-05-20_111427_2613_RGB_L2_13018025ss16 (I1154)	ONLINE		A
<input checked="" type="checkbox"/>	13018025ss16_20~2013-05-20_111437_2614_RGB_L2_13018025ss16 (I1153)	ONLINE		A
<input type="checkbox"/>	11o248ss50_13~2011-06-27_074143_13_PAN_L2_11o248 (I2145)	ONLINE		
<input type="checkbox"/>	11o248ss50_13~2011-06-27_074156_14_PAN_L2_11o248 (I2144)	ONLINE		
<input type="checkbox"/>	08e48z50_31~2008-04-24_091510_40_PAN_L2_08e48_E3 (I2147)	ONLINE		A
<input type="checkbox"/>	08e48z50_31~2008-04-24_091521_39_PAN_L2_08e48_E3 (I2146)	ONLINE		A

Opacity

E 665041.59 m N 6565468.75 m 67.38 m 1746.21 m 1.12 m

# 2013, Image 2 (using coarse global DEM)

Keystone Console

System Project Window Help


varg hw\_private Auto UTM

Basic Registration Workset Job Portal Order Admin

World Wind Progress

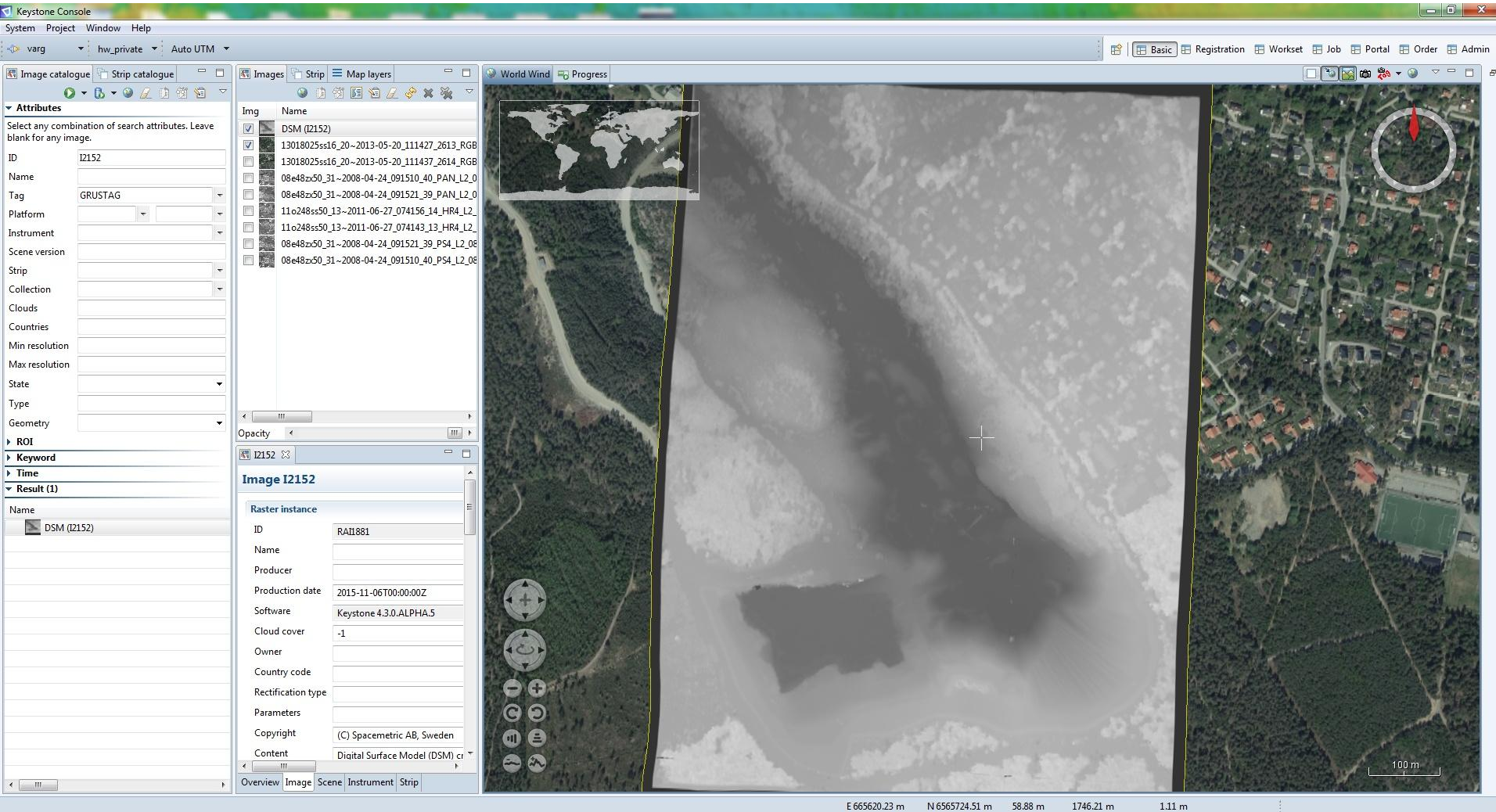
Img	Name	State	State change	P
<input type="checkbox"/>	13018025ss16_20~2013-05-20_111427_2613_RGB_L2_13018025ss16 (I1154)	ONLINE		A
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<input type="checkbox"/>	11o248ss50_13~2011-06-27_074143_13_PAN_L2_11o248 (I2145)	ONLINE		A
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<input type="checkbox"/>	08e48z50_31~2008-04-24_091510_40_PAN_L2_08e48_E3 (I2147)	ONLINE		A
<input type="checkbox"/>	08e48z50_31~2008-04-24_091521_39_PAN_L2_08e48_E3 (I2146)	ONLINE		A

Opacity



E 664690.33 m N 656599.23 m 51.19 m 1746.21 m 1.12 m

# 0.25m DSM generating from 3D point cloud



The screenshot displays the Spacemetric Keystone Console software interface. The main window shows a 3D visualization of a Digital Surface Model (DSM) overlaid on an aerial photograph of a residential area. The DSM is semi-transparent, revealing the underlying terrain and buildings. A white crosshair is visible in the center of the DSM. The interface includes several panels:

- Attributes Panel (Left):** Contains search filters for ID (I2152), Name, Tag (GRUSTAG), Platform, Instrument, Scene version, Strip, Collection, Clouds, Countries, Min resolution, Max resolution, State, Type, and Geometry.
- Image Catalogue (Top Left):** Lists various image files, including DSM (I2152) and several RGB and PAN images.
- Image I2152 Properties (Bottom Left):** Details for the selected DSM instance, including ID (RAI1881), Name, Producer, Production date (2015-11-06T00:00:00Z), Software (Keystone 4.3.0.ALPHA5), Cloud cover (-1), Owner, Country code, Rectification type, Parameters, Copyright ((C) Spacemetric AB, Sweden), and Content (Digital Surface Model (DSM) cr).
- World Wind (Top Center):** A small globe icon for navigation.
- Progress (Top Center):** A progress bar and status indicator.
- Navigation (Bottom Left):** A set of circular icons for navigation and zooming.
- Scale Bar (Bottom Right):** A scale bar indicating 100 meters.
- Status Bar (Bottom):** Displays coordinates: E 665620.23 m, N 6565724.51 m, 58.88 m, 1746.21 m, 1.11 m.

# 2013, Image 1 (using 0.25m DSM)

Keystone Console

System Project Window Help

varg hw\_private Auto UTM

Basic Registration Workset Job Portal Order Admin

Image catalogue Strip catalogue

Images Strip Map layers

World Wind Progress

Attributes

Select any combination of search attributes. Leave blank for any image.

ID I2152

Name

Tag GRUSTAG

Platform

Instrument

Scene version

Strip

Collection

Clouds

Countries

Min resolution

Max resolution

State

Type

Geometry

ROI

Keyword

Time

Result (1)

Name

DSM (I2152)

Img Name

<input checked="" type="checkbox"/>	13018025ss16_20~2013-05-20_111427_2613_RGB
<input checked="" type="checkbox"/>	13018025ss16_20~2013-05-20_111437_2614_RGB
<input checked="" type="checkbox"/>	DSM (I2152)
<input type="checkbox"/>	08e48zx50_31~2008-04-24_091510_40_PAN_L2_0
<input type="checkbox"/>	08e48zx50_31~2008-04-24_091521_39_PAN_L2_0
<input type="checkbox"/>	11e248ss50_13~2011-06-27_074156_14_HR4_L2_
<input type="checkbox"/>	11e248ss50_13~2011-06-27_074143_13_HR4_L2_
<input type="checkbox"/>	08e48zx50_31~2008-04-24_091521_39_PSA_L2_08
<input type="checkbox"/>	08e48zx50_31~2008-04-24_091510_40_PSA_L2_08

Opacity

Image I2152

Raster instance

ID RAI1881

Name

Producer

Production date 2015-11-06T00:00:00Z

Software Keystone 4.3.0.ALPHA5

Cloud cover -1

Owner

Country code


Rectification type

Parameters

Copyright (C) Spacemetric AB, Sweden

Content Digital Surface Model (DSM) cr

Overview Image Scene Instrument Strip



E 664485.40 m N 6565632.05 m 43.13 m 1746.21 m 1.11 m



Keystone Console

System Project Window Help

varg hw\_private Auto UTM

Basic Registration Workset Job Portal Order Admin

Image catalogue Strip catalogue

Images Strip Map layers

World Wind Progress

Attributes

Select any combination of search attributes. Leave blank for any image.

ID I2152

Name

Tag GRUSTAG

Platform

Instrument

Scene version

Strip

Collection

Clouds

Countries

Min resolution

Max resolution

State

Type

Geometry

ROI

Keyword

Time

Result (1)

Name

DSM (I2152)

Img Name

- 13018025ss16\_20~2013-05-20\_111427\_2613\_RGB
- 13018025ss16\_20~2013-05-20\_111437\_2614\_RGB
- DSM (I2152)
- 08e48zx50\_31~2008-04-24\_091510\_40\_PAN\_L2\_0
- 08e48zx50\_31~2008-04-24\_091521\_39\_PAN\_L2\_0
- 11e248ss50\_13~2011-06-27\_074156\_14\_HR4\_L2
- 11e248ss50\_13~2011-06-27\_074143\_13\_HR4\_L2
- 08e48zx50\_31~2008-04-24\_091521\_39\_PSA\_L2\_08
- 08e48zx50\_31~2008-04-24\_091510\_40\_PSA\_L2\_08

Opacity

Image I2152

Raster instance

ID RAI1881

Name

Producer

Production date 2015-11-06T00:00:00Z

Software Keystone 4.3.0.ALPHA5

Cloud cover -1

Owner

Country code

Rectification type

Parameters

Copyright (C) Spacemetric AB, Sweden

Content Digital Surface Model (DSM) cr

Overview Image Scene Instrument Strip

# 2013, Image 1 (using 0.25m DSM)

Keystone Console

System Project Window Help

varg hw\_private Auto UTM

Basic Registration Workset Job Portal Order Admin

Image catalogue Strip catalogue

World Wind Progress

Attributes

Select any combination of search attributes. Leave blank for any image.

ID I2152

Name

Tag GRUSTAG

Platform

Instrument

Scene version

Strip

Collection

Clouds

Countries

Min resolution

Max resolution

State

Type

Geometry

ROI

Keyword

Time

Result (1)

Name

DSM (I2152)

Image I2152

Raster instance

ID RAI1881

Name

Producer

Production date 2015-11-06T00:00:00Z

Software Keystone 4.3.0.ALPHA.5

Cloud cover -1

Owner

Country code

Rectification type

Parameters


Copyright (C) Spacemetric AB, Sweden

Content Digital Surface Model (DSM) cr

Overview Image Scene Instrument Strip

Img Name

- 13018025ss16\_20~2013-05-20\_111427\_2613\_RGB
- 13018025ss16\_20~2013-05-20\_111437\_2614\_RGB
- DSM (I2152)
- 08e48zx50\_31~2008-04-24\_091510\_40\_PAN\_L2\_0
- 08e48zx50\_31~2008-04-24\_091521\_39\_PAN\_L2\_0
- 11e248ss50\_13~2011-06-27\_074156\_14\_HR4\_L2\_
- 11e248ss50\_13~2011-06-27\_074143\_13\_HR4\_L2\_
- 08e48zx50\_31~2008-04-24\_091521\_39\_PSA\_L2\_08
- 08e48zx50\_31~2008-04-24\_091510\_40\_PSA\_L2\_08



20 m

E 665062.62 m N 6565091.54 m 28.92 m 460.74 m 0.27 m

Keystone Console

System Project Window Help

varg hw\_private Auto UTM

Basic Registration Workset Job Portal Order Admin

Image catalogue Strip catalogue

Images Strip Map layers

World Wind Progress

Attributes

Select any combination of search attributes. Leave blank for any image.

ID: I2152

Name: [empty]

Tag: GRUSTAG

Platform: [empty]

Instrument: [empty]

Scene version: [empty]

Strip: [empty]

Collection: [empty]

Clouds: [empty]

Countries: [empty]

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State: [empty]

Type: [empty]

Geometry: [empty]

ROI: [empty]

Keyword: [empty]

Time: [empty]

Result (1)

Name: DSM (I2152)

Img	Name
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<input checked="" type="checkbox"/>	13018025ss16_20~2013-05-20_111437_2614_RGB
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<input type="checkbox"/>	08e48zx50_31~2008-04-24_091510_40_PAN_L2_0
<input type="checkbox"/>	08e48zx50_31~2008-04-24_091521_39_PAN_L2_0
<input type="checkbox"/>	11e248ss50_13~2011-06-27_074156_14_HR4_L2_
<input type="checkbox"/>	11e248ss50_13~2011-06-27_074143_13_HR4_L2_
<input type="checkbox"/>	08e48zx50_31~2008-04-24_091521_39_PSA_L2_08
<input type="checkbox"/>	08e48zx50_31~2008-04-24_091510_40_PSA_L2_08

Opacity: [slider]

**Image I2152**

Raster instance

ID: RAI1881

Name: [empty]

Producer: [empty]

Production date: 2015-11-06T00:00:00Z

Software: Keystone 4.3.0.ALPHA.5

Cloud cover: -1

Owner: [empty]

Country code: [empty]

Rectification type: [empty]

Parameters: [empty]

Copyright: (C) Spacemetric AB, Sweden

Content: Digital Surface Model (DSM) cr

Overview Image Scene Instrument Strip

E 669061.46 m N 6565135.96 m 32.81 m 460.74 m 0.27 m

# 2013, Image 1 (using coarse global DEM)

Keystone Console

System Project Window Help

varg hw\_private Auto UTM

Basic Registration Workset Job Portal Order Admin

Image catalogue Strip catalogue

World Wind Progress

Attributes

Select any combination of search attributes. Leave blank for any image.

ID I2152

Name

Tag GRUSTAG

Platform

Instrument

Scene version

Strip

Collection

Clouds

Countries

Min resolution

Max resolution

State

Type

Geometry

ROI

Keyword


Time

Result (1)

Name

DSM (I2152)

Img	Name
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<input checked="" type="checkbox"/>	13018025ss16_20~2013-05-20_111437_2614_RGB
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<input type="checkbox"/>	08e48zx50_31~2008-04-24_091521_39_PAN_L2_0
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<input type="checkbox"/>	08e48zx50_31~2008-04-24_091521_39_PSA_L2_08
<input type="checkbox"/>	08e48zx50_31~2008-04-24_091510_40_PSA_L2_08



Opacity

E 669061.04 m N 6569086.63 m 68.91 m 460.74 m 0.27 m

# 2013, Image 2 (using coarse global DEM)

Keystone Console

System Project Window Help

varg hw\_private Auto UTM

Basic Registration Workset Job Portal Order Admin

Image catalogue Strip catalogue

Images Strip Map layers

World Wind Progress

Attributes

Select any combination of search attributes. Leave blank for any image.

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Name: [empty]

Tag: GRUSTAG

Platform: [empty]

Instrument: [empty]

Scene version: [empty]

Strip: [empty]

Collection: [empty]

Clouds: [empty]

Countries: [empty]

Min resolution: [empty]

Max resolution: [empty]

State: [empty]

Type: [empty]

Geometry: [empty]

ROI: [empty]


Keyword: [empty]

Time: [empty]

Result (1)

Name: DSM (I2152)

Img	Name
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<input checked="" type="checkbox"/>	13018025ss16_20~2013-05-20_111437_2614_RGB
<input checked="" type="checkbox"/>	DSM (I2152)
<input type="checkbox"/>	08e48zx50_31~2008-04-24_091510_40_PAN_L2_0
<input type="checkbox"/>	08e48zx50_31~2008-04-24_091521_39_PAN_L2_0
<input type="checkbox"/>	11e248ss50_13~2011-06-27_074156_14_HR4_L2
<input type="checkbox"/>	11e248ss50_13~2011-06-27_074143_13_HR4_L2
<input type="checkbox"/>	08e48zx50_31~2008-04-24_091521_39_PSA_L2_08
<input type="checkbox"/>	08e48zx50_31~2008-04-24_091510_40_PSA_L2_08



Opacity: [slider]

E 673864.57 m N 5450328.60 m N/A 460.74 m 0.27 m

20 m

# 2008, DSM from point cloud



Keystone Console

System Project Window Help

varg hw\_private Auto UTM

Basic Registration Workset Job Portal Order Admin

Image catalogue Strip catalogue

World Wind Progress

Attributes

Select any combination of search attributes. Leave blank for any image.

ID

Name

Tag GRUSTAG,DSM

Platform

Instrument

Scene version

Strip

Collection

Clouds

Countries

Min resolution

Max resolution

State

Type

Geometry

ROI

Keyword

Time

Result (2)

Name

- DSM (I2152)
- DSM (I2153)

Img Name

- 13018025ss16\_20~2013-05-20\_111427\_2613\_RGB
- 13018025ss16\_20~2013-05-20\_111437\_2614\_RGB
- DSM (I2154)
- DSM (I2153)
- DSM (I2152)
- 08e48z50\_31~2008-04-24\_091510\_40\_PAN\_L2\_0
- 08e48z50\_31~2008-04-24\_091521\_39\_PAN\_L2\_0
- 11o248ss50\_13~2011-06-27\_074156\_14\_HRA\_L2\_
- 11o248ss50\_13~2011-06-27\_074143\_13\_HRA\_L2\_
- 08e48z50\_31~2008-04-24\_091521\_39\_PSA\_L2\_08
- 08e48z50\_31~2008-04-24\_091510\_40\_PSA\_L2\_08

Opacity

E 664698.62 m N 6565311.44 m 61.13 m 1070.44 m 0.67 m

# 2011, DSM from point cloud



Keystone Console

System Project Window Help

varg hw\_private Auto UTM

Basic Registration Workset Job Portal Order Admin

Image catalogue Strip catalogue

World Wind Progress

Attributes

Select any combination of search attributes. Leave blank for any image.

ID

Name

Tag GRUSTAG,DSM

Platform

Instrument

Scene version

Strip

Collection

Clouds

Countries

Min resolution

Max resolution

State

Type

Geometry

ROI

Keyword

Time

Result (2)

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<input type="checkbox"/>	11o248ss50_13~2011-06-27_074156_14_HR4_L2_
<input type="checkbox"/>	11o248ss50_13~2011-06-27_074143_13_HR4_L2_
<input type="checkbox"/>	08e48z50_31~2008-04-24_091521_39_PSA_L2_08
<input type="checkbox"/>	08e48z50_31~2008-04-24_091510_40_PSA_L2_08

Opacity

E 664698.62 m N 6565311.44 m 61.13 m 1070.44 m 0.67 m

Keystone Console

System Project Window Help

varg hw\_private Auto UTM

Basic Registration Workset Job Portal Order Admin

Image catalogue Strip catalogue

World Wind Progress

Attributes

Select any combination of search attributes. Leave blank for any image.

ID

Name

Tag GRUSTAG,DSM

Platform

Instrument

Scene version

Strip

Collection

Clouds

Countries

Min resolution

Max resolution

State

Type

Geometry

ROI

Keyword

Time

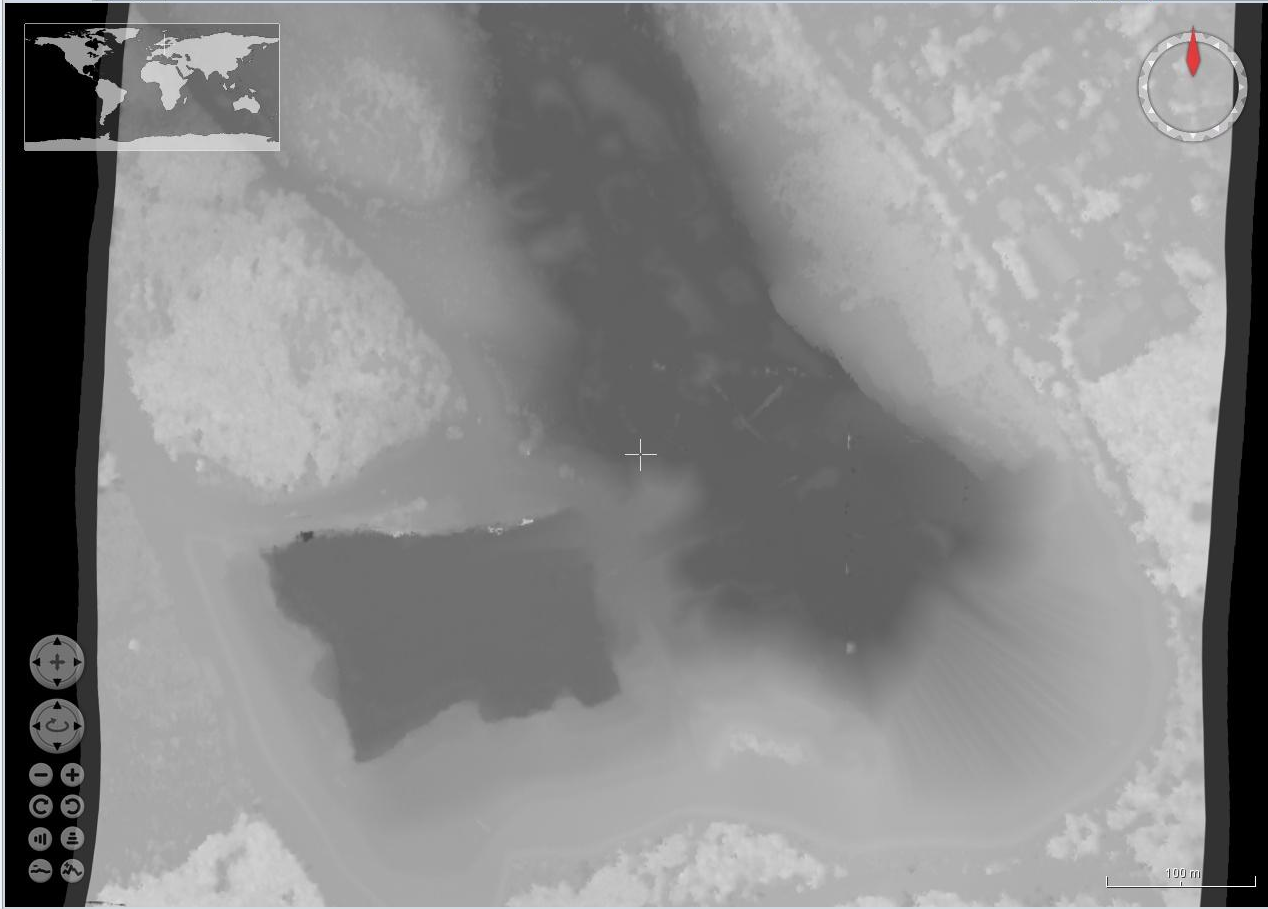
Result (2)

Name

- DSM (I2152)
- DSM (I2153)

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<input type="checkbox"/>	11o248ss50_13~2011-06-27_074143_13_HR4_L2_
<input type="checkbox"/>	08e48z50_31~2008-04-24_091521_39_PSA_L2_08
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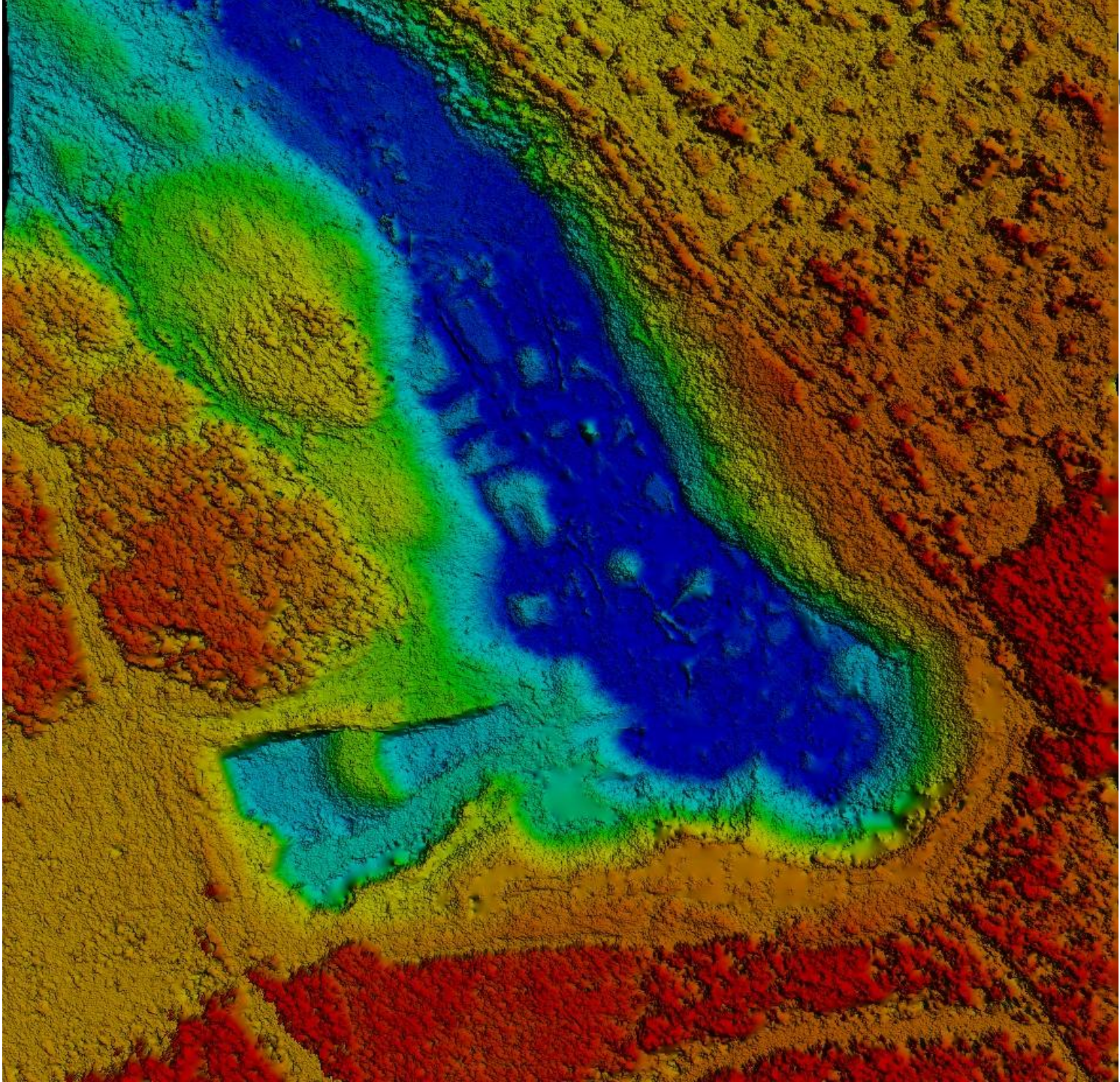
Opacity



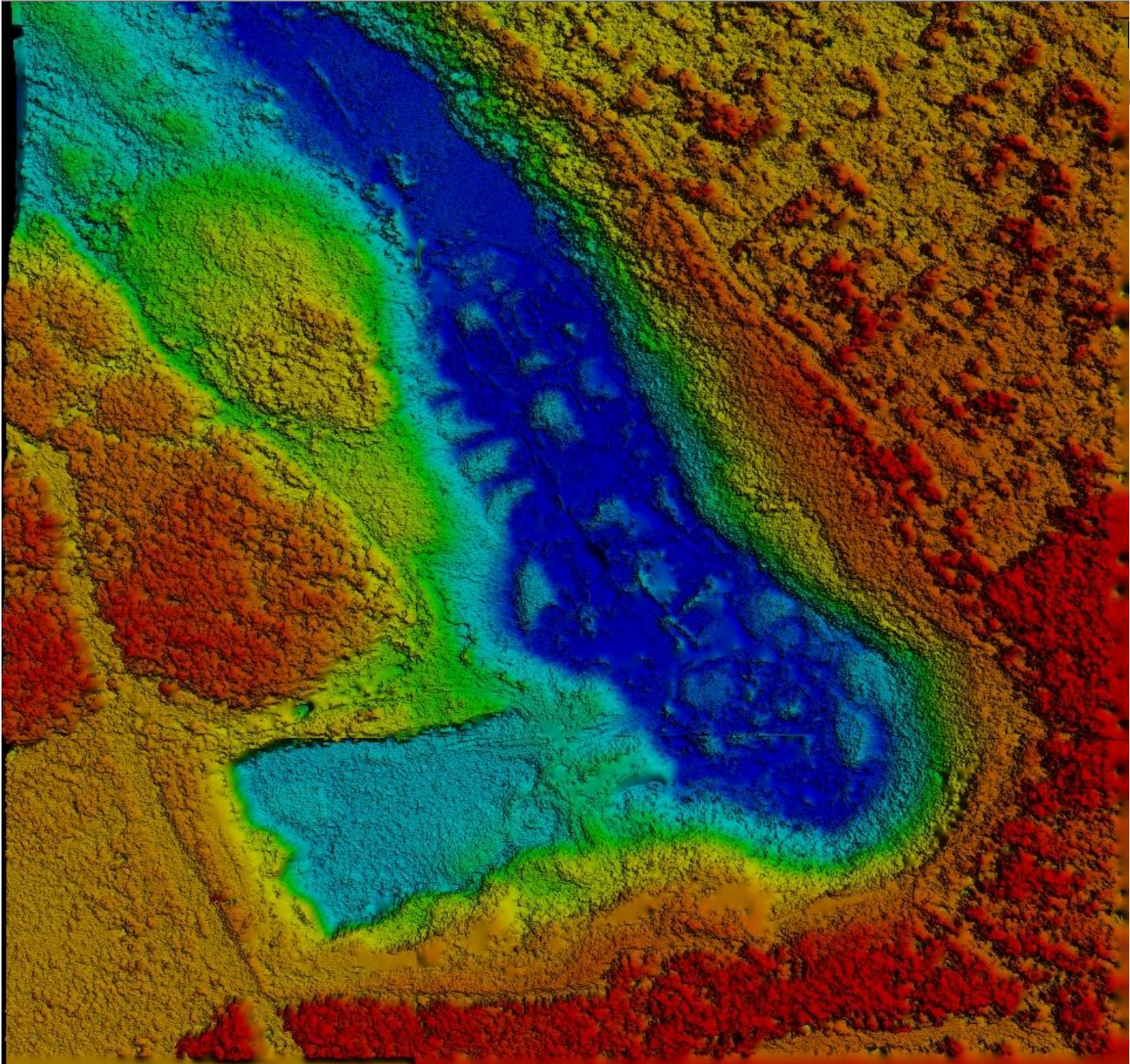
100 m

E 664698.62 m N 6565311.44 m 61.13 m 1070.44 m 0.67 m

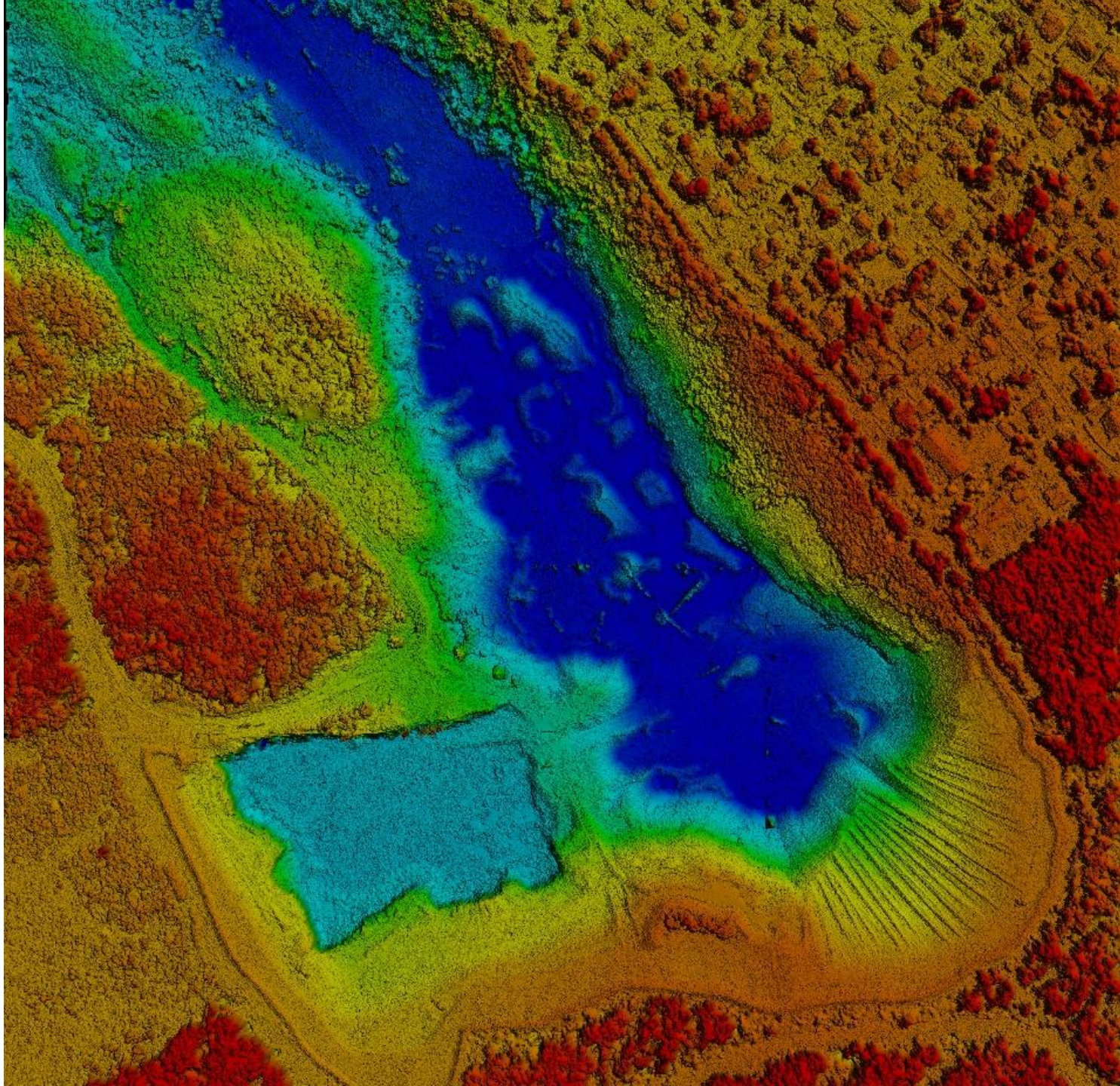




metric



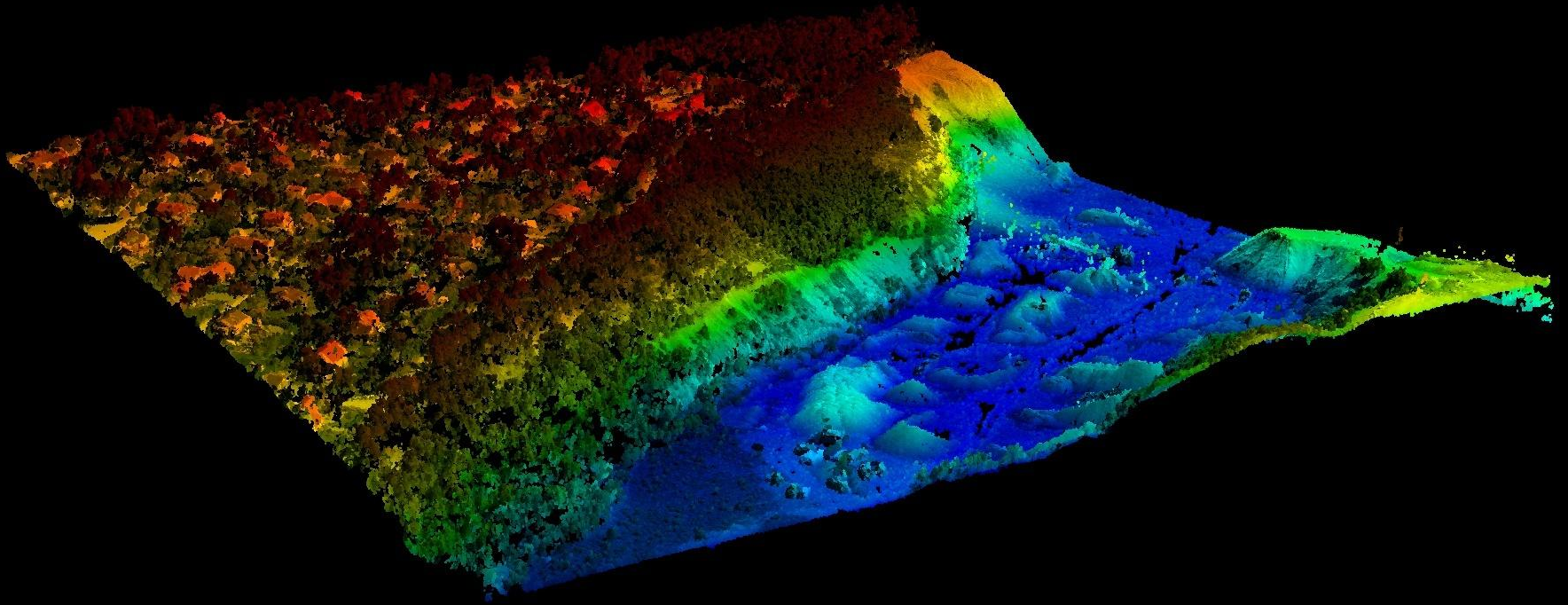
metric



metric

Quick Terrain Reader x64, v8.0.1 - [665000\_6565000.las]

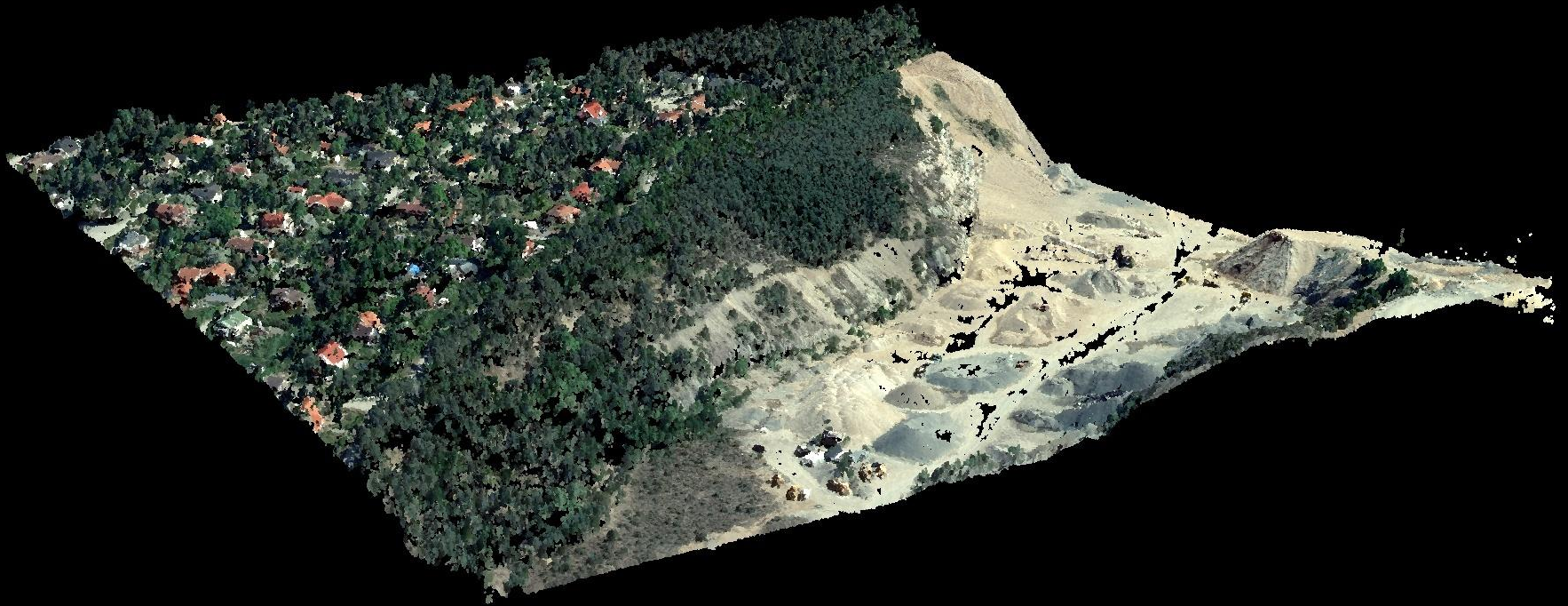
File Analysis Display Control Markers Upgrade Help



Targeted Point	SWEREF99 TM (metre)	N/A	N/A	0.0193 sec, 51.8 fps, 3,284,251 pts, LOD 0.25
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Quick Terrain Reader x64, v8.0.1 - [665000\_6565000.las]

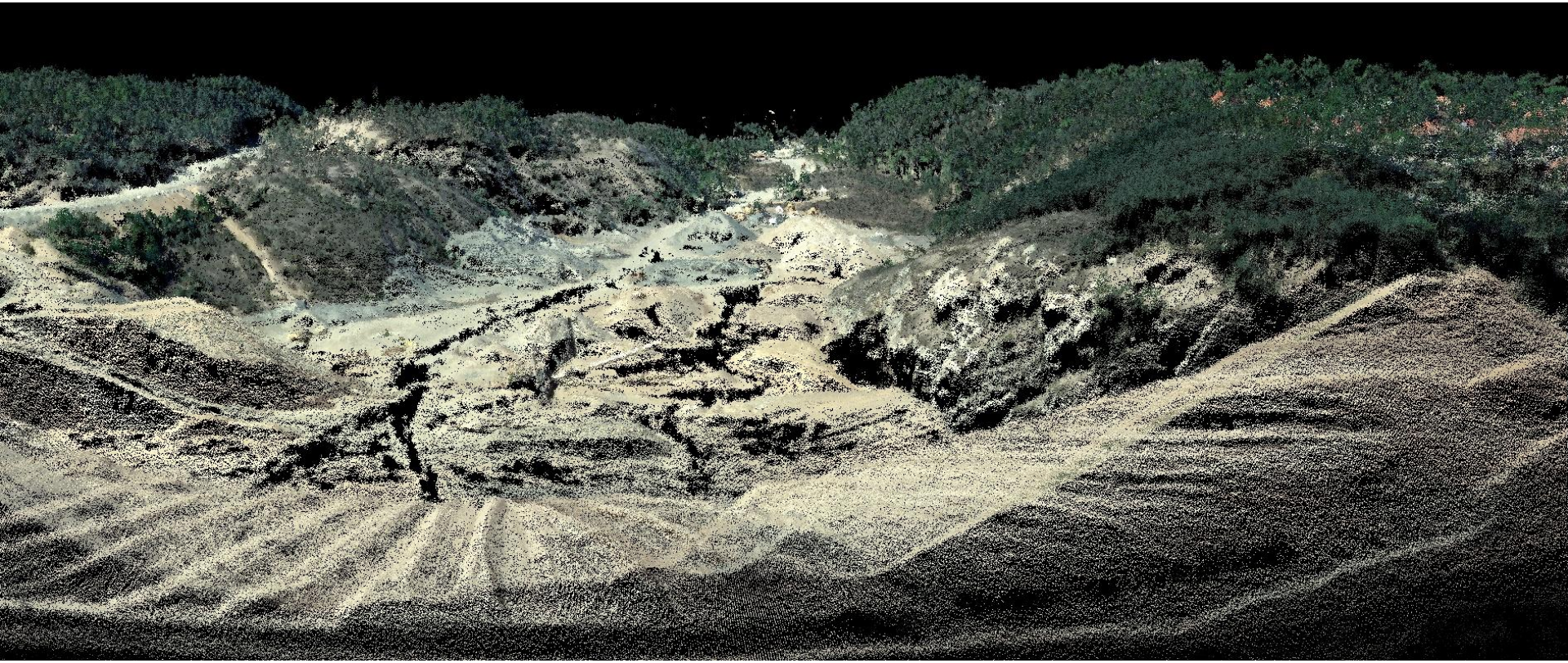
File Analysis Display Control Markers Upgrade Help

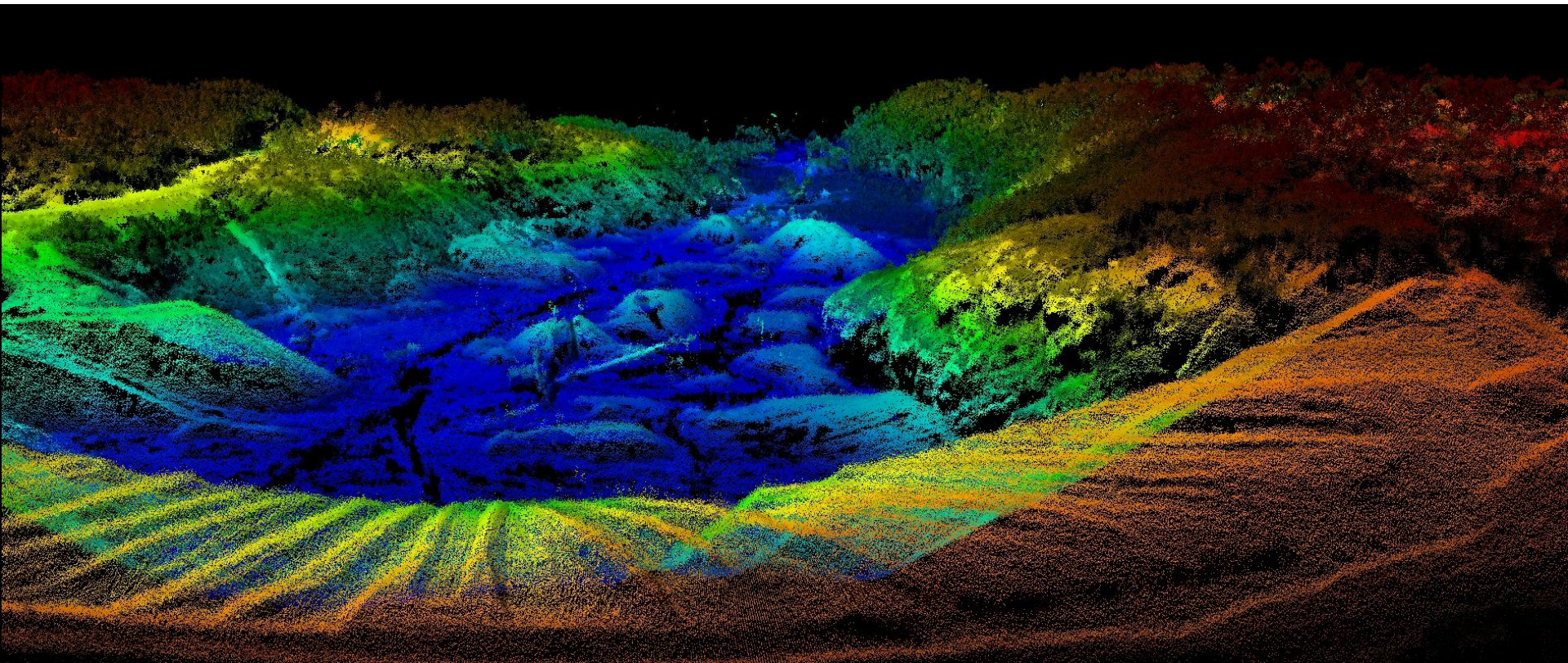


Targeted Point	SWEREF99 TM (metre)	N/A	N/A	0.0286 sec, 35.0 fps, 3,284,251 pts, LOD 0.25
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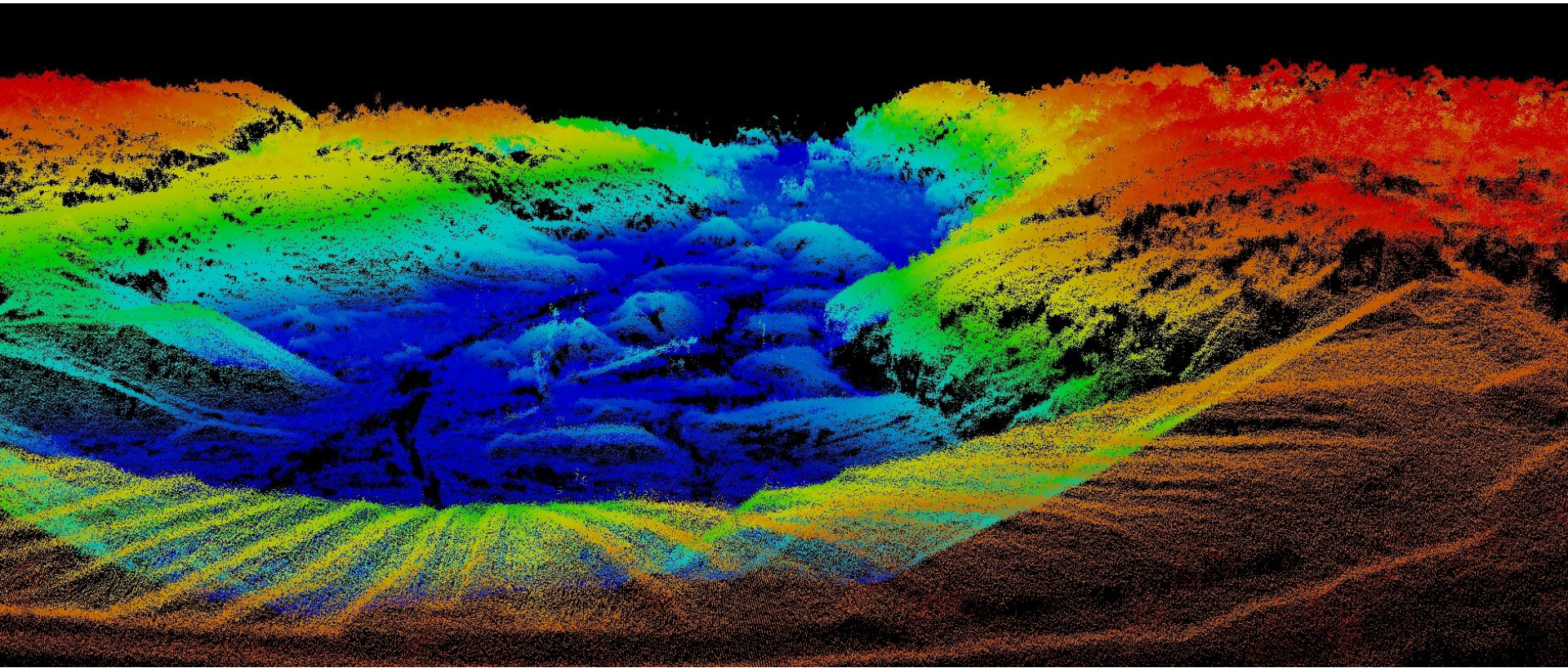
2013, similar view from point cloud



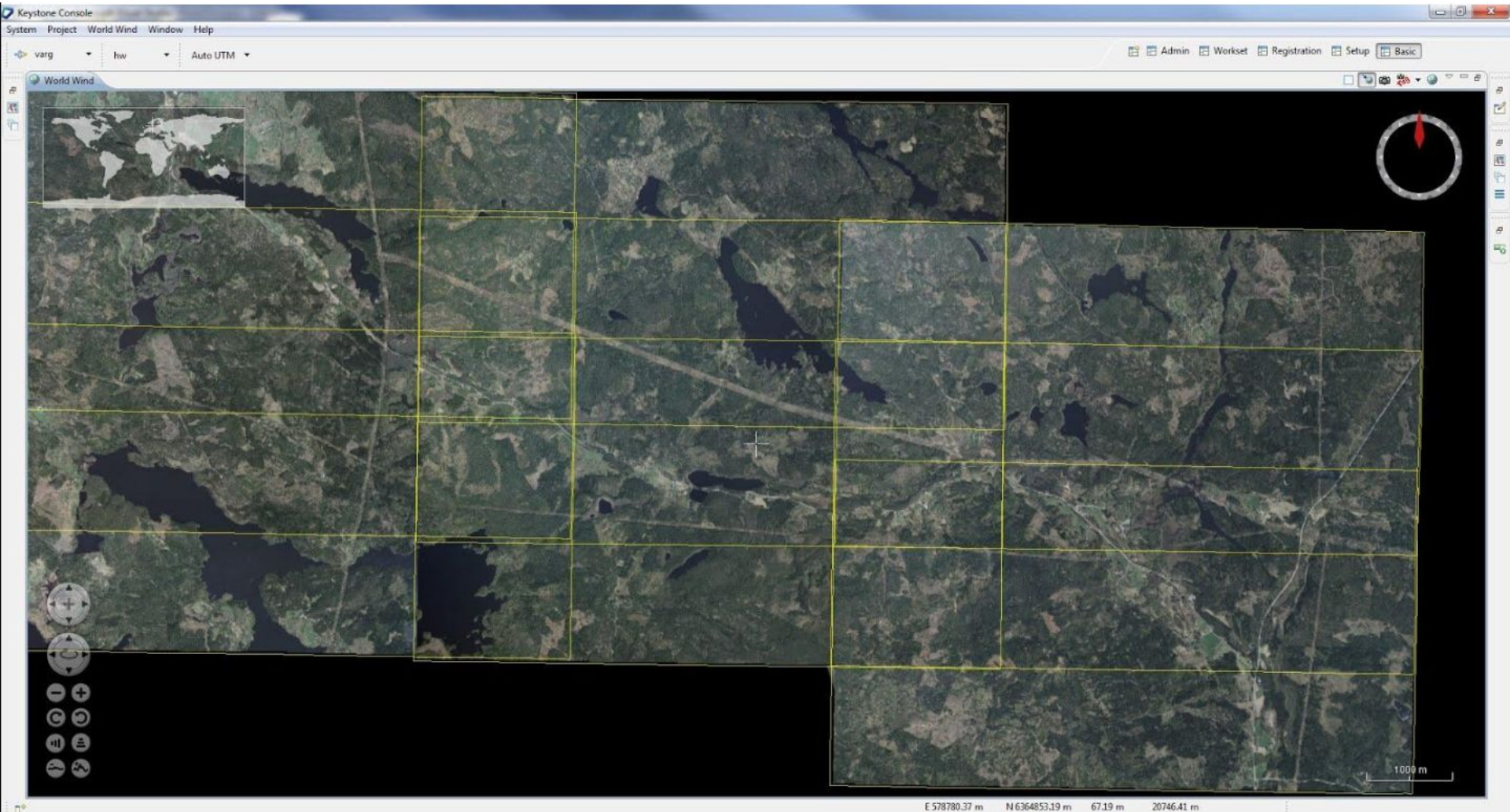




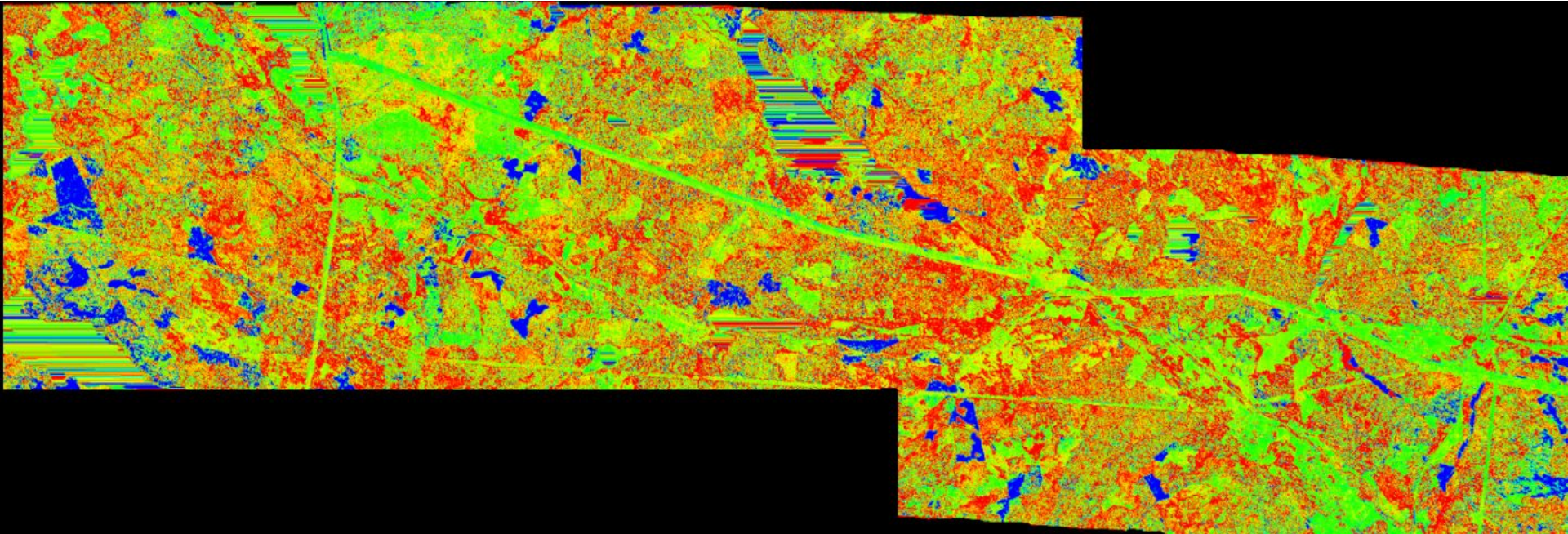
2013, color by height



# Förändringsanalys



# Förändringsanalys



Differenshöjder 2007 / 2011.

**Rött**=tillväxt,

**Grönt**=ingen förändring,

**Blått**=minskad höjd (hyggen)

The logo consists of a teal-colored arc that starts on the left and curves upwards and to the right, ending above the letter 'S'.

# Spacemetric

Image management solutions for satellite and airborne sensors