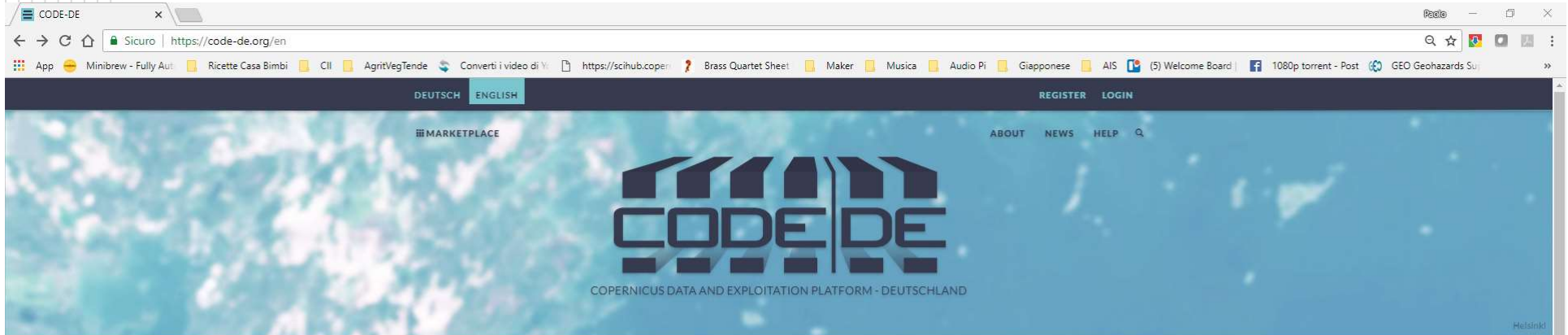


**Updates on
SAR trends in Europe,
sarmap & SARscape**

Sentinel-1 national and partial mirrors

		Full	Services / tools	API
Australia National Mirror	1,2,3	No	No	Own
Austria National Mirror	1,2,3	Yes	No	Standard
Finland National Mirror	1,2,3	Yes	No	Standard
France National Mirror (PEPS)	1,2,3	Yes	No	Own
Germany National Mirror (CODE-DE)	1,2	Yes	Yes	Own
Greece National Mirror	1,2,3	No	Yes	Standard
Italy National Mirror	1,2,3	Yes	No	Standard
Norway National Mirror	1,2,3	Yes	No	Standard
Portugal National Mirror	1,2,3	Yes	No	Own
United Kingdom National Mirror (SEDAS)	1,2	30d	Yes	Own
Alaska Satellite Facility	1	Yes	Yes	Own
Centre for Environmental Data Analysis - CEDA	1,2,3	No	No	Own

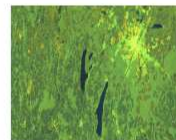
Sentinel national mirrors



The Copernicus Data and Exploitation Platform - Deutschland (CODE-DE) is the German entry point to the Sentinel Satellite Systems, their data products and the products of the Copernicus Services.

[read more >](#)

Featured Content



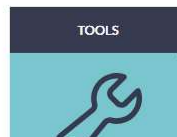
Sentinel-1



Sentinel-2



Sentinel-3



CODE-DE

Sicuro | <https://code-de.org/en/marketplace/search?filter%5B0%5D=type%3Adataset>

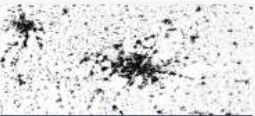

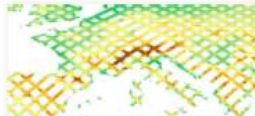






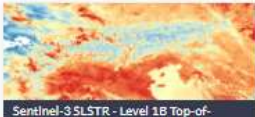
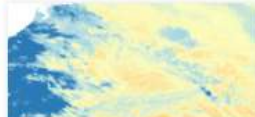


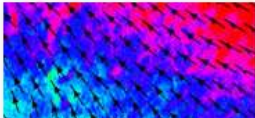



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ALL DATASET SERVICE PROJECT TOOL PROCESSOR + ADD A NEW DATASET

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1-17 of 17

 <p>Global Urban Footprint (GUF) - TSX/TDX - global</p>	 <p>RapidEye Science Archive (RESA) - Level 3M Mosaic - Germany, 2015</p>	 <p>SRTM X-SAR - Elevation Mosaic - Global</p>	 <p>SRTM X-SAR - Elevation Error Mosaic - Global</p>
 <p>SRTM X-SAR - Hillshade Mosaic - Global</p>	 <p>SRTM X-SAR - Color-Coded Elevation Mosaic - Global</p>	 <p>Sentinel-2 MSI - Maritime Product - Regional</p>	 <p>MODIS - Image Mosaic - Germany</p>
 <p>Sentinel-3 OLCI - Level 1B Top-of-Atmosphere Radlance</p>	 <p>Sentinel-3 SLSTR - Level 1B Top-of-Atmosphere Radlance and Brightness Temperature</p>	 <p>Sentinel-3 SLSTR - Level 2 Land Product</p>	 <p>Sentinel-3 OLCI - Level 2 Land Product</p>
 <p>Sentinel-2 MSI - Level 1C Top-of-Atmosphere Reflectance</p>	 <p>Sentinel-1 SAR - Level 2 Ocean Product</p>	 <p>Sentinel-1 SAR - Level 1 Single-Look Complex</p>	 <p>Sentinel-1 SAR - Level 1 Ground Range Detected</p>
 <p>Sentinel-2 MSI - Temporal Feature Extraction Product - Germany</p>			

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- Copernicus Services Portfolio
- Copernicus Land Monitoring Service
- Copernicus Marine Environment Monitoring Service
- Copernicus Atmosphere Monitoring Service
- Copernicus Emergency Management Service
- Copernicus Climate Change Service

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SUBJECT

MESSAGE

YOUR NAME

YOUR E-MAIL ADDRESS

SEND MESSAGE

Bundesministerium CODE-DE



CODE-DE

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MESSAGE YOUR E-MAIL ADDRESS


SEND MESSAGE


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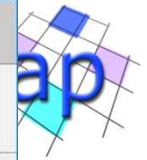
 GAFAG

 BROCKMANN CONSULT GMBH

 T-Systems

 EOMAP

 werum
SOFTWARE & SYSTEMS



Paolo

CODE-DE

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1-19 of 19

 TIMESAT A software package to monitor the evolution of satellite sensor data	 Sen2Cor	 Fmask (Python)	 ARTMO
 QGIS	 POLARPRO	 SAGA GIS	 Fmask (standalone / Matlab code)
 brat Broadview Radar Altimetry Toolbox	 Sen2Three	 CODE-DE User Tools @ github	 ESA Sentinel Application Platform
 ORFEO ToolBox	 GRASS GIS	 GDAL/OGR	 ESA Sentinel App
 Generic Mapping Tools (GMT)	 Sentinel-2 Radiometric Uncertainty Tool	 ArcGIS Sentinel-2 Download Tools	

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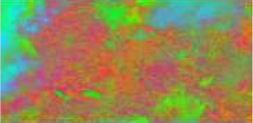
MARKETPLACE ABOUT NEWS HELP

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1-4 of 4



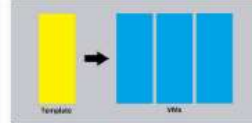
SNAP Generic BandMath



Sen2Cor



Calvalus



VM Template

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EOMAP



werum SOFTWARE & SYSTEMS



Copernicus Data and Information Access Services (DIAS)

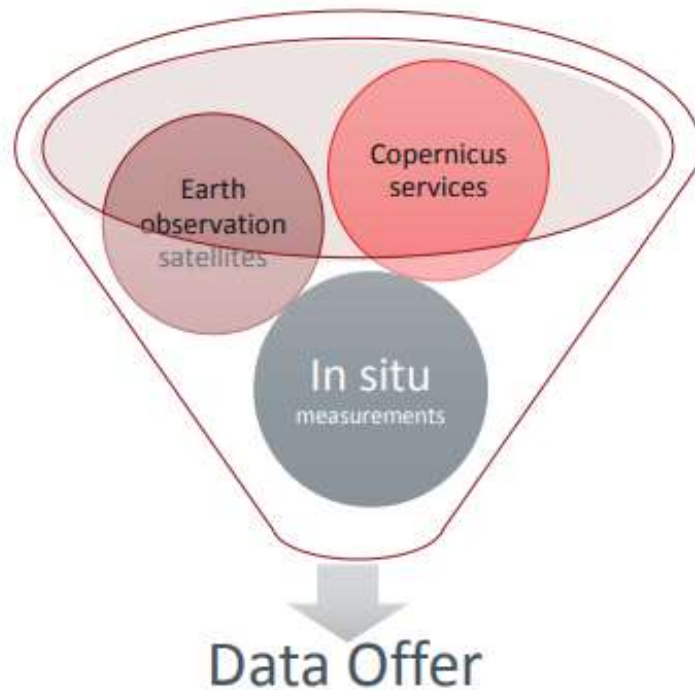
- Consortium led by SERCO with OVH as cloud provider;
- Consortium led by CREOTECH INSTRUMENTS with CLOUDFERRO as cloud provider;
- Consortium led by ATOS INTEGRATION with T-SYSTEM INTERNATIONAL as cloud provider;
- Consortium led by AIRBUS DEFENCE AND SPACE with ORANGE as cloud provider.



From left to right: Grzegorz Brona (Creotech), Philippe Brunet (European Commission), Roberto Mulatti (SERCO), Josef Aschbacher (ESA), Mathilde Royer Germain (Airbus) and Stéphane Janichewski (ATOS)

Data Offer: Storage Content Delivery

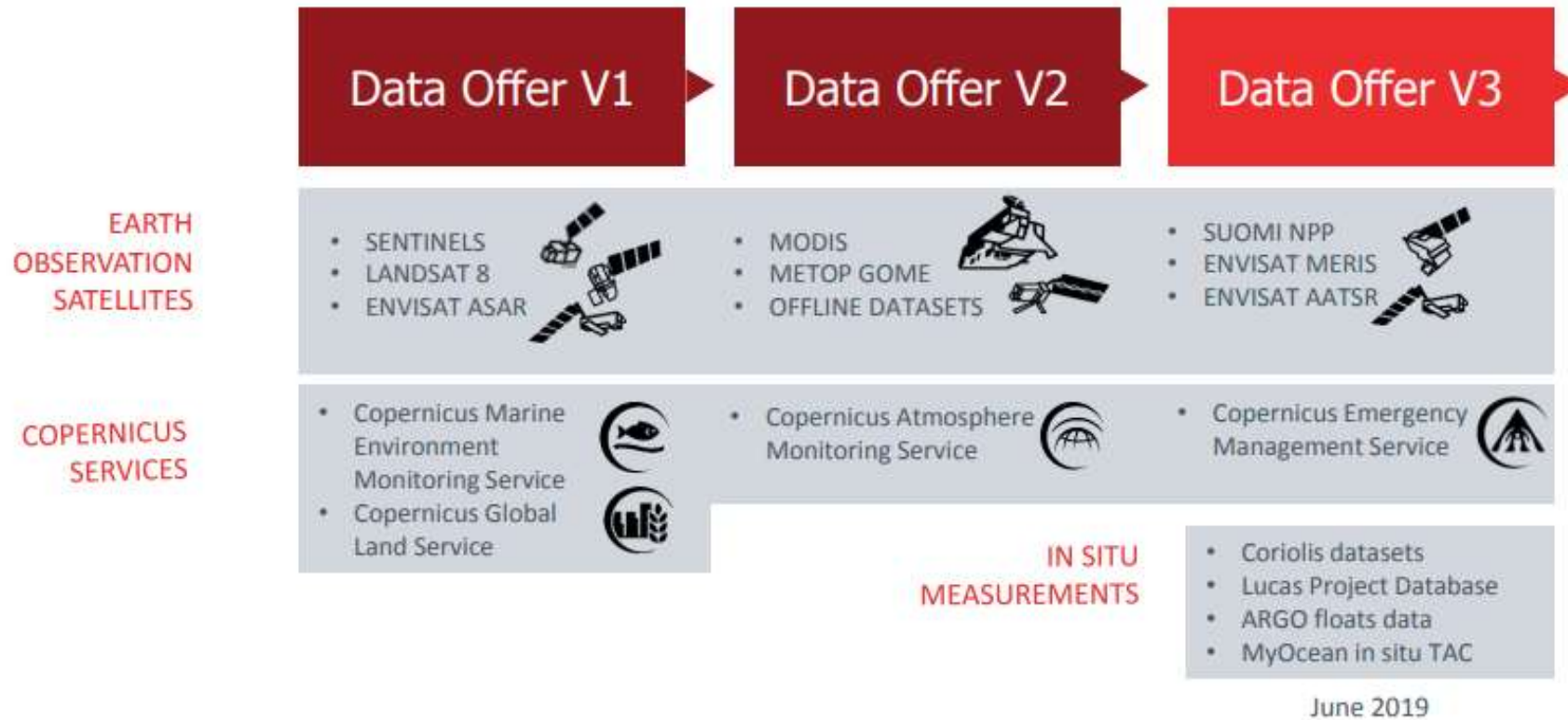
Our Data Offer integrates data collections from different sources



Committed offer: 2 years of Sentinels on-line

Our ambition: no rolling archive thanks to our Innovation Funding Programme

Data Offer: Storage Content Delivery



Services Offer

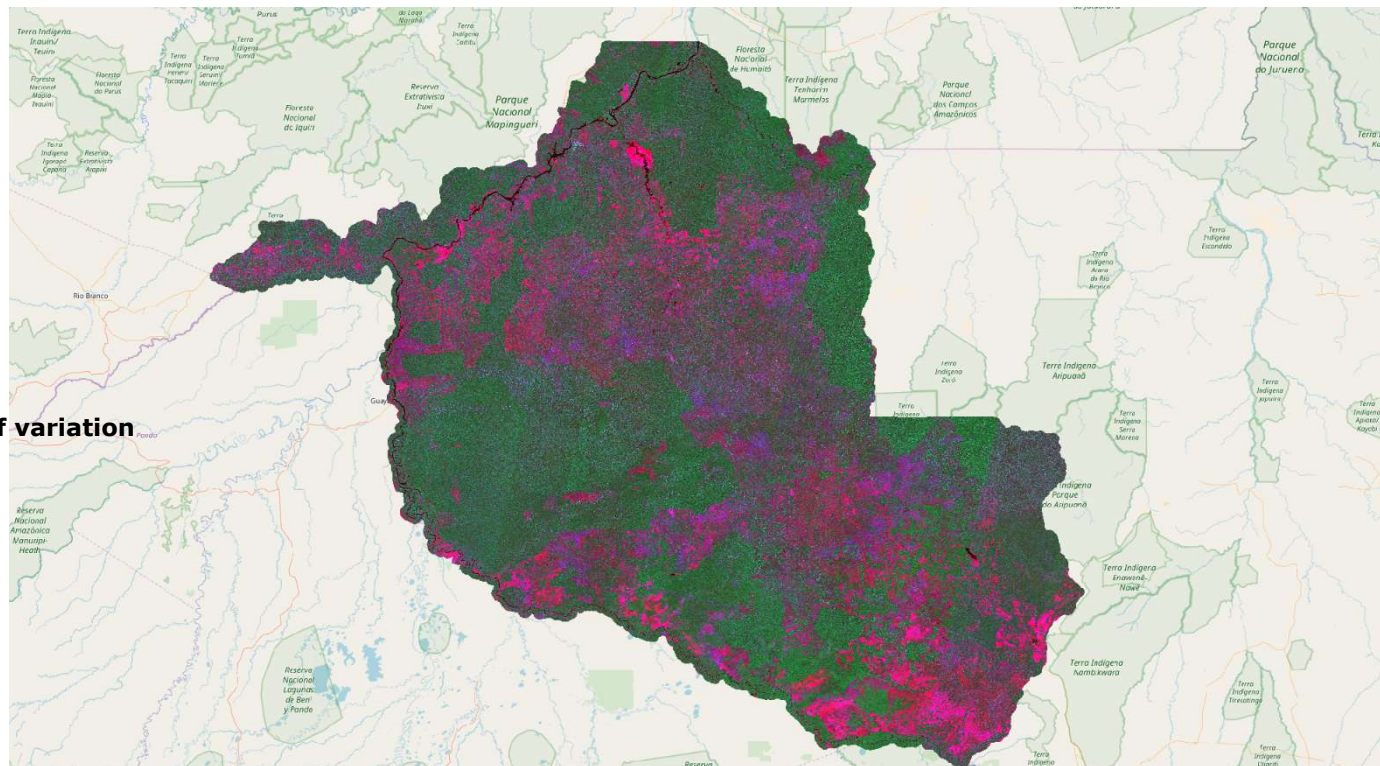
The image displays a grid of service icons on a dark blue background with a grid pattern. The grid is divided into two main sections: 'Free of Charge Services' and 'Fee based Services'. Each section contains four red square icons with white symbols and text labels.

Free of Charge Services		Fee based Services	
 User Services	 Discovery	 Infrastructure as a Service	 Kick Start templates for fast deployment
 View	 Download	 Advanced API	 Managed Engineering Services

And now.....

...a little demo!

Rondônia 9/2016 to 5/2017



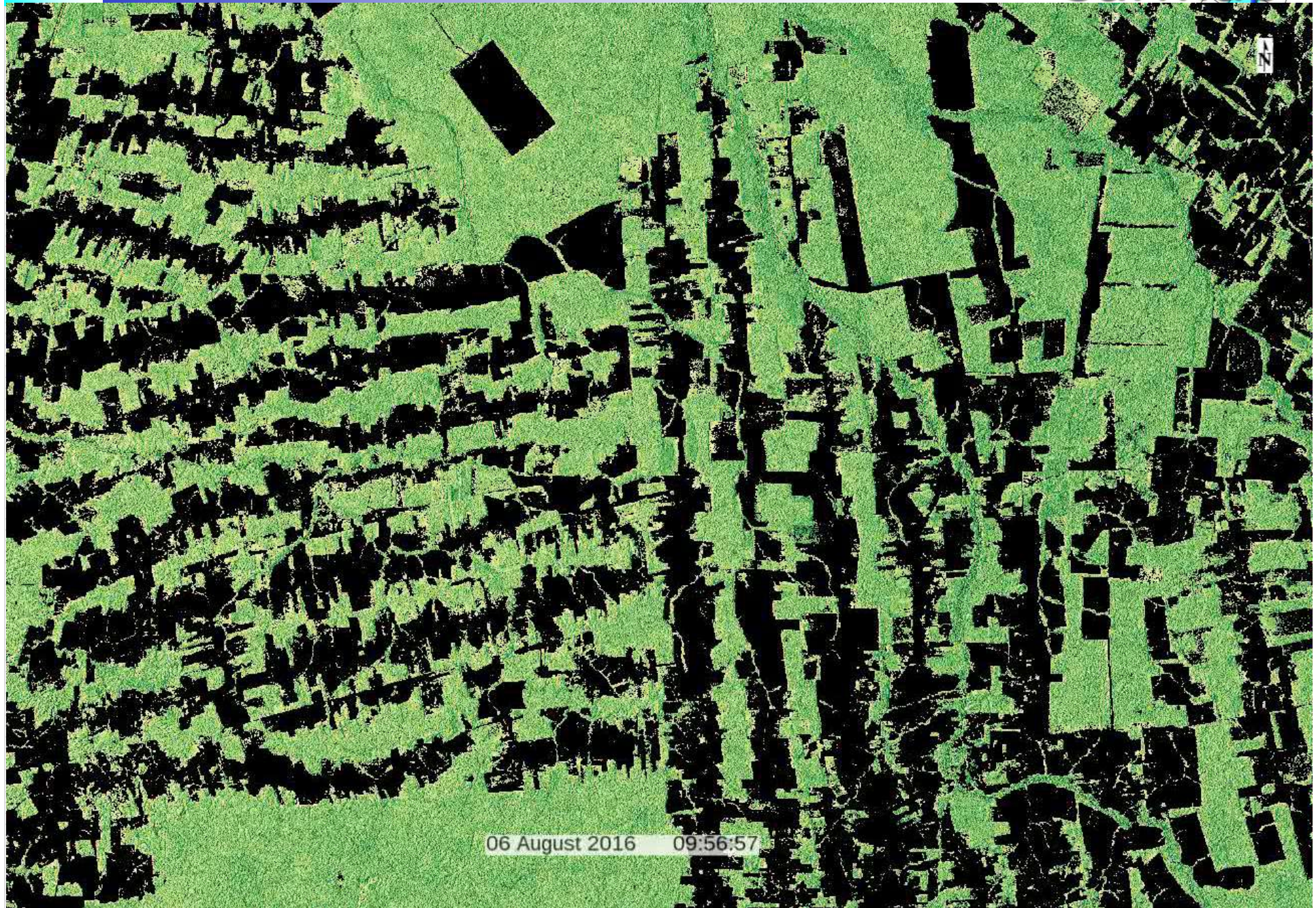
- Coefficient of variation
- Mean
- Gradient

300 x 13 frames

Rondônia (Porto Velho) weather (wikipedia)

Climate data for Porto Velho (1961–1990)													[hide]
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Record high °C (°F)	37.2 (99)	36.4 (97.5)	38.7 (101.7)	37.1 (98.8)	36.8 (98.2)	38.8 (101.8)	37.9 (100.2)	40.9 (105.6)	39.4 (102.9)	40.0 (104)	39.7 (103.5)	38.0 (100.4)	40.9 (105.6)
Average high °C (°F)	31.3 (88.3)	31.5 (88.7)	31.7 (89.1)	31.6 (88.9)	31.6 (88.9)	31.7 (89.1)	32.7 (90.9)	34.3 (93.7)	34.0 (93.2)	33.3 (91.9)	32.6 (90.7)	31.6 (88.9)	32.3 (90.1)
Daily mean °C (°F)	25.5 (77.9)	25.5 (77.9)	25.6 (78.1)	25.7 (78.3)	25.3 (77.5)	24.7 (76.5)	24.6 (76.3)	25.9 (78.6)	26.2 (79.2)	26.1 (79)	26.0 (78.8)	25.5 (77.9)	25.6 (78.1)
Average low °C (°F)	21.7 (71.1)	21.8 (71.2)	21.8 (71.2)	21.9 (71.4)	21.0 (69.8)	19.2 (66.6)	18.3 (64.9)	19.0 (66.2)	20.8 (69.4)	21.8 (71.2)	22.0 (71.6)	22.0 (71.6)	20.9 (69.6)
Record low °C (°F)	14.4 (57.9)	15.4 (59.7)	12.0 (53.6)	12.8 (55)	12.0 (53.6)	11.8 (53.2)	7.4 (45.3)	10.0 (50)	12.1 (53.8)	17.7 (63.9)	18.1 (64.6)	11.0 (51.8)	7.4 (45.3)
Average rainfall mm (inches)	320.9 (12.634)	316.0 (12.441)	273.9 (10.783)	251.0 (9.882)	126.6 (4.984)	49.2 (1.937)	24.2 (0.953)	36.4 (1.433)	119.9 (4.72)	192.7 (7.587)	225.2 (8.866)	319.1 (12.563)	2,255.1 (88.783)
Average rainy days (≥ 1.0 mm)	19	19	20	17	11	4	3	4	11	13	16	19	156
Average relative humidity (%)	89	88	89.1	89	86	82.1	80	82	84	86	87	88.7	86.1
Mean monthly sunshine hours	107.1	98.3	124.0	140.1	183.7	226.7	259.7	234.0	186.8	166.7	137.1	124.2	1,988.4

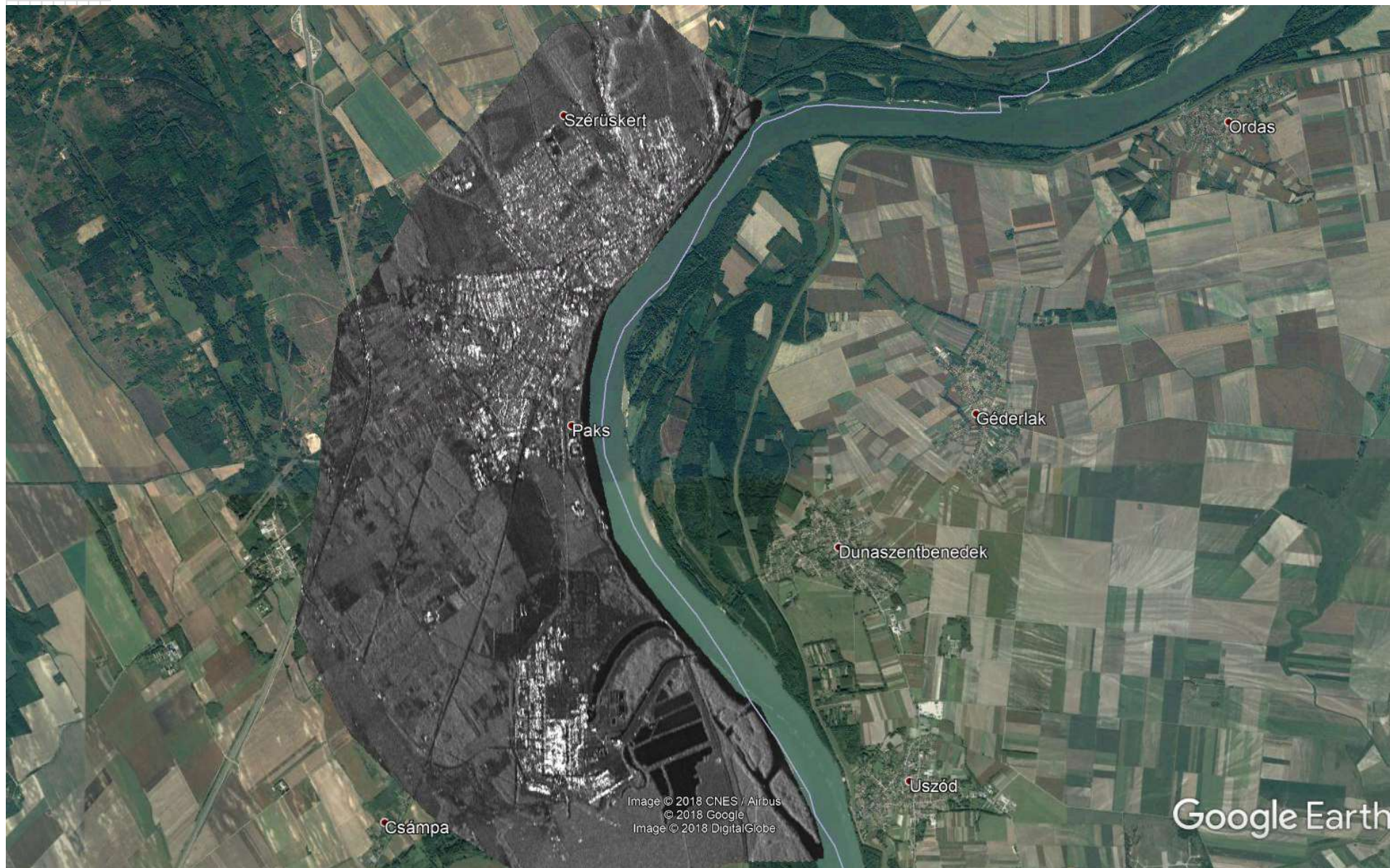
Source: Brazilian National Institute of Meteorology (INMET).^{[2][6][7][3][8]9[10][5][4]}



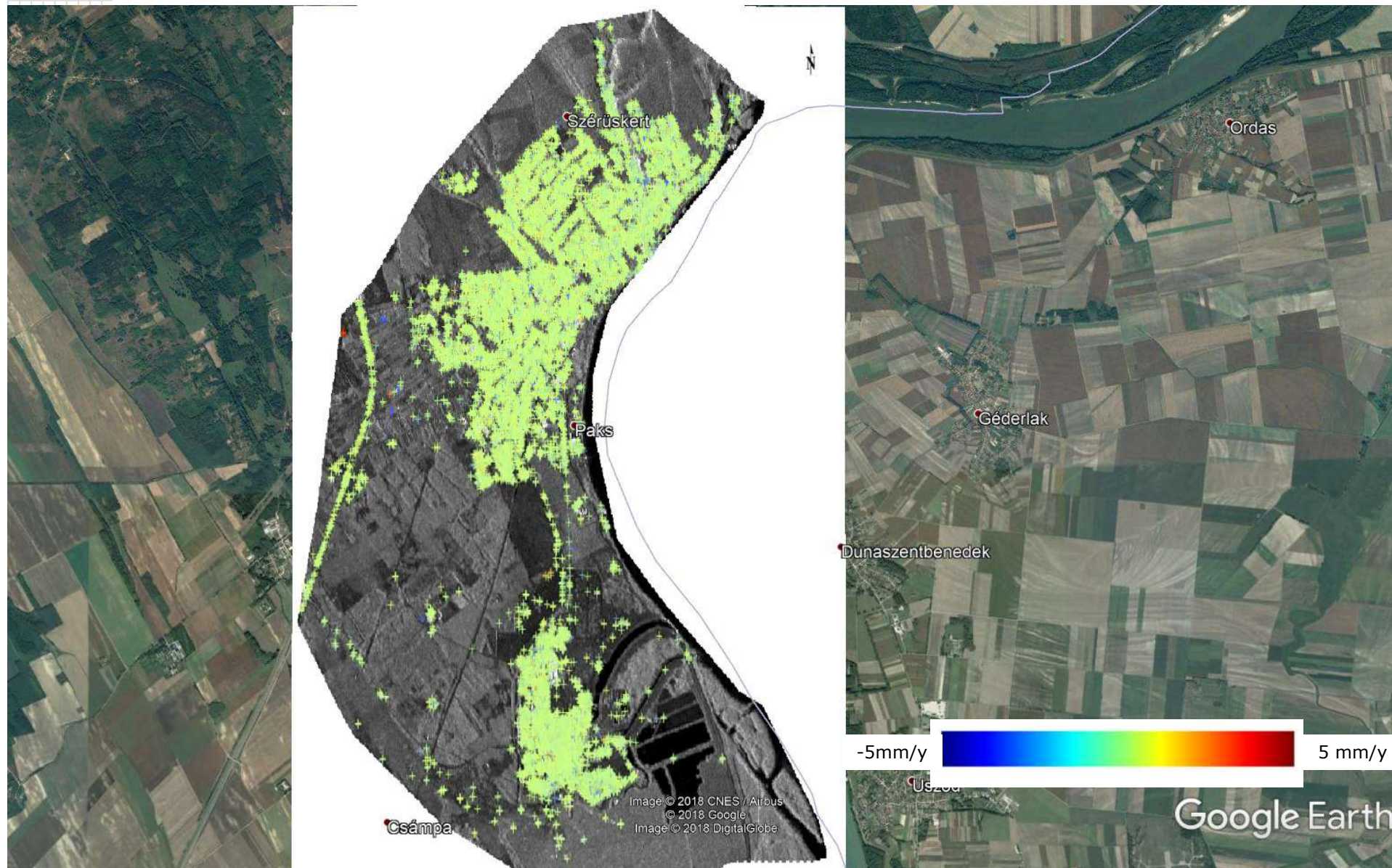
Paks nuclear plant



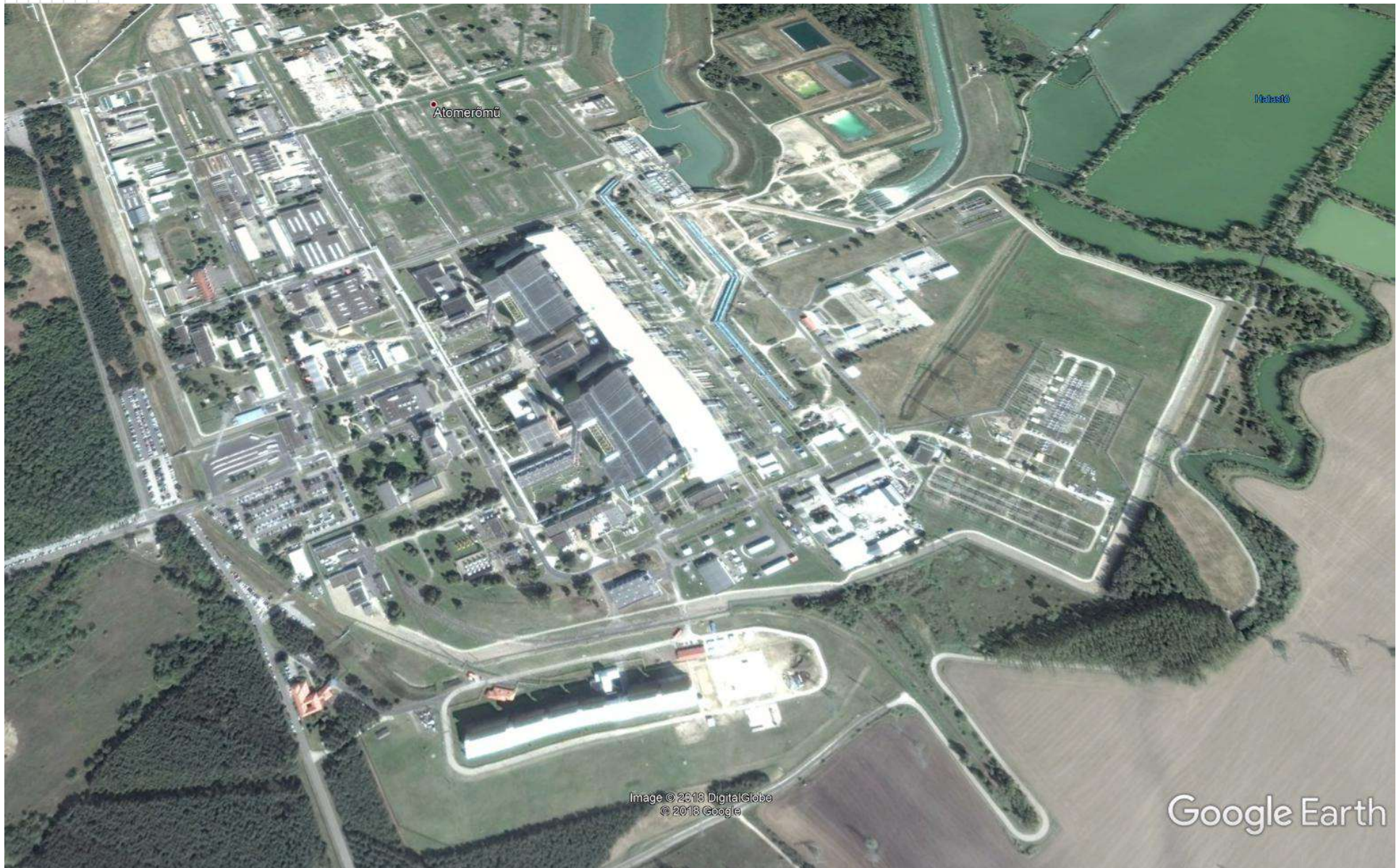
Paks nuclear plant



Paks nuclear plant



Paks nuclear plant



Paks nuclear plant

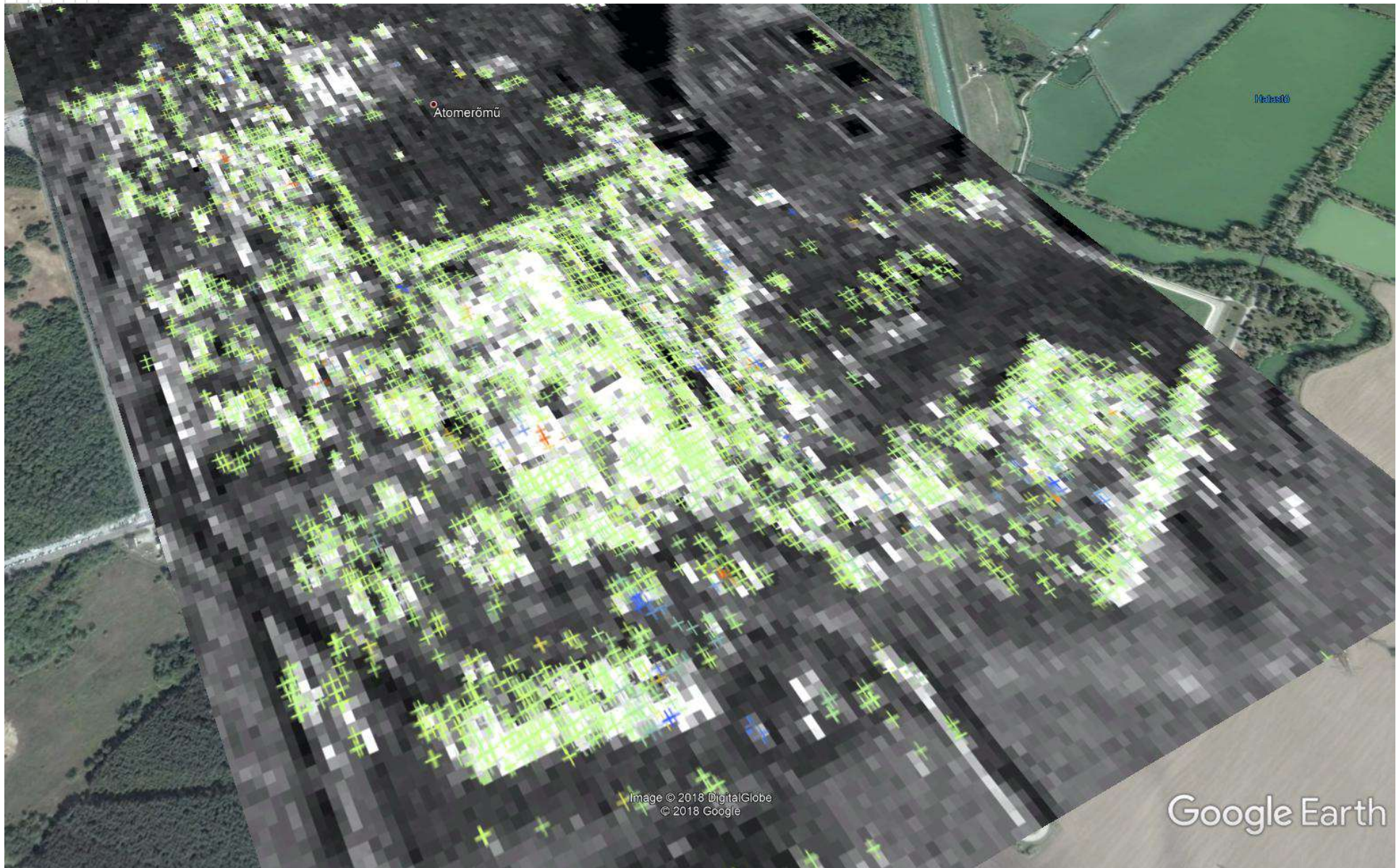
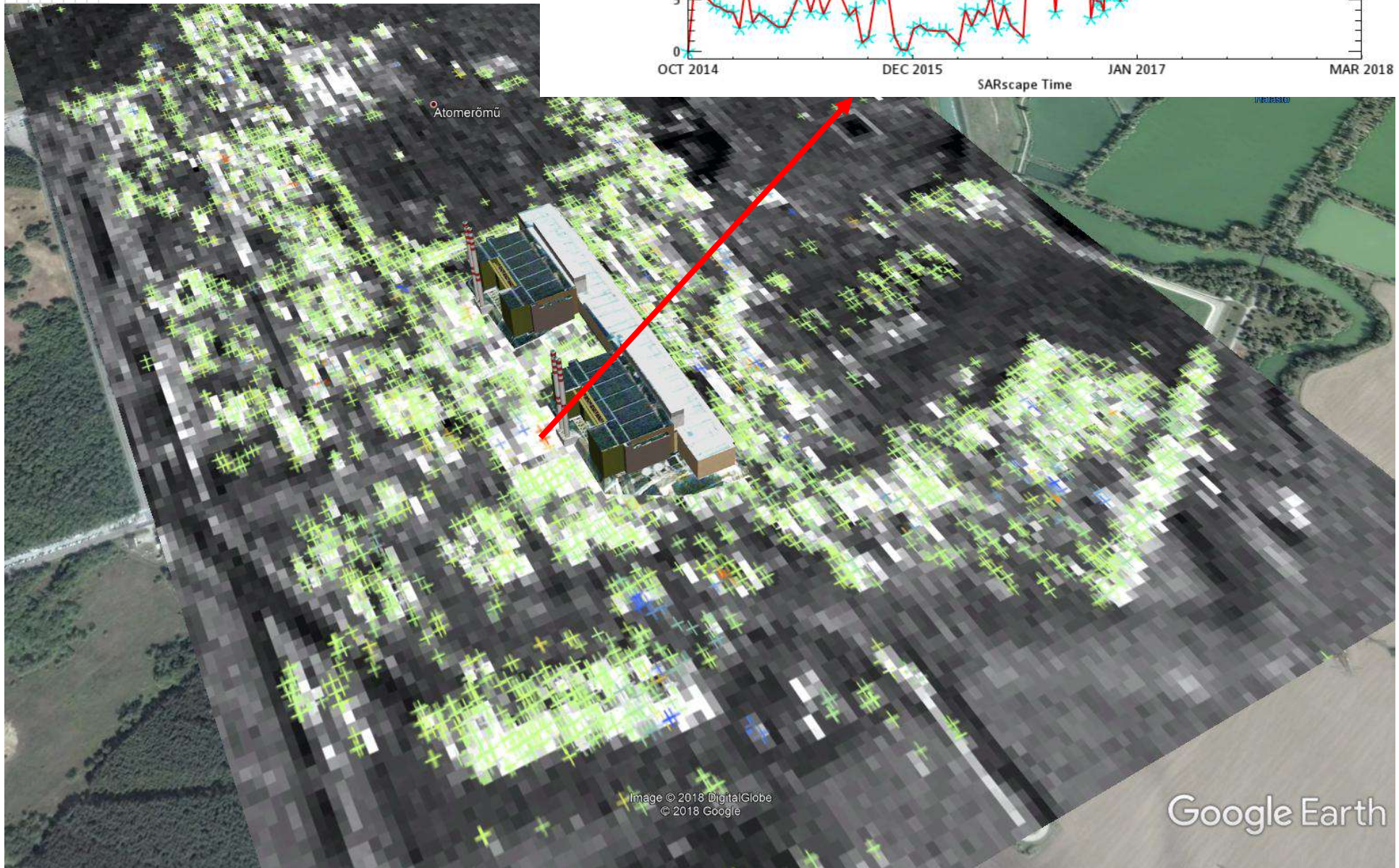
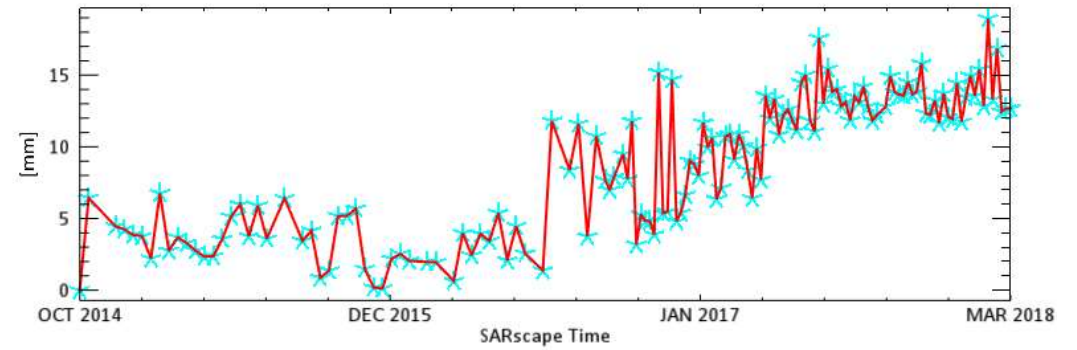


Image © 2018 DigitalGlobe
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Google Earth

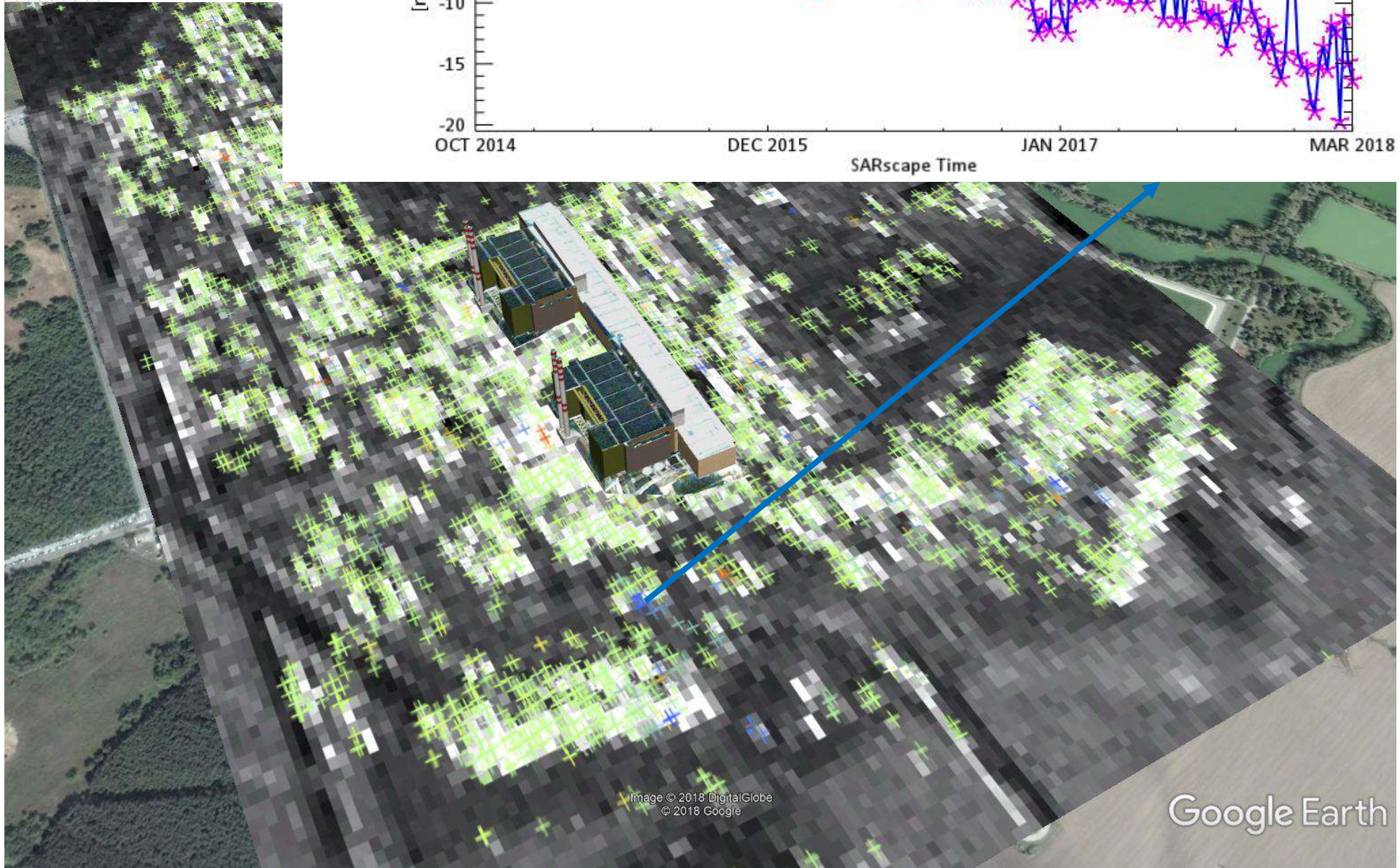
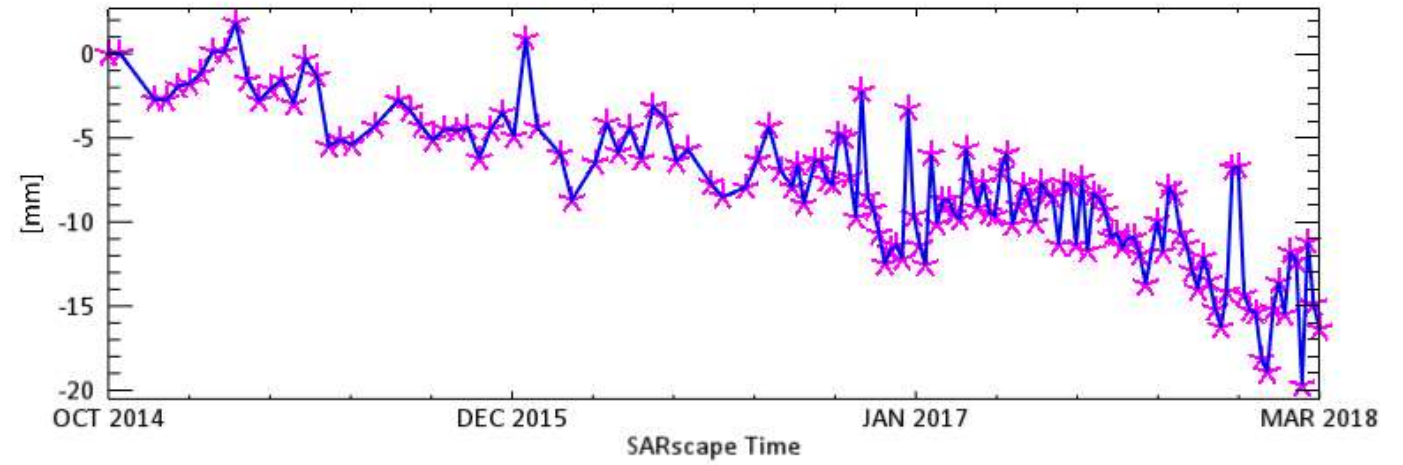
updates

Paks nuclear plant



updates

Paks nu



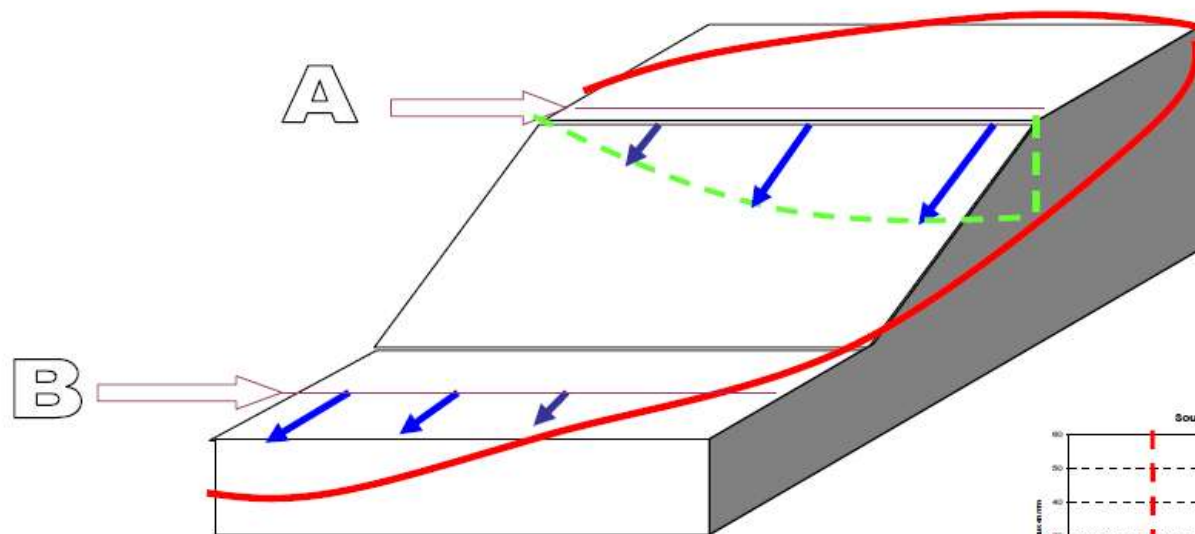
Railway monitoring



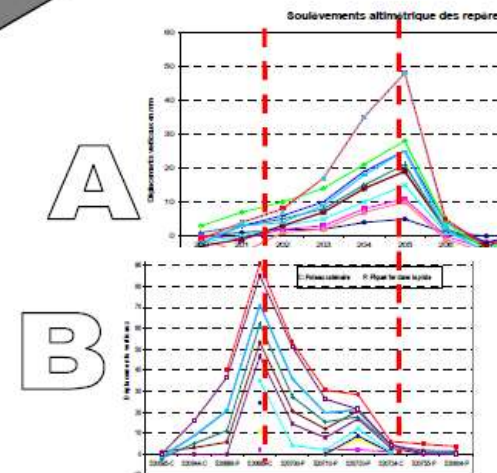
PARIS

MARSEILLE

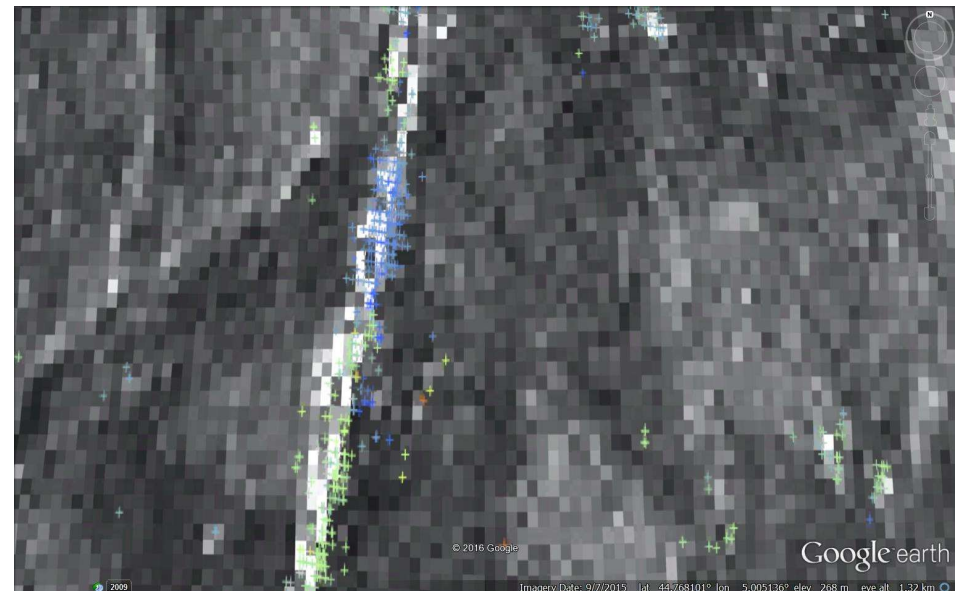
Géométrie du glissement




 Vecteur déplacement du glissement perpendiculaire à l'axe de la plateforme

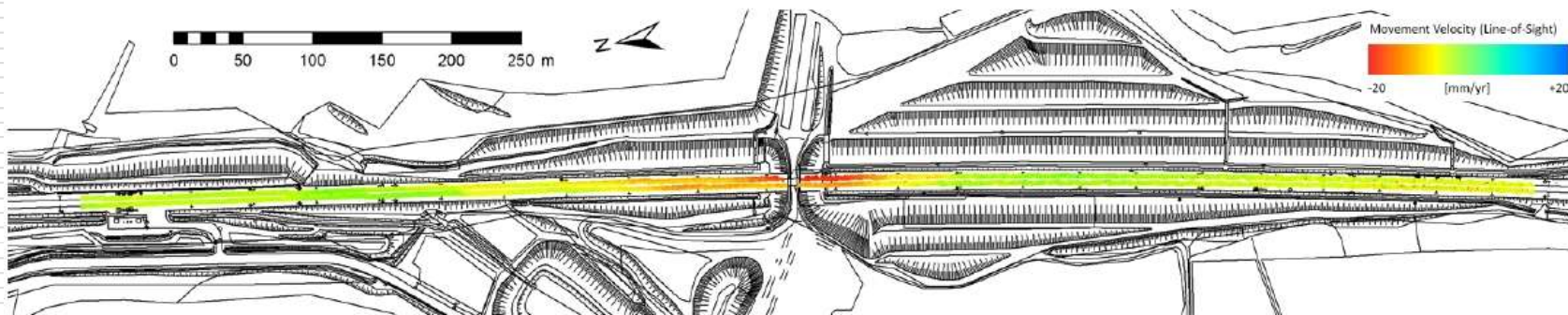
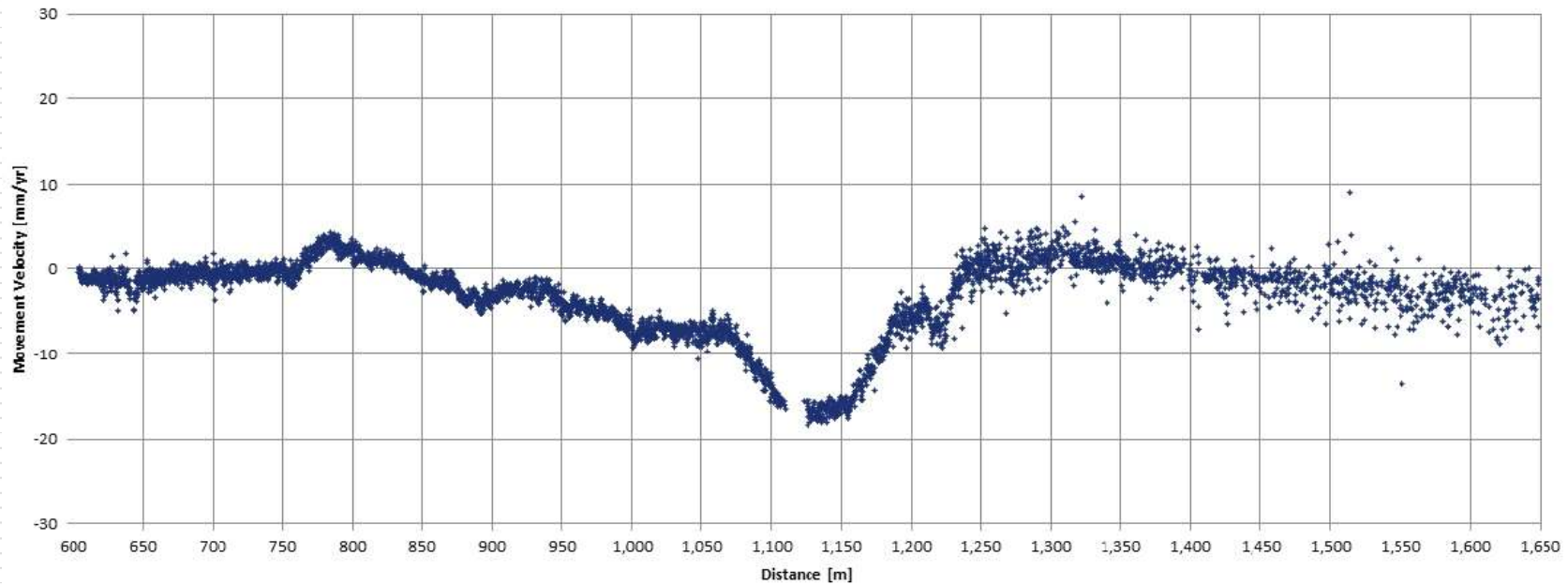


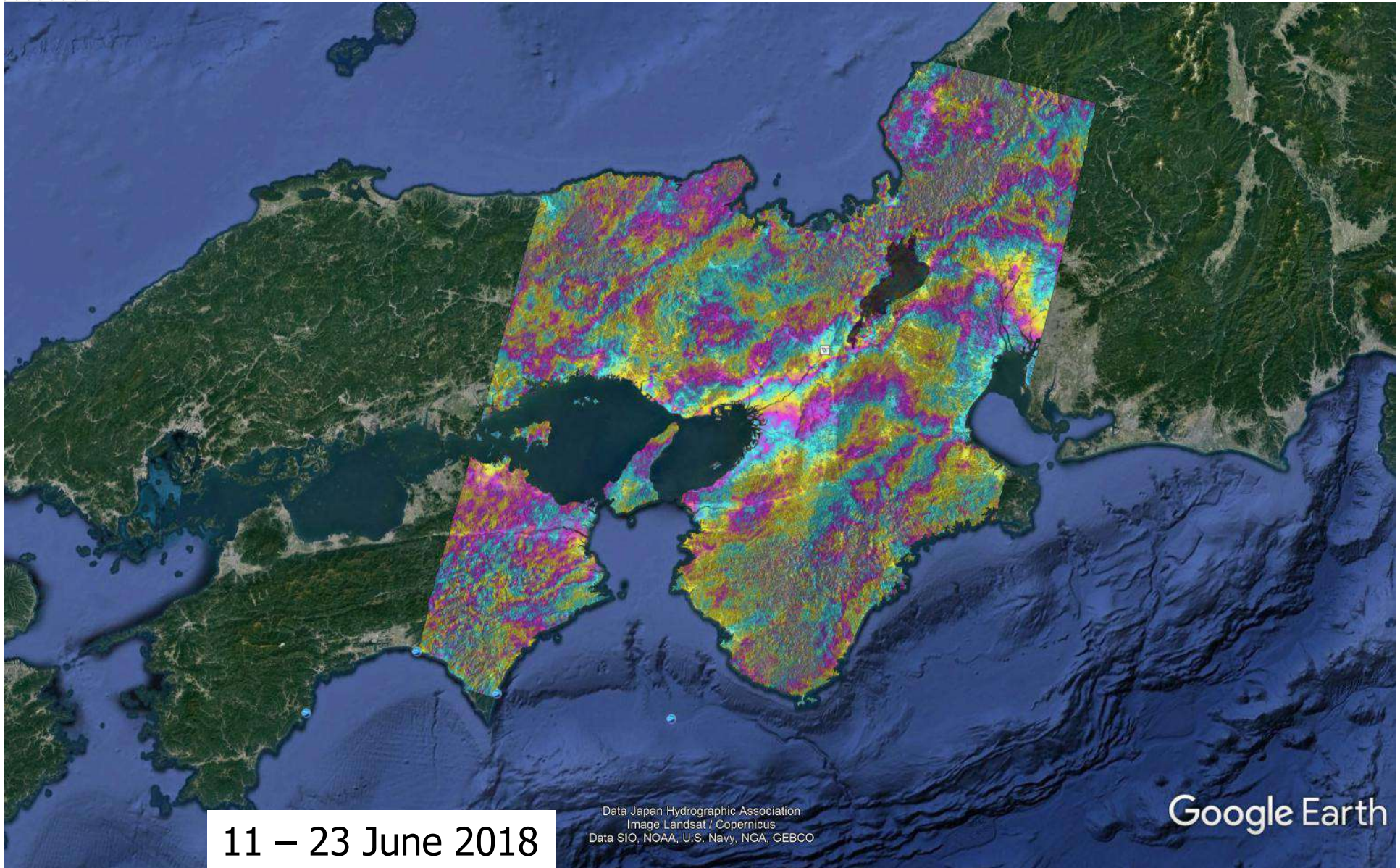
Railway monitoring with Sentinel-1



...and when the going gets tough.....

Movement Velocity Rail 3





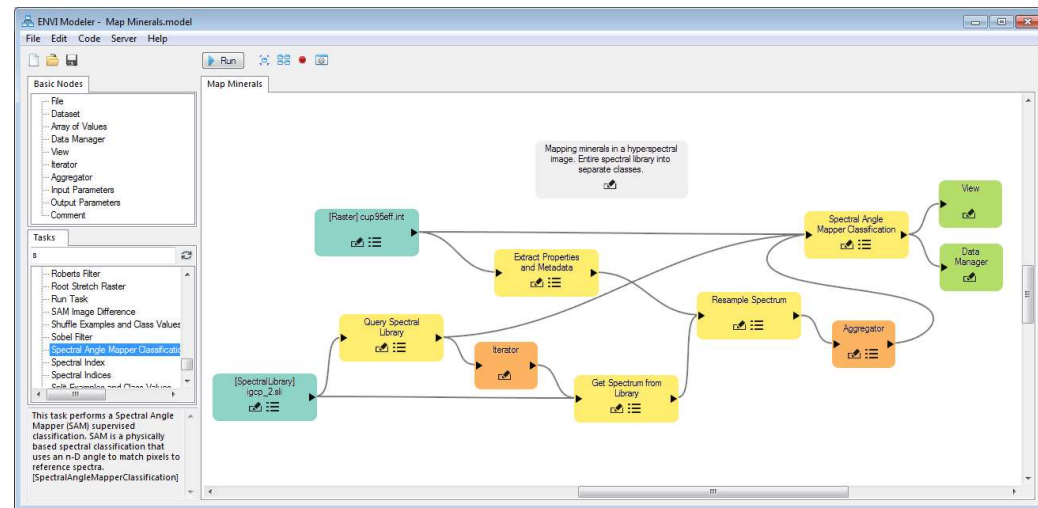
11 – 23 June 2018

Data Japan Hydrographic Association
Image Landsat / Copernicus
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Google Earth

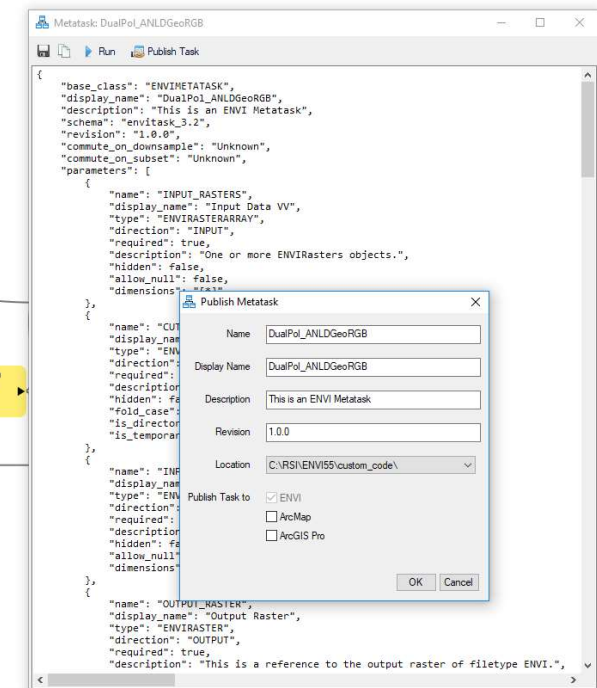
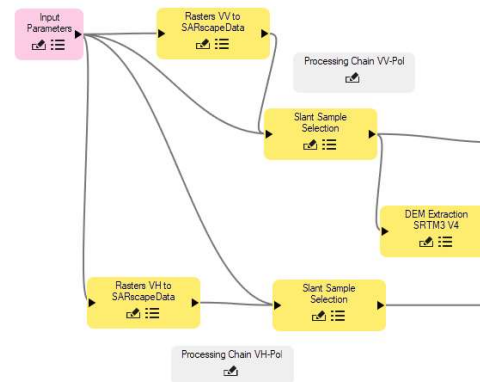
ENVI Modeler

- A visual programming tool to create custom task-based workflows in ENVI
- Combines the power of the ENVI API with a simple and intuitive user interface
 - Build workflows without any knowledge of ENVI programming
- Batch-process data
- Generate IDL and Python programs from models

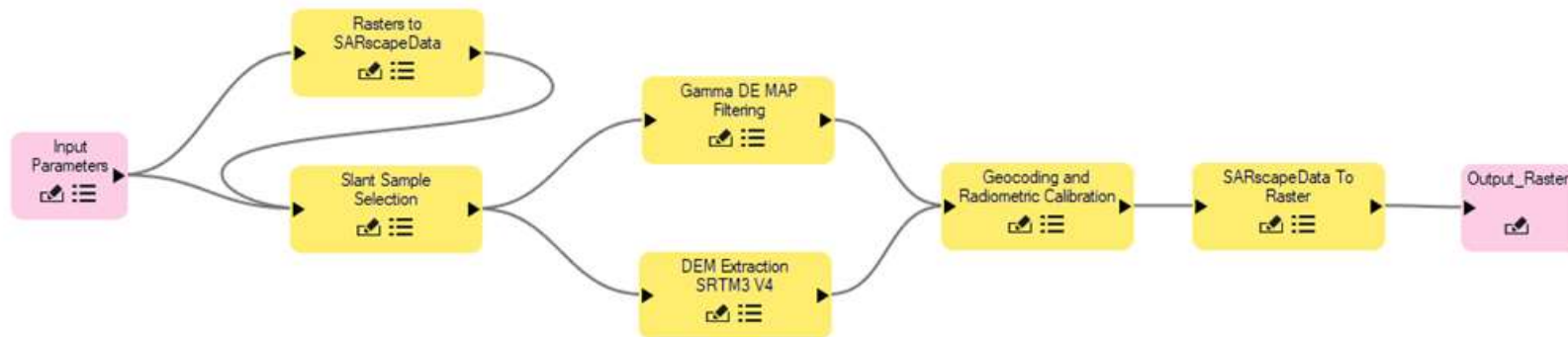


ENVI Modeler

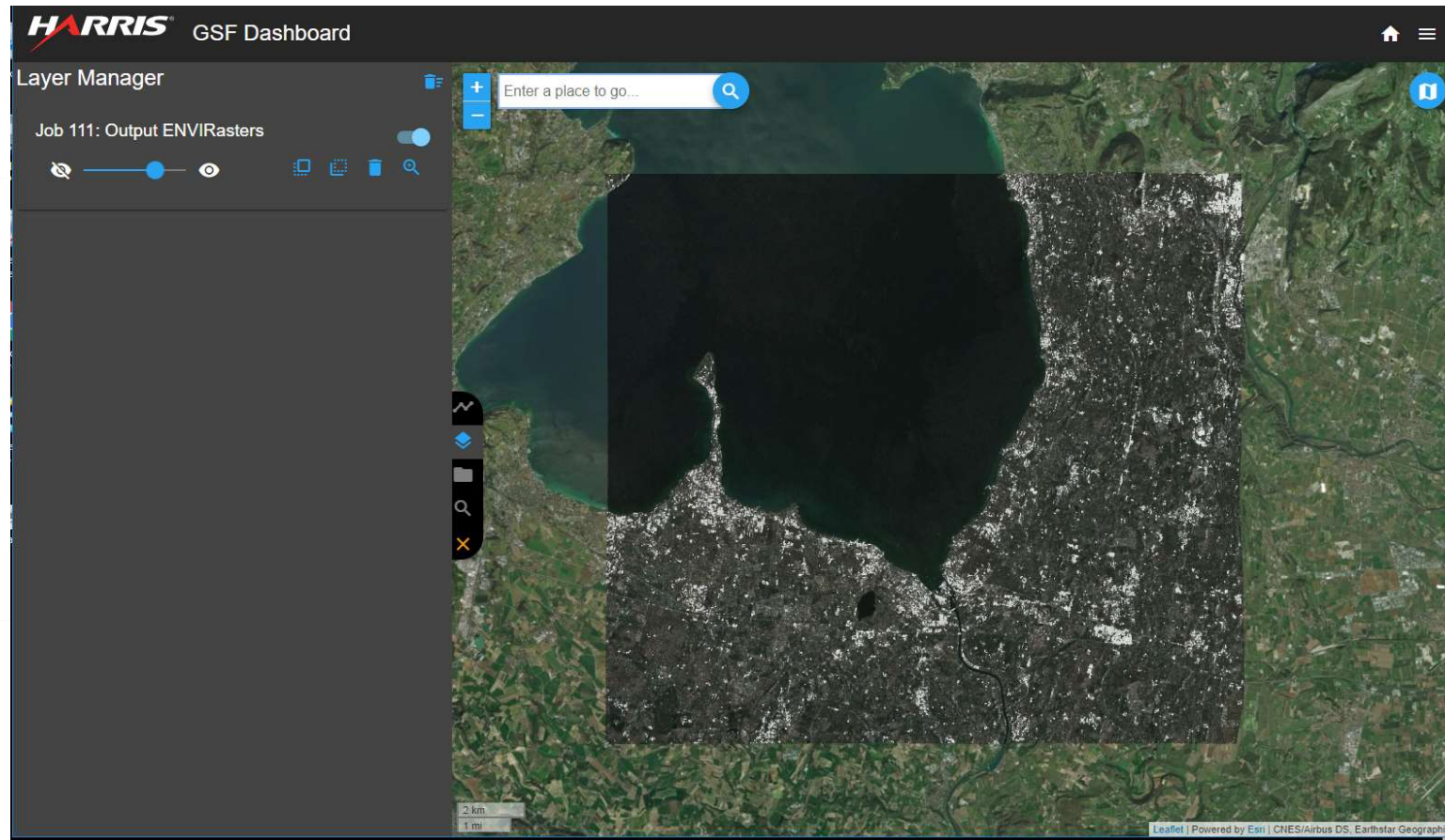
- Workflows are immediately deployed in desktop, enterprise and cloud environment, such as:
- Desktop
- ENVI
- ArcMap
- ArcGIS Pro
- Enterprise
- GSF (Geospatial Services Framework)
- ArcGIS Server
- Cloud
- GSF (Geospatial Services Framework)



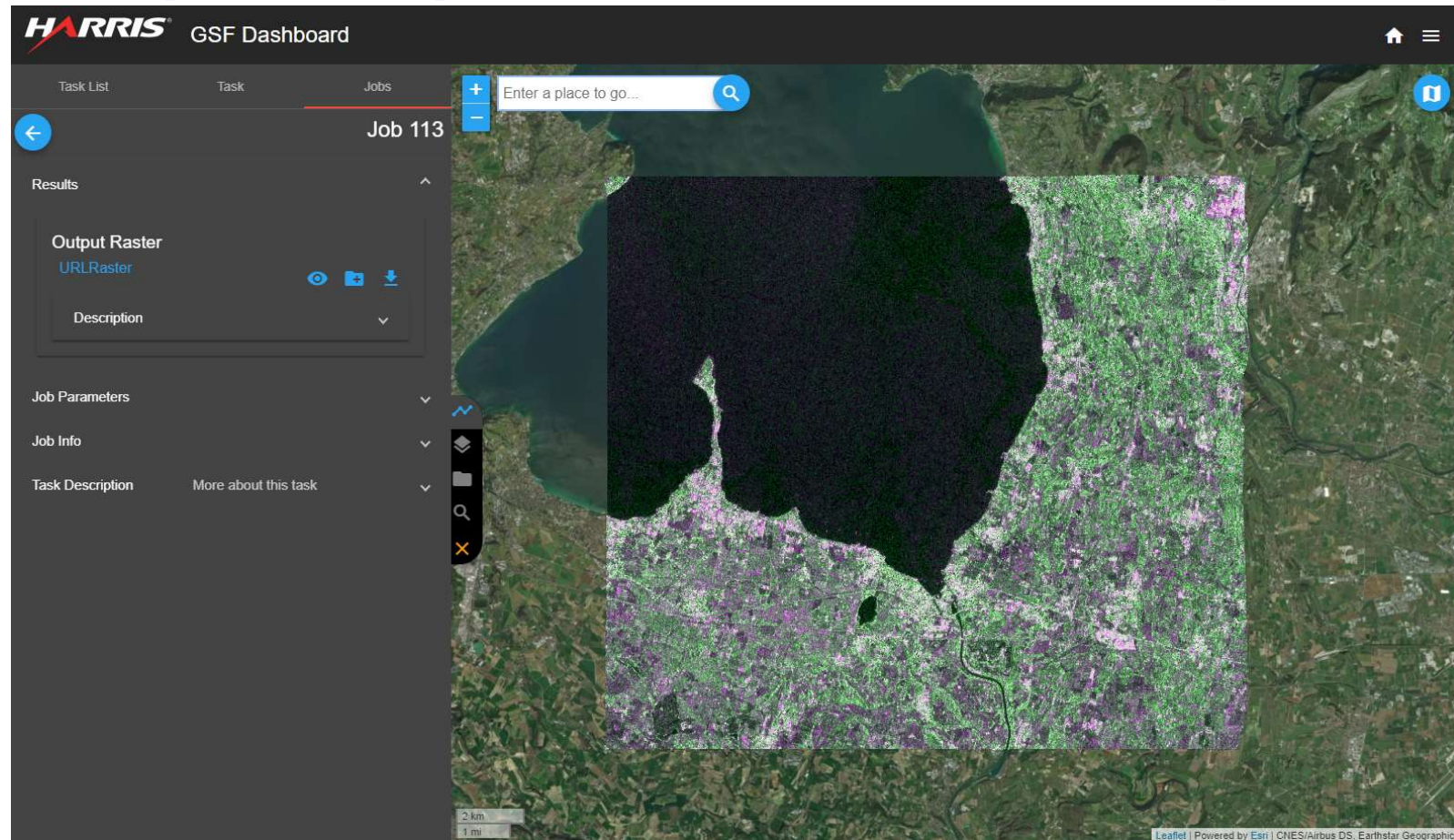
Ano now.... SARscape in ENVI modeler!



Example #1 – (S1 Filtering and Geocoding)

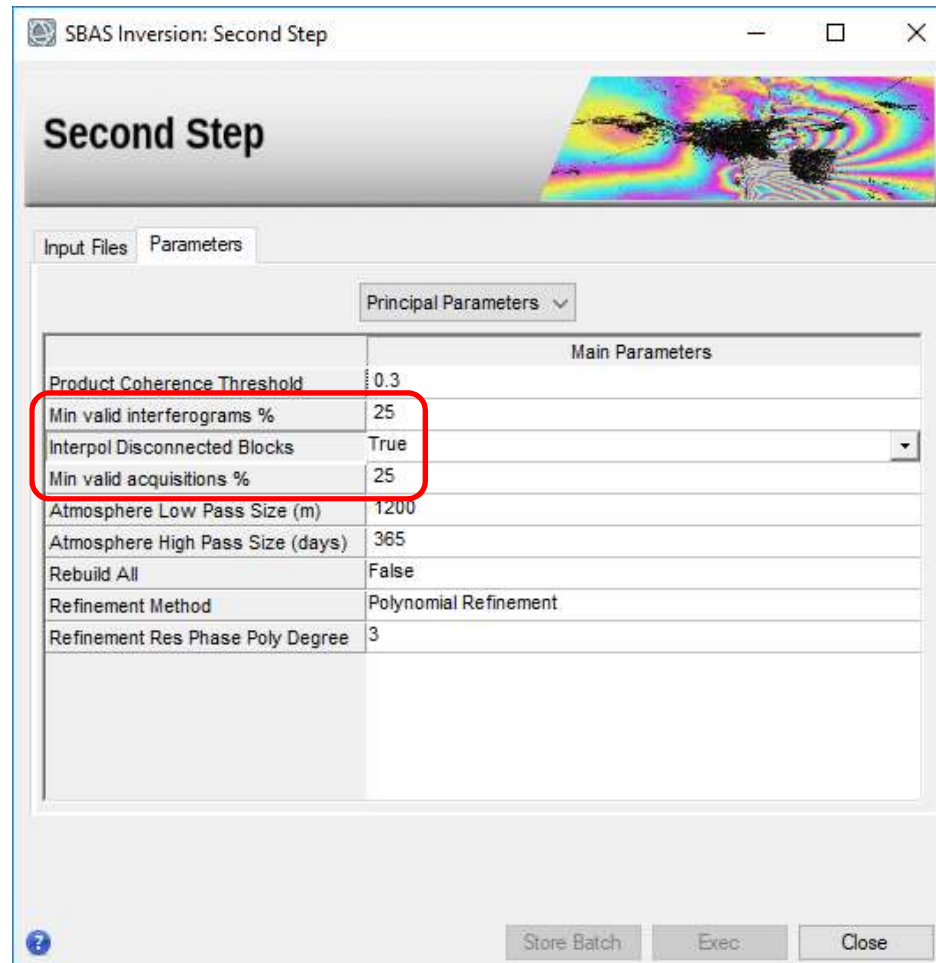


Example #2 – (S1 Dual-Polarization to RGB)



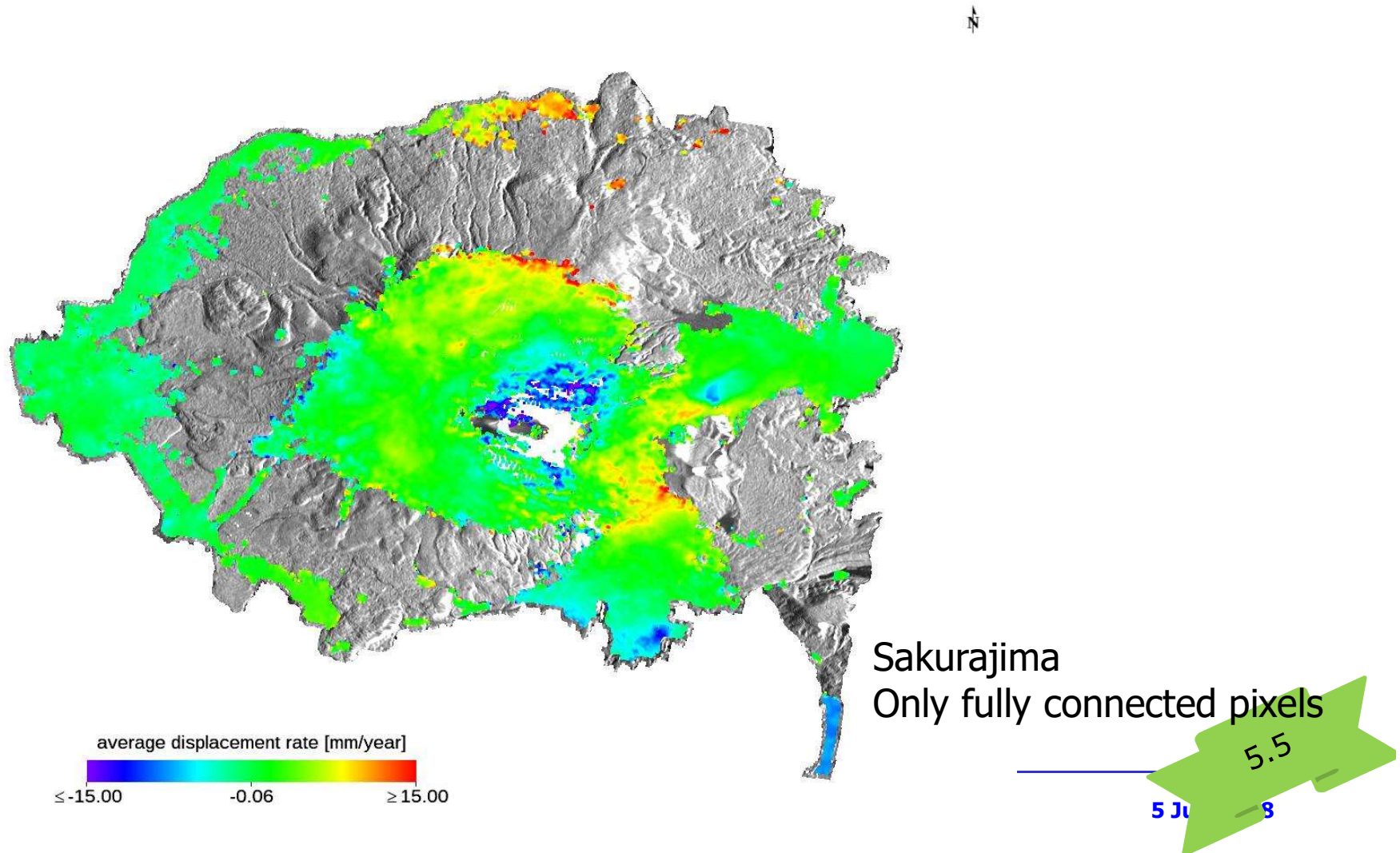
Discontinuous SBAS

Full control

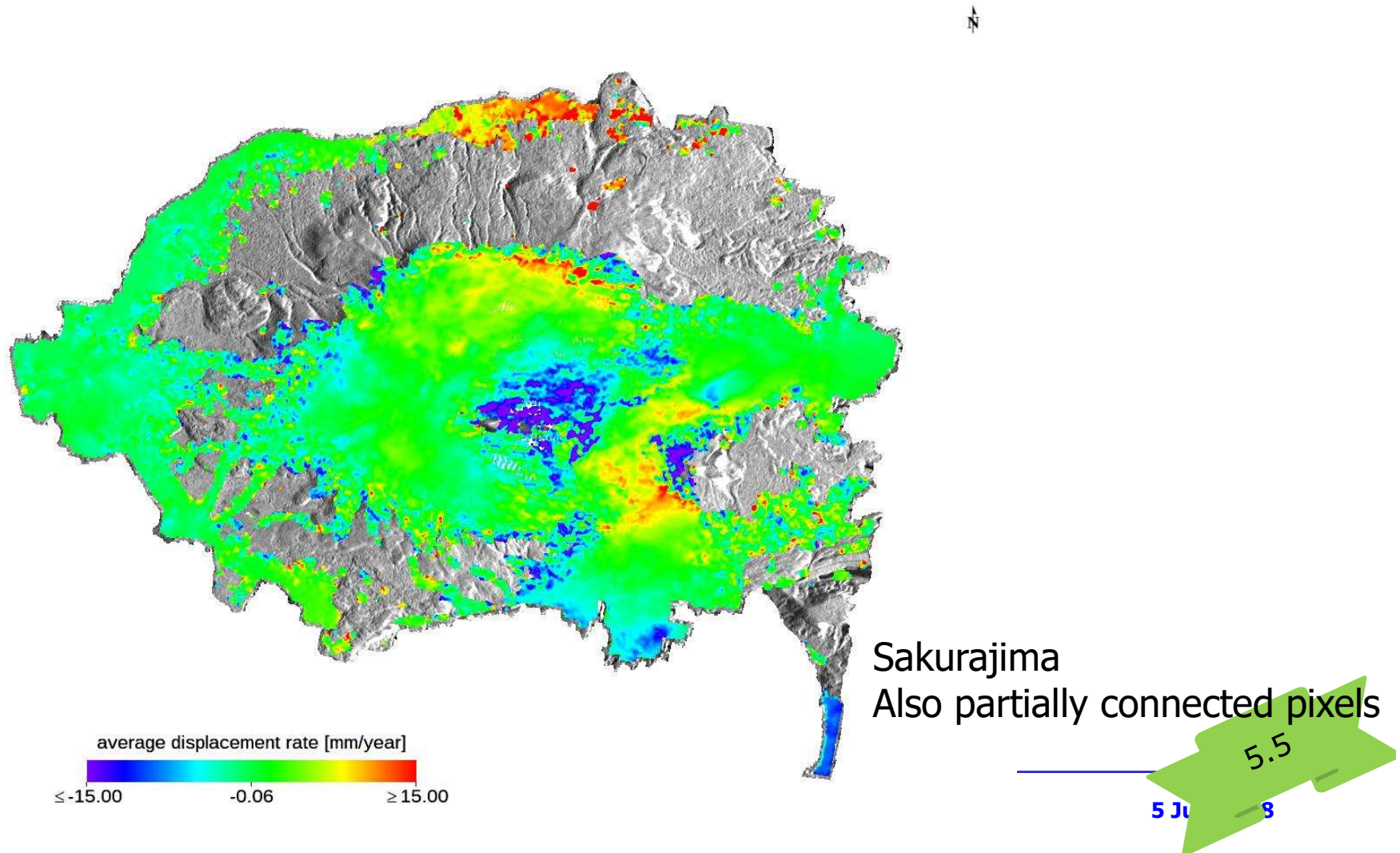


Principal Parameters	
Main Parameters	
Product Coherence Threshold	0.3
Min valid interferograms %	25
Interpol Disconnected Blocks	True
Min valid acquisitions %	25
Atmosphere Low Pass Size (m)	1200
Atmosphere High Pass Size (days)	365
Rebuild All	False
Refinement Method	Polynomial Refinement
Refinement Res Phase Poly Degree	3

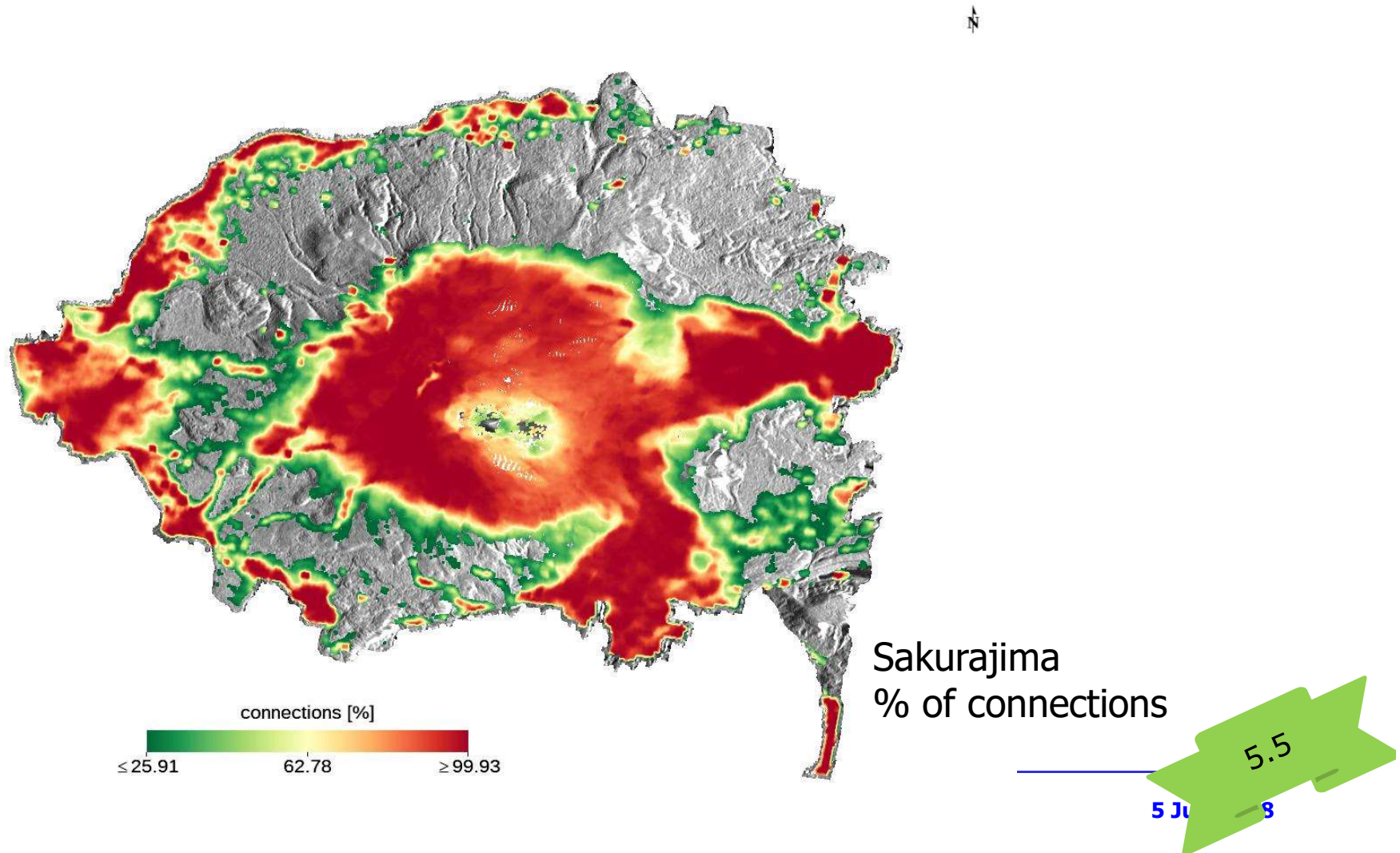
Discontinuous SBAS



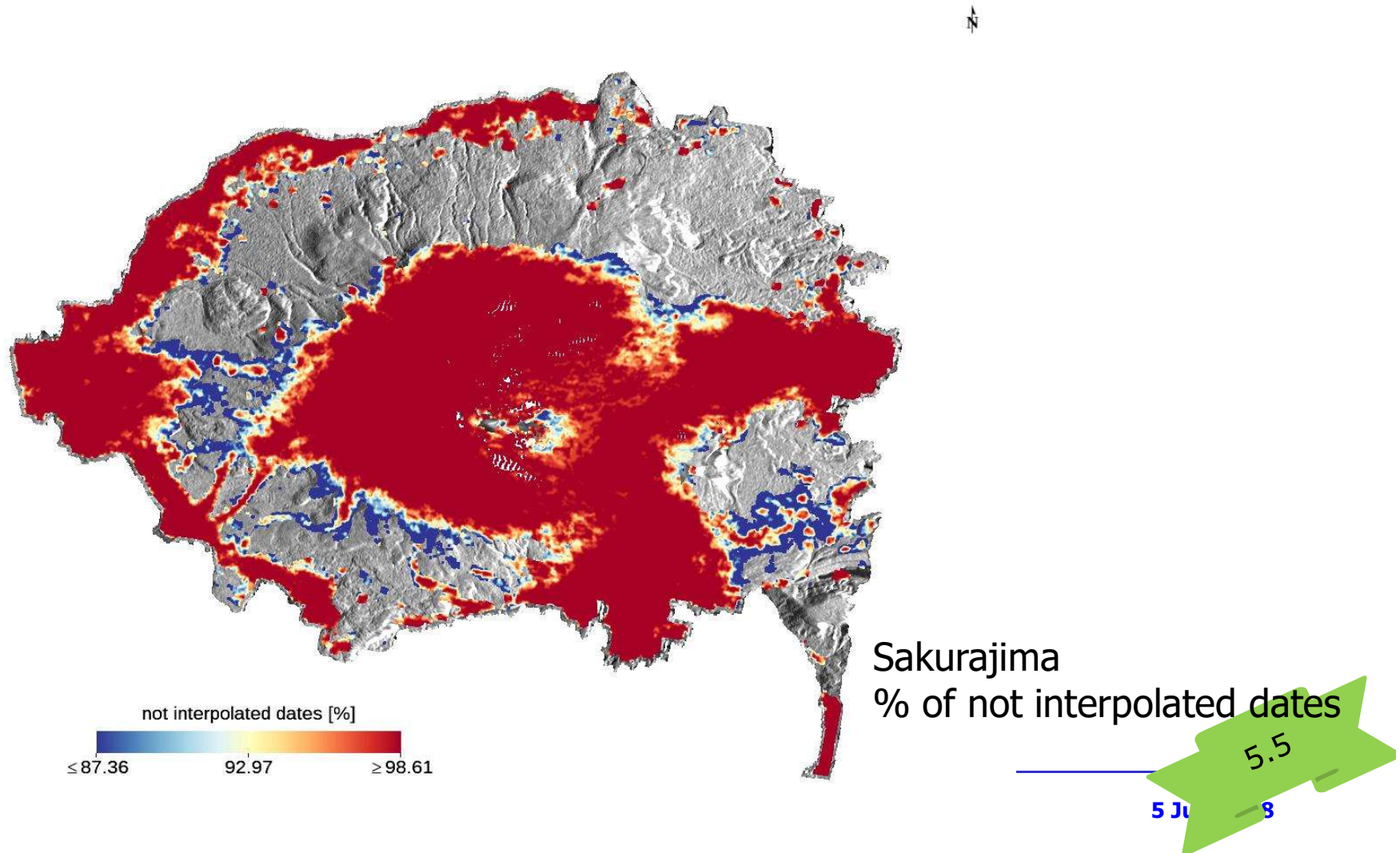
Discontinuous SBAS



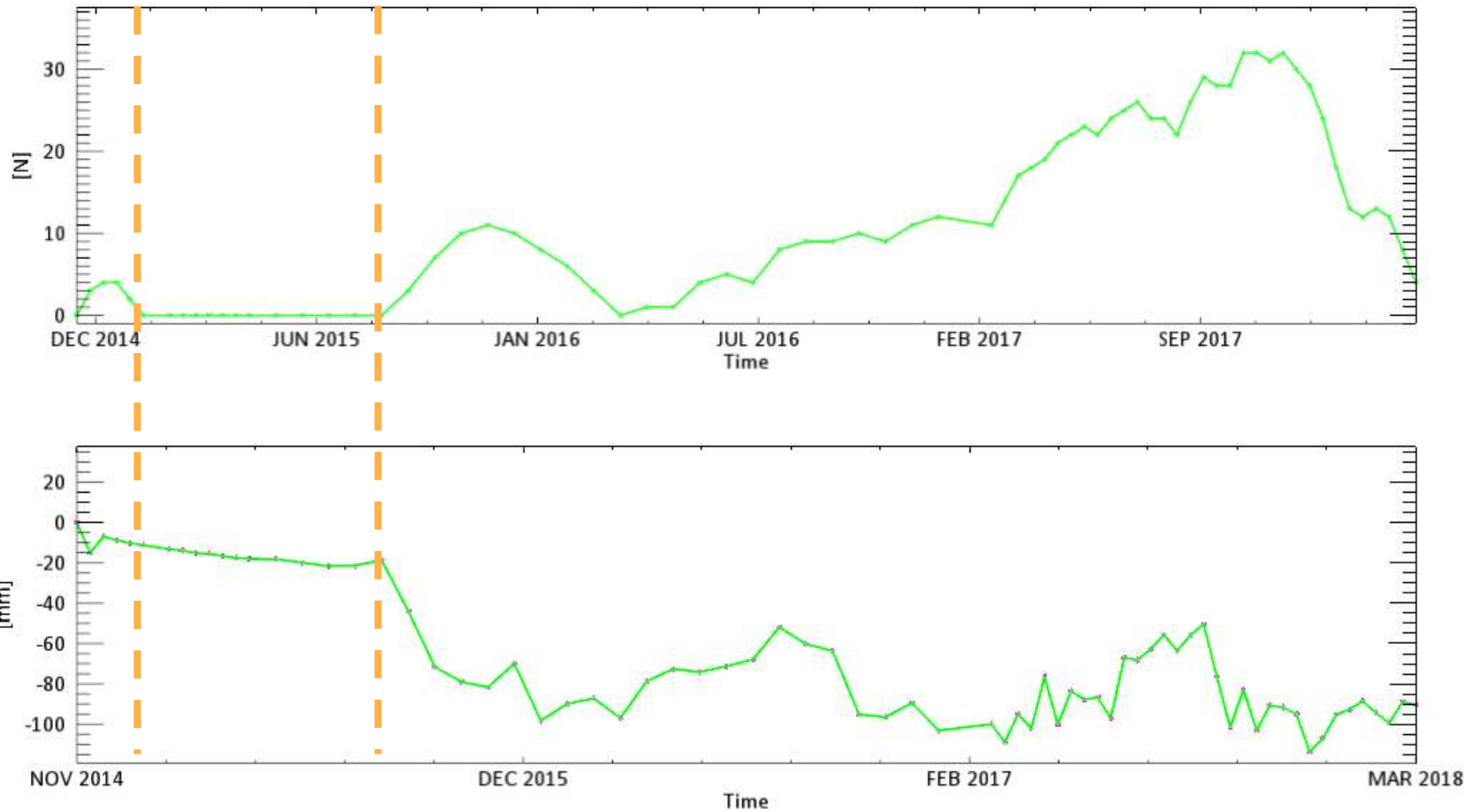
Discontinuous SBAS



Discontinuous SBAS



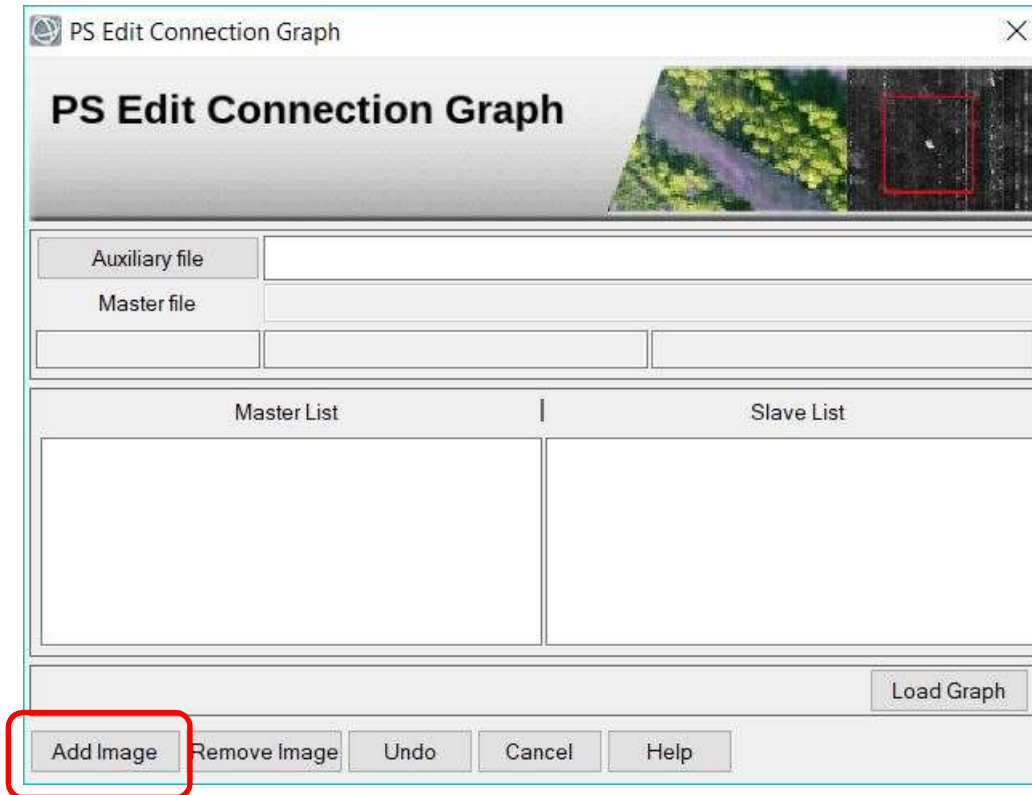
Discontinuous SBAS



SBAS speed-up

First inversion	1.5 – 2 times
Second inversion	3 – 5 times
Geocoding	4 - 10 times

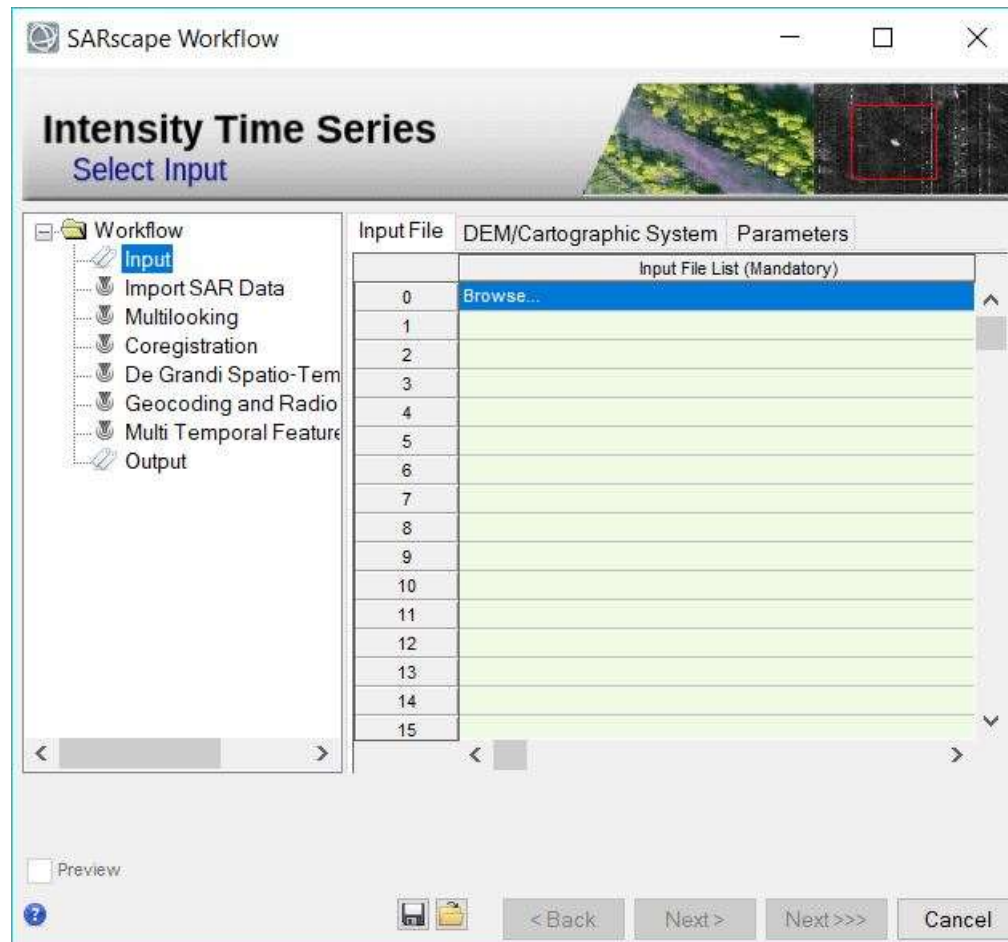
Incremental PS



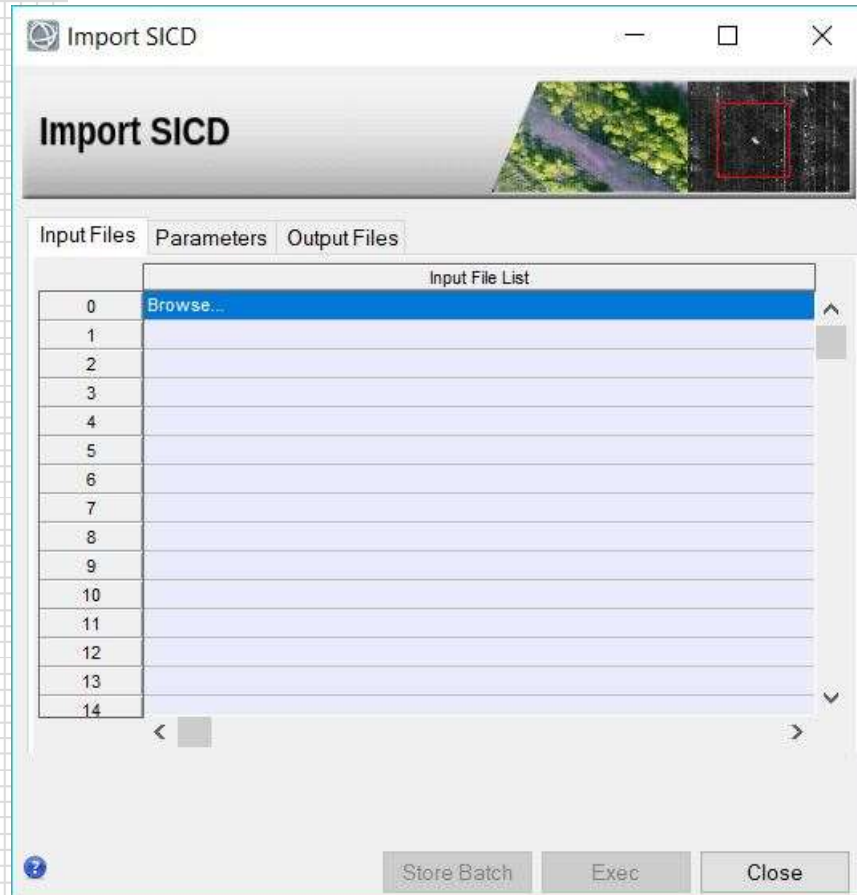
General spaceborne SAR import



Workflows start with spaceborne SAR import (if necessary)



NGA data formats support



Sensor Independent Complex Data



Sensor Independent Derived Data

PAZ data preliminary support

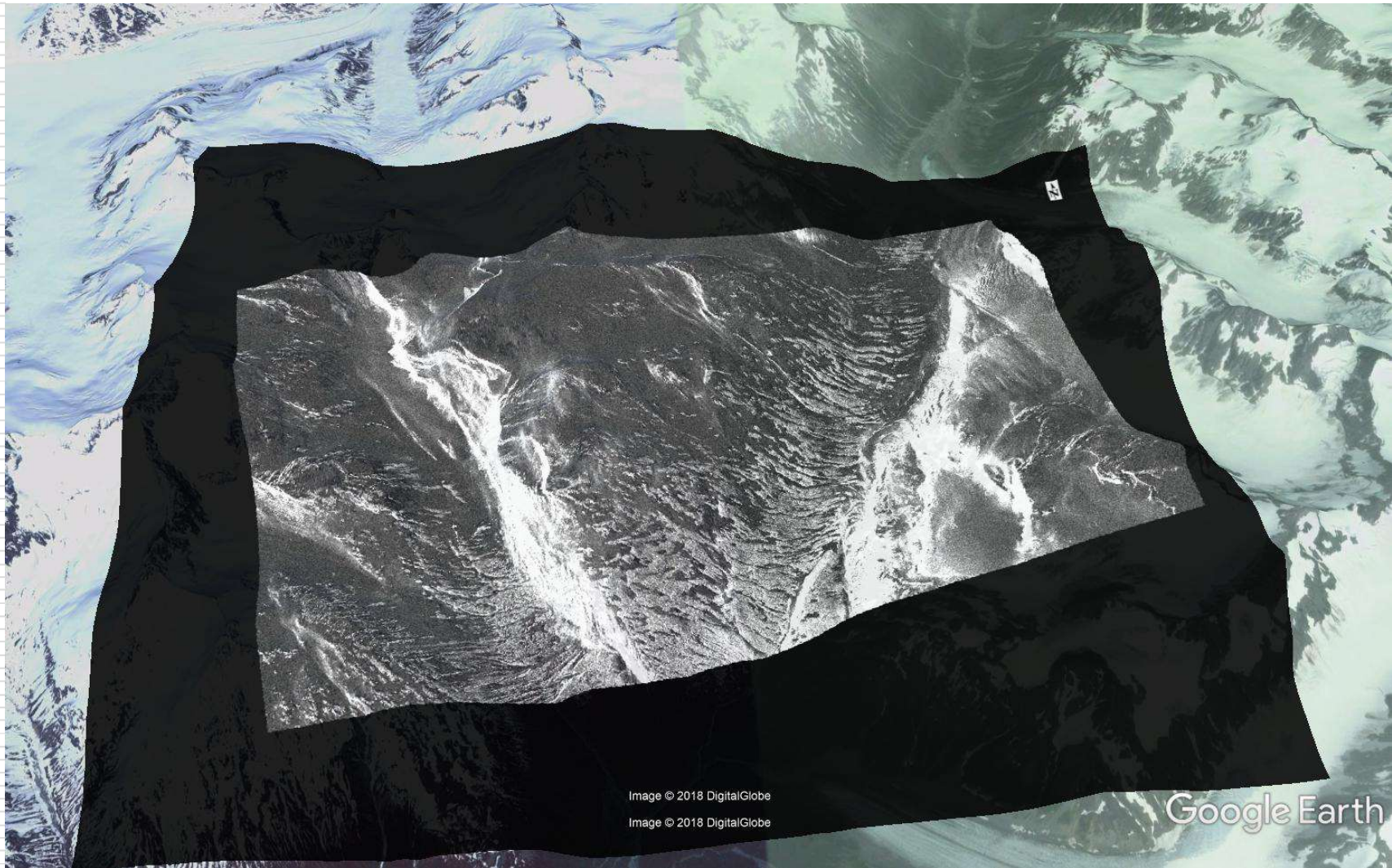
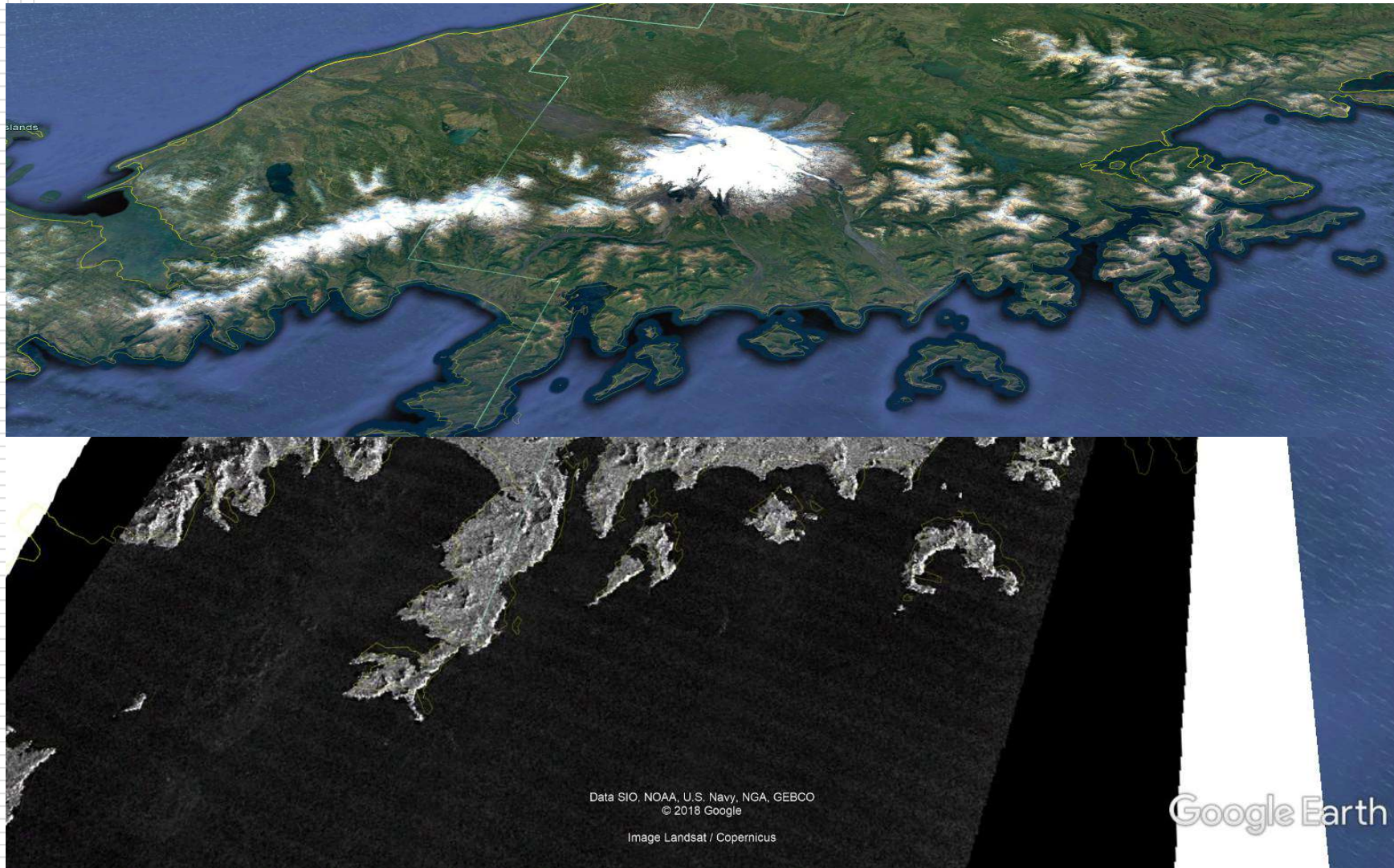


Image © 2018 DigitalGlobe

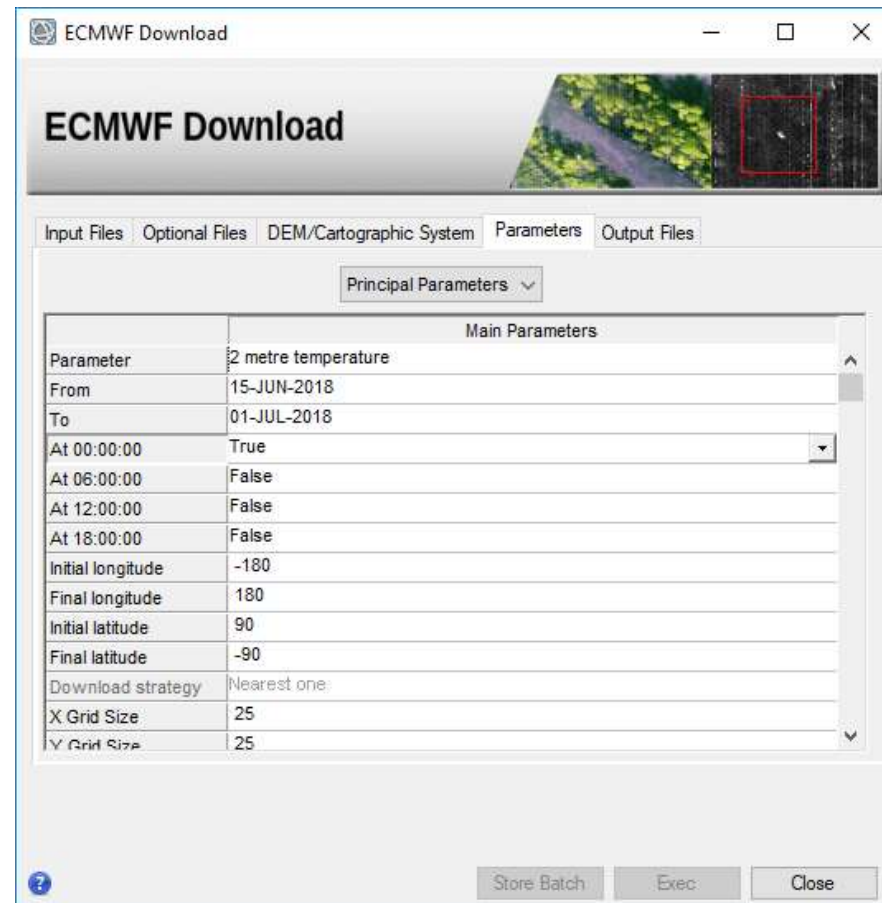
Image © 2018 DigitalGlobe

Google Earth

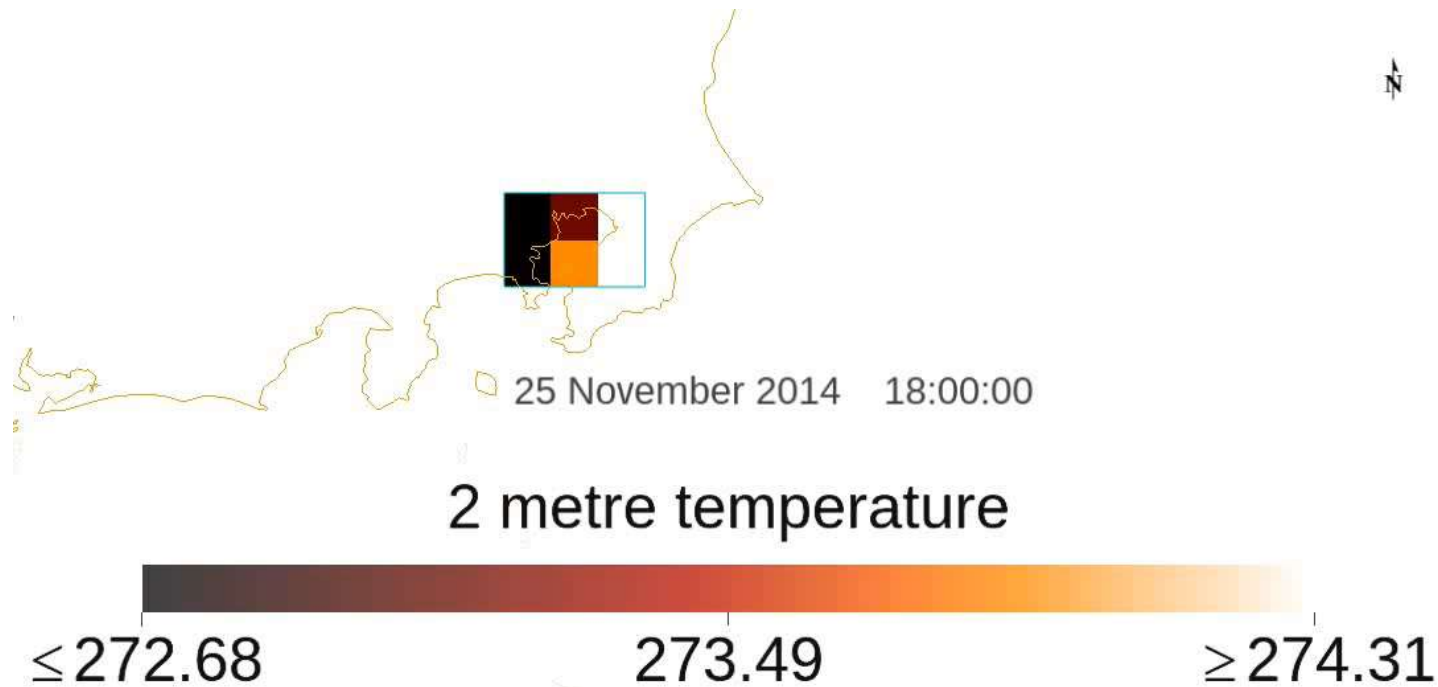
PAZ data preliminary support



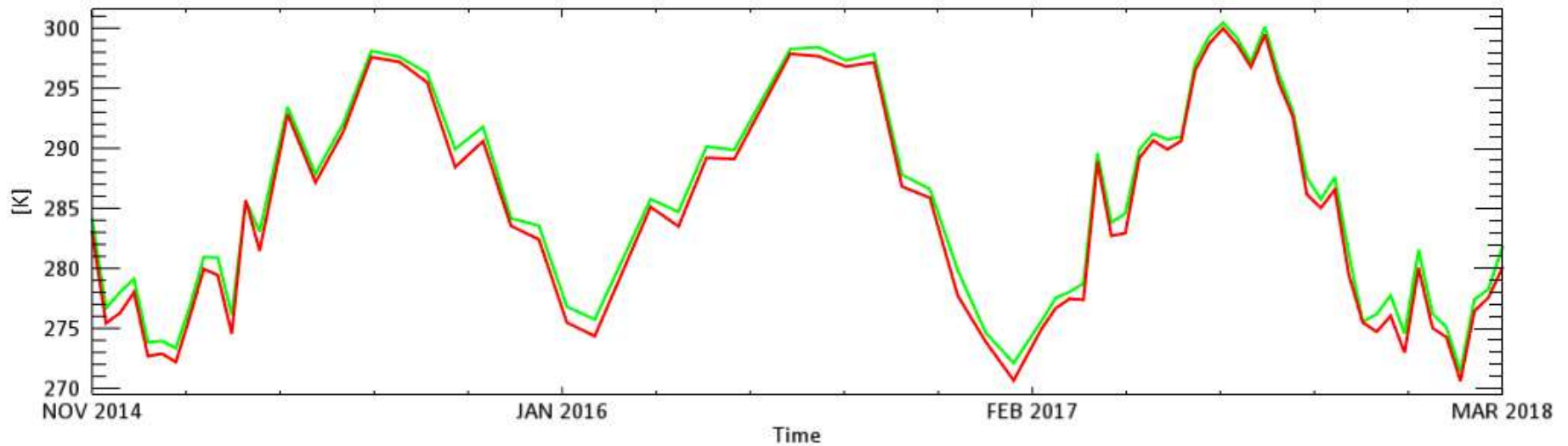
European Center Medium Weather Forecast data support



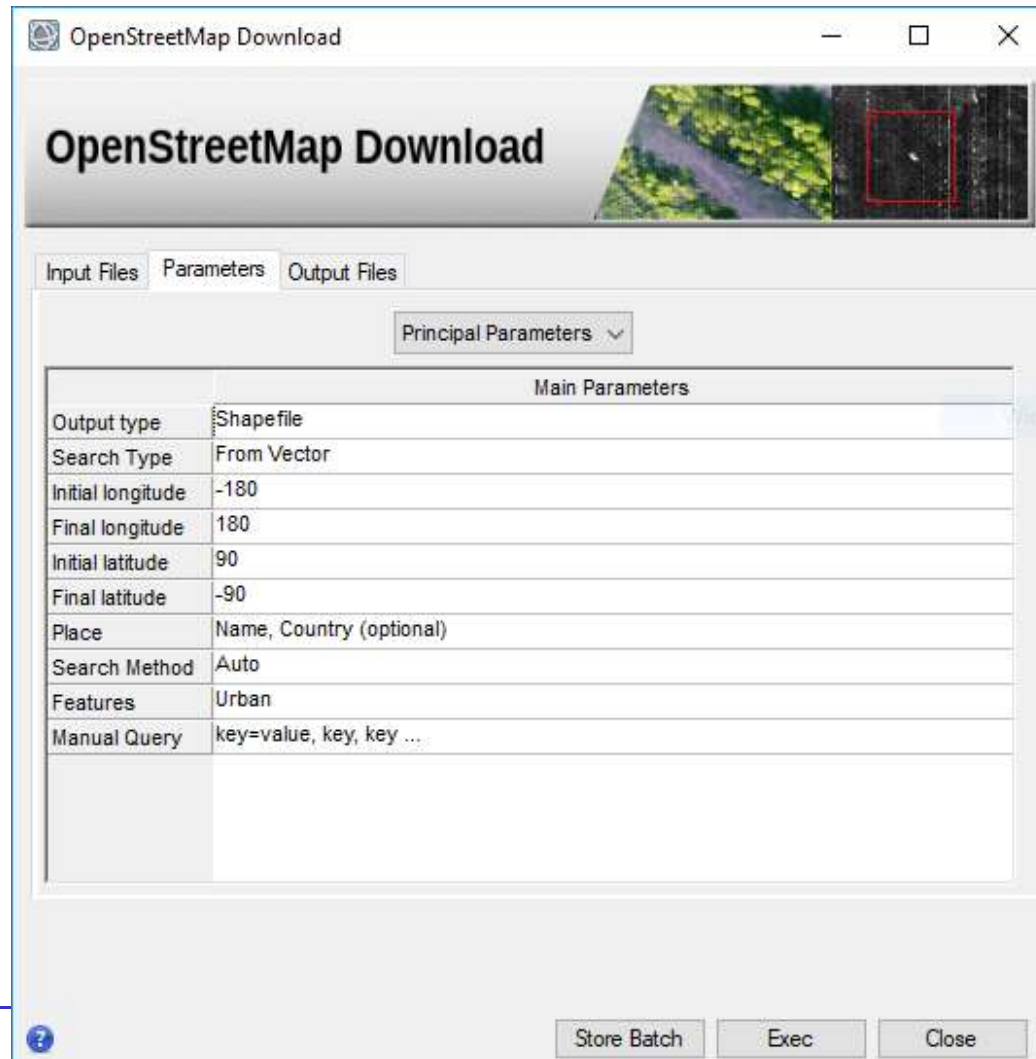
European Center Medium Weather Forecast data support



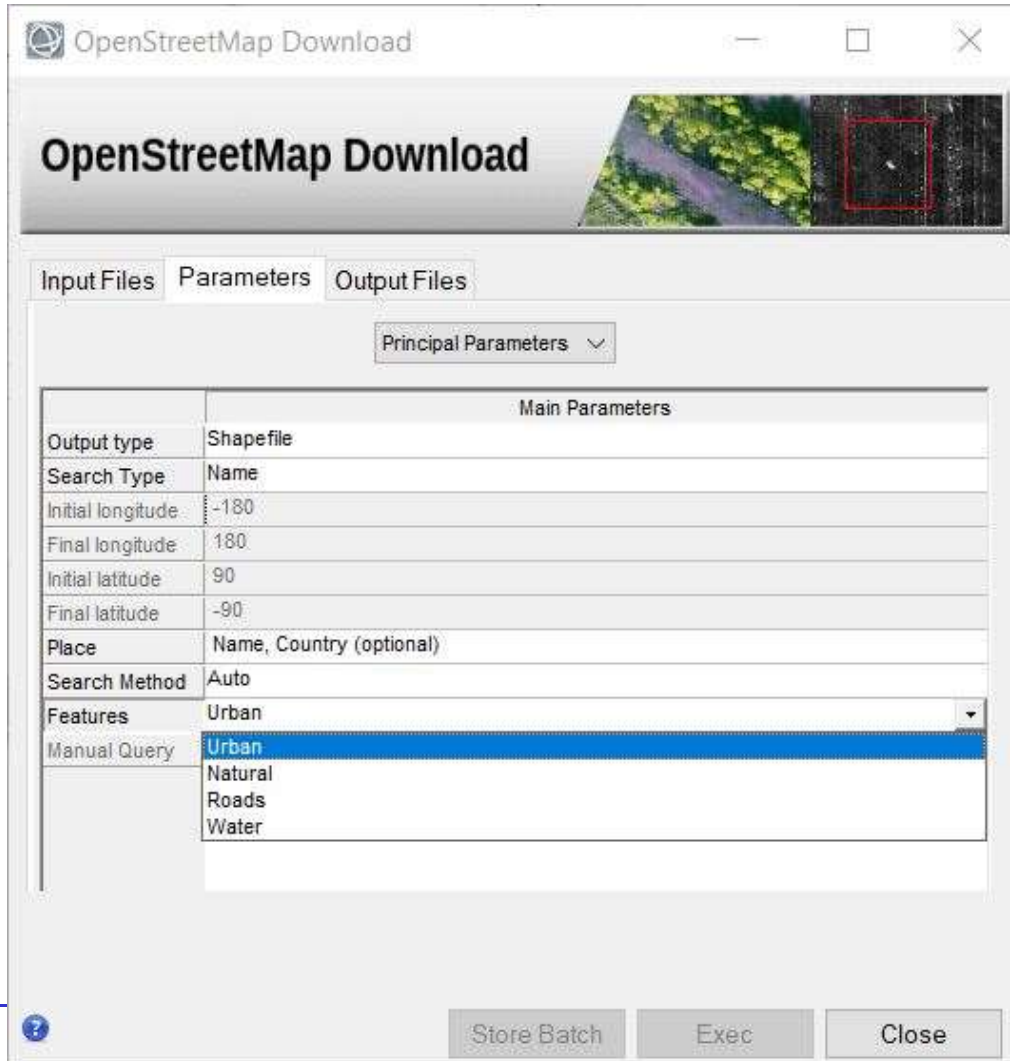
European Center Medium Weather Forecast data support



Open Street Map data support

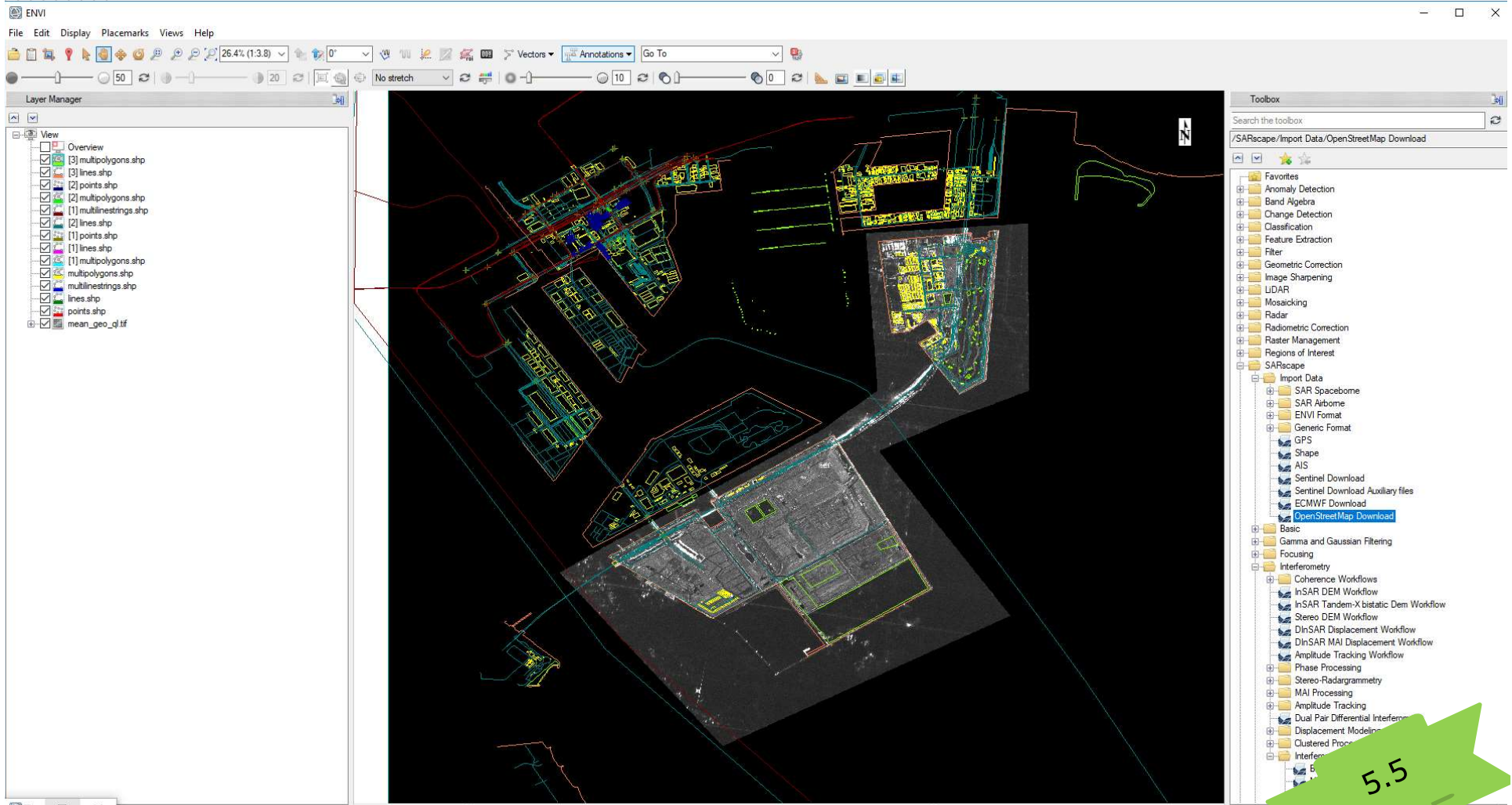


Open Street Map data support

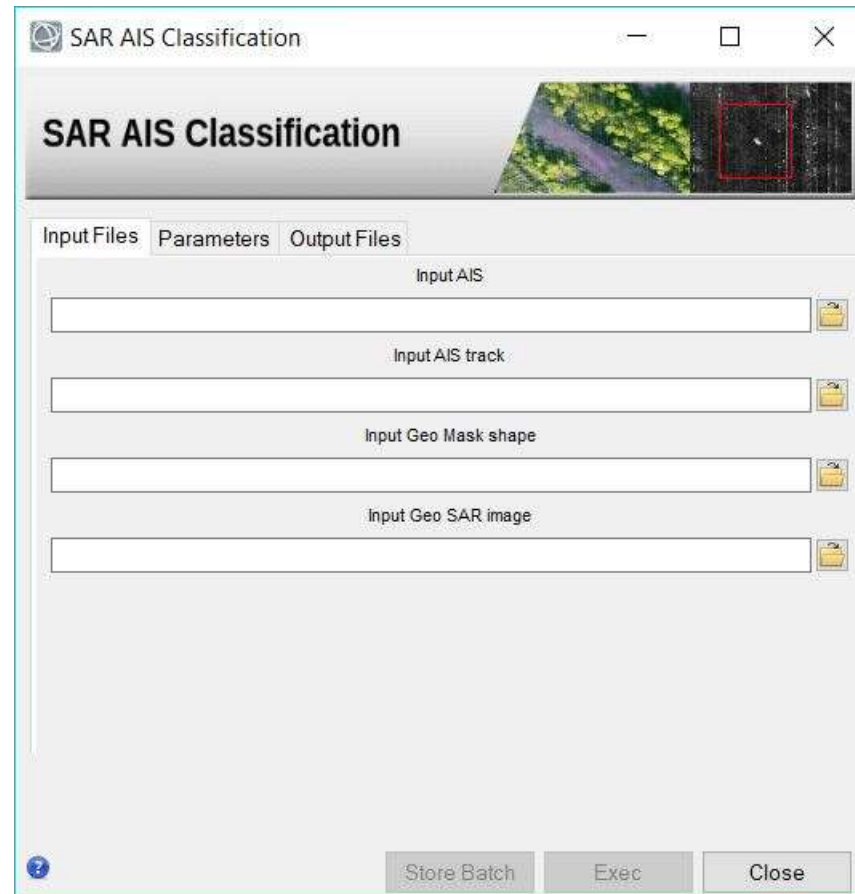


Main Parameters	
Output type	Shapefile
Search Type	Name
Initial longitude	-180
Final longitude	180
Initial latitude	90
Final latitude	-90
Place	Name, Country (optional)
Search Method	Auto
Features	Urban
Manual Query	Urban

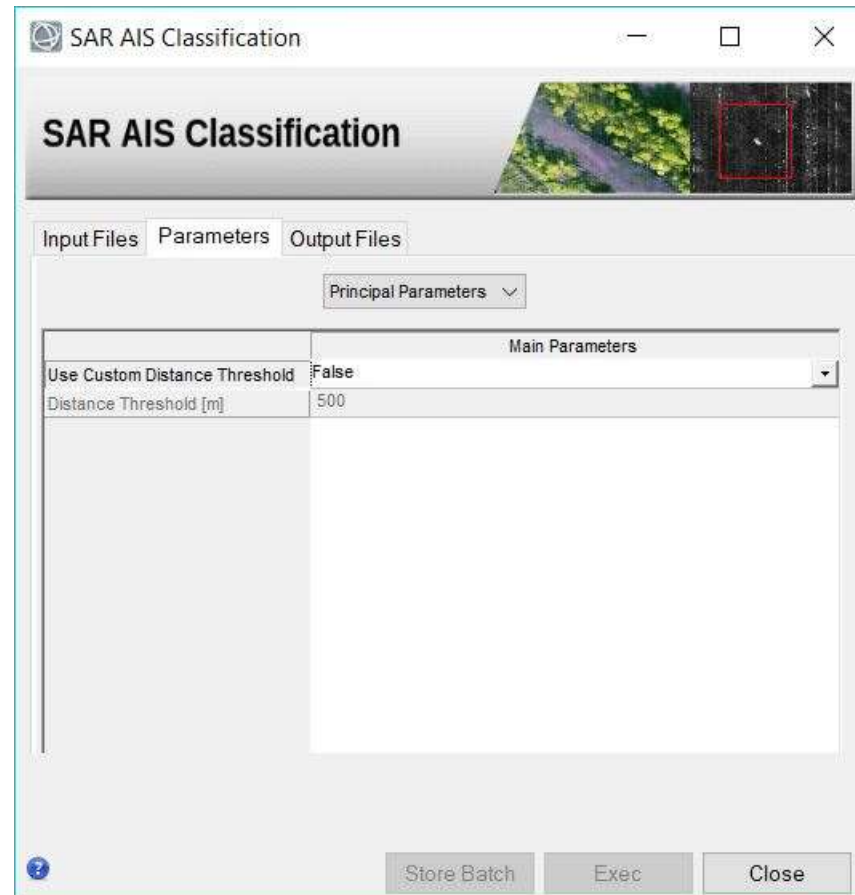
Open Street Map data support



SAR & AIS match



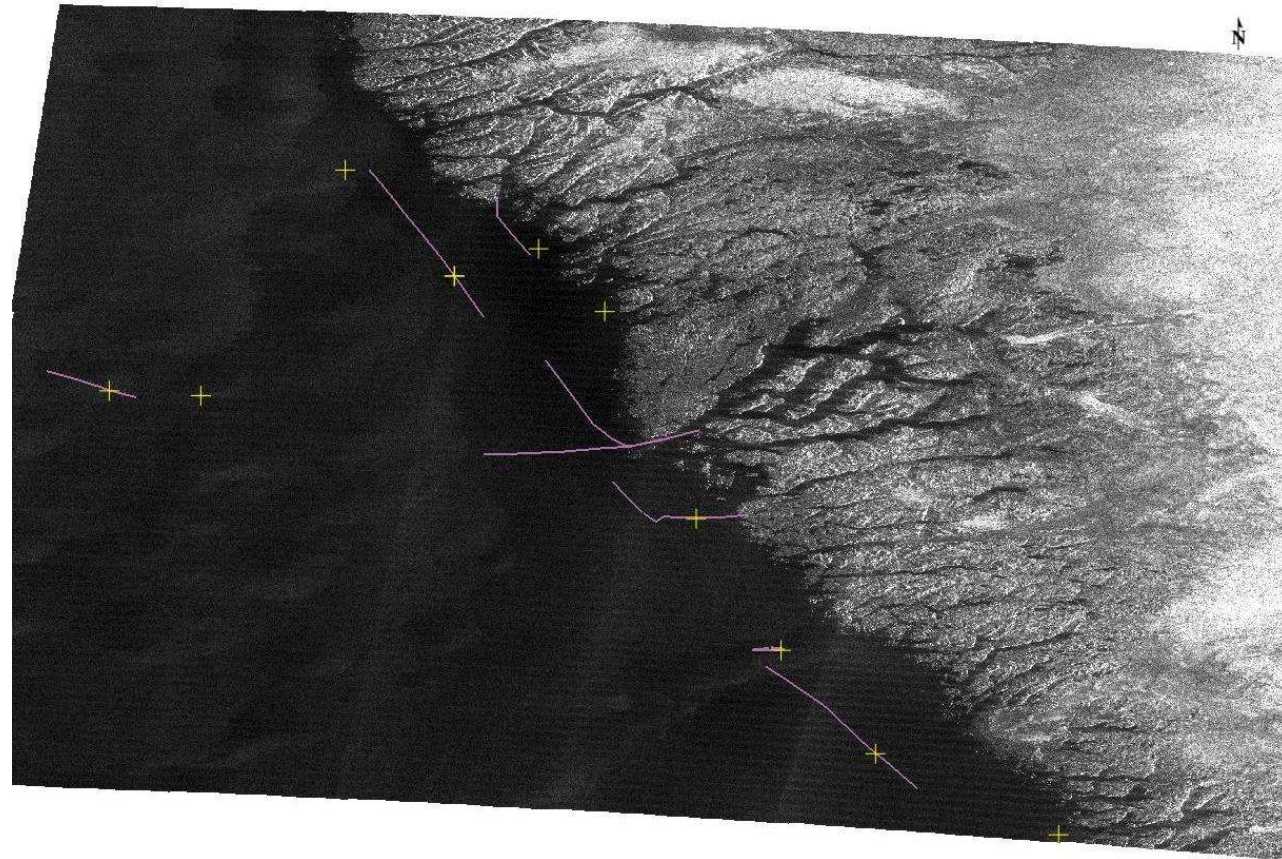
SAR & AIS match



SAR & AIS match

+ SAR

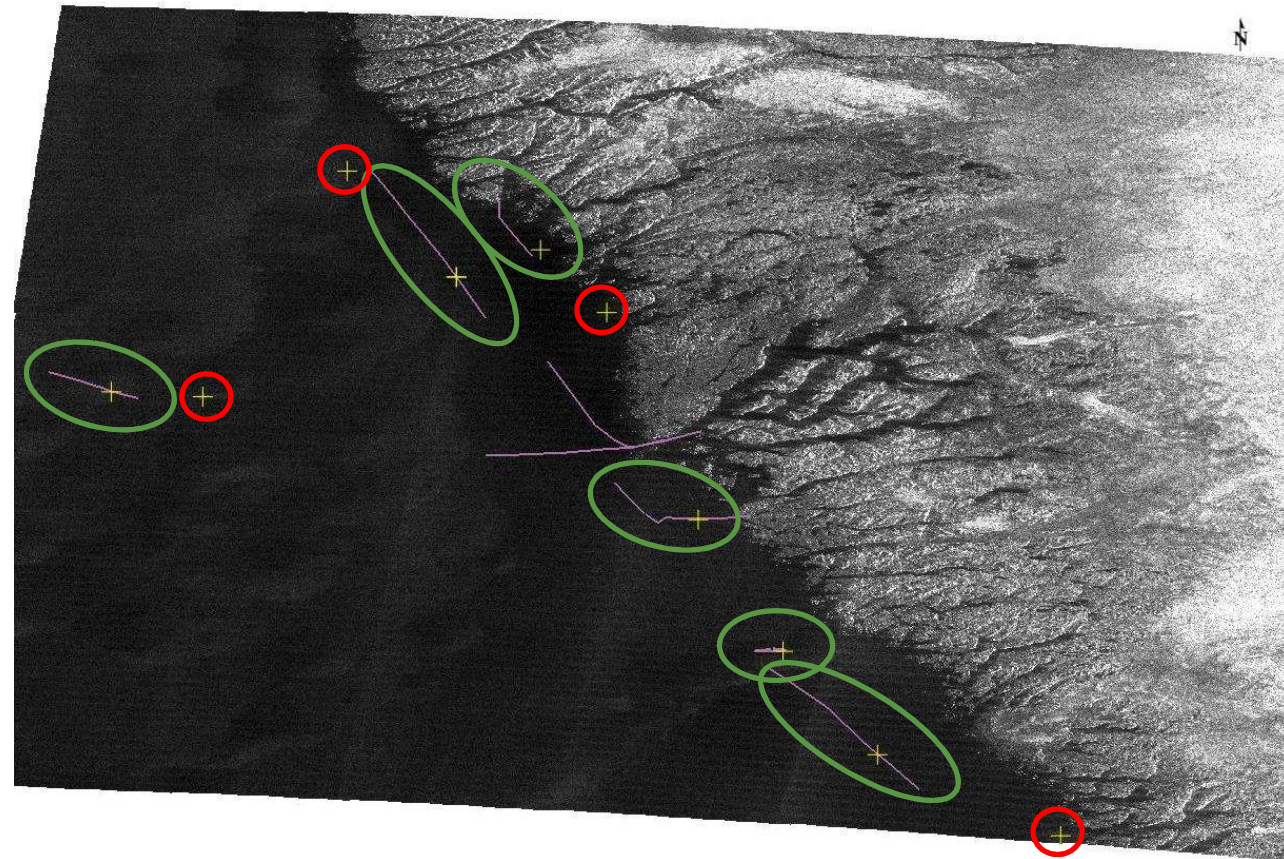
- AIS



SAR, detected ships and AIS data

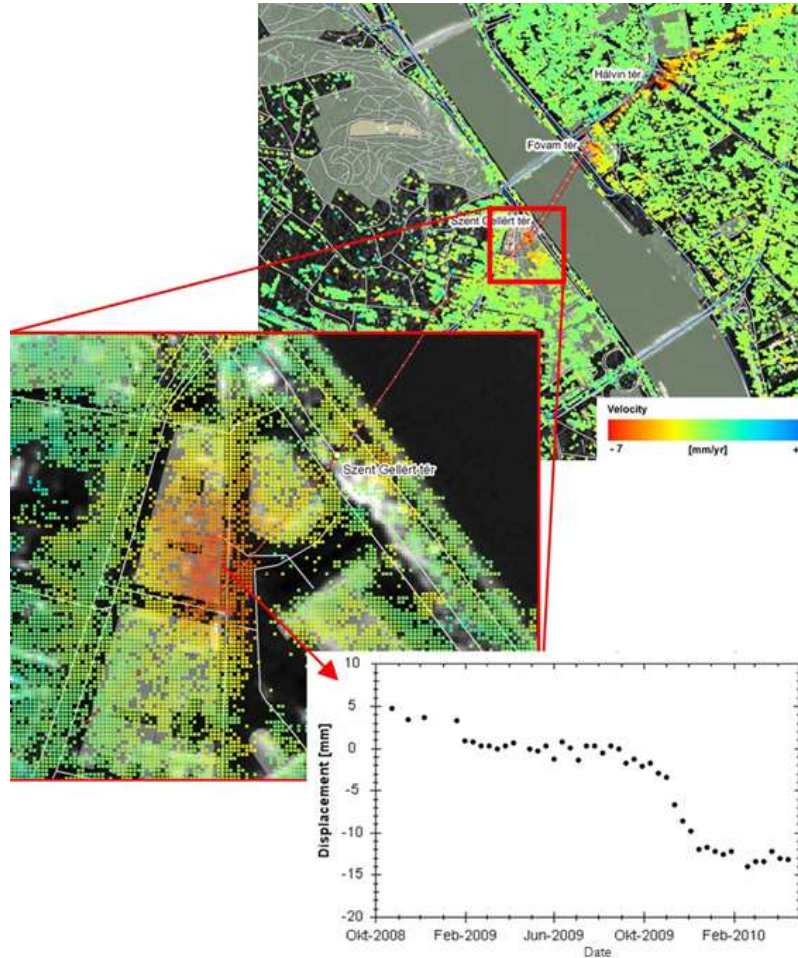
SAR & AIS match

- + SAR
- AIS
- Match
- ???????



SAR, detected ships and AIS data

PS and non-linear time series



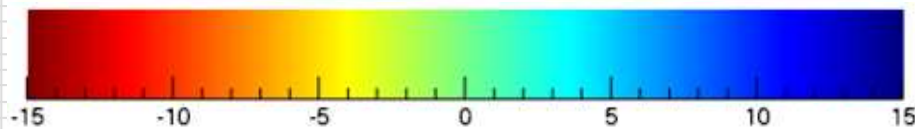
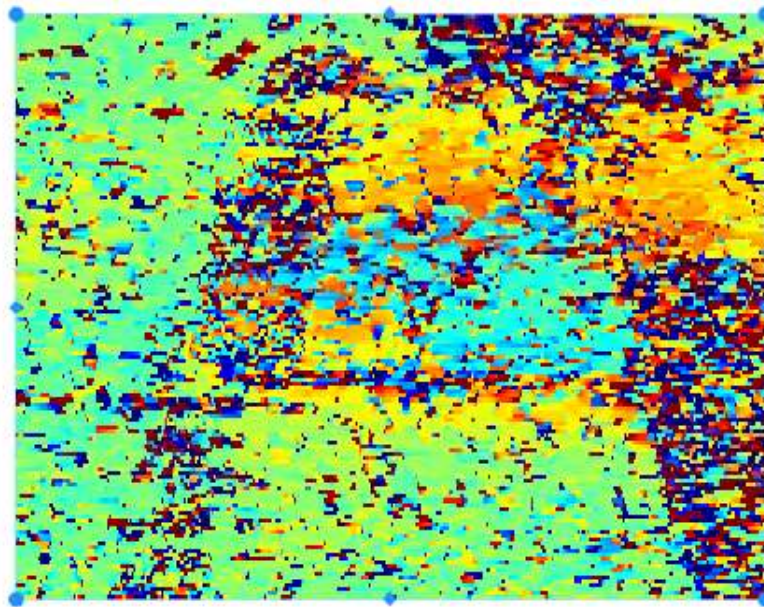
[top] PSI Analysis in the wider area of Station Szent Gellért tér based on 43 TerraSAR-X satellite data sets;

[middle] Focused SBAS Analysis in the area of Station Szent Gellért tér based on 8 TerraSAR-X satellite data sets;

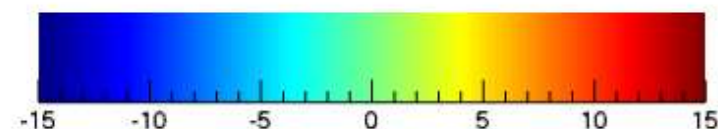
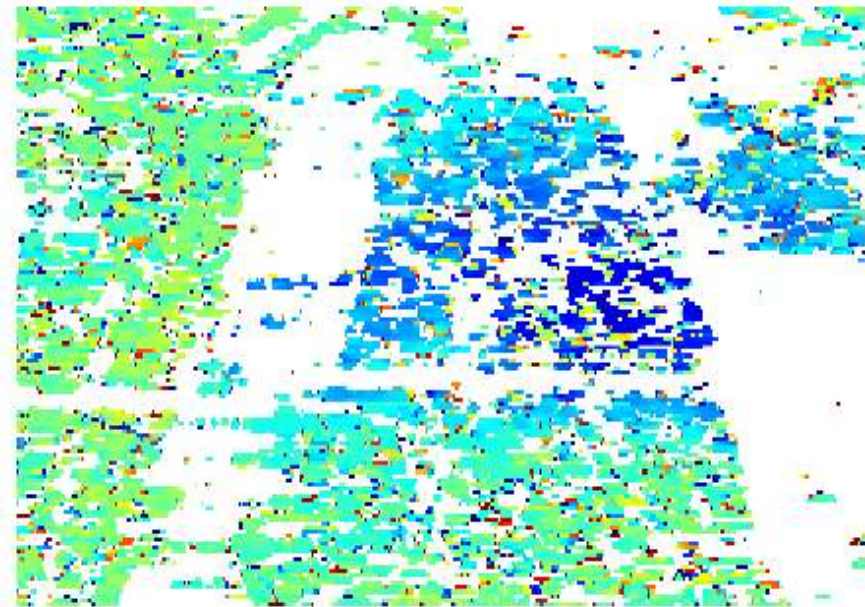
[bottom] Sample time series of surface displacements showing the highly non-linear displacements induced by temporarily restricted time of construction

© Infoterra GmbH

PS and non-linear time series

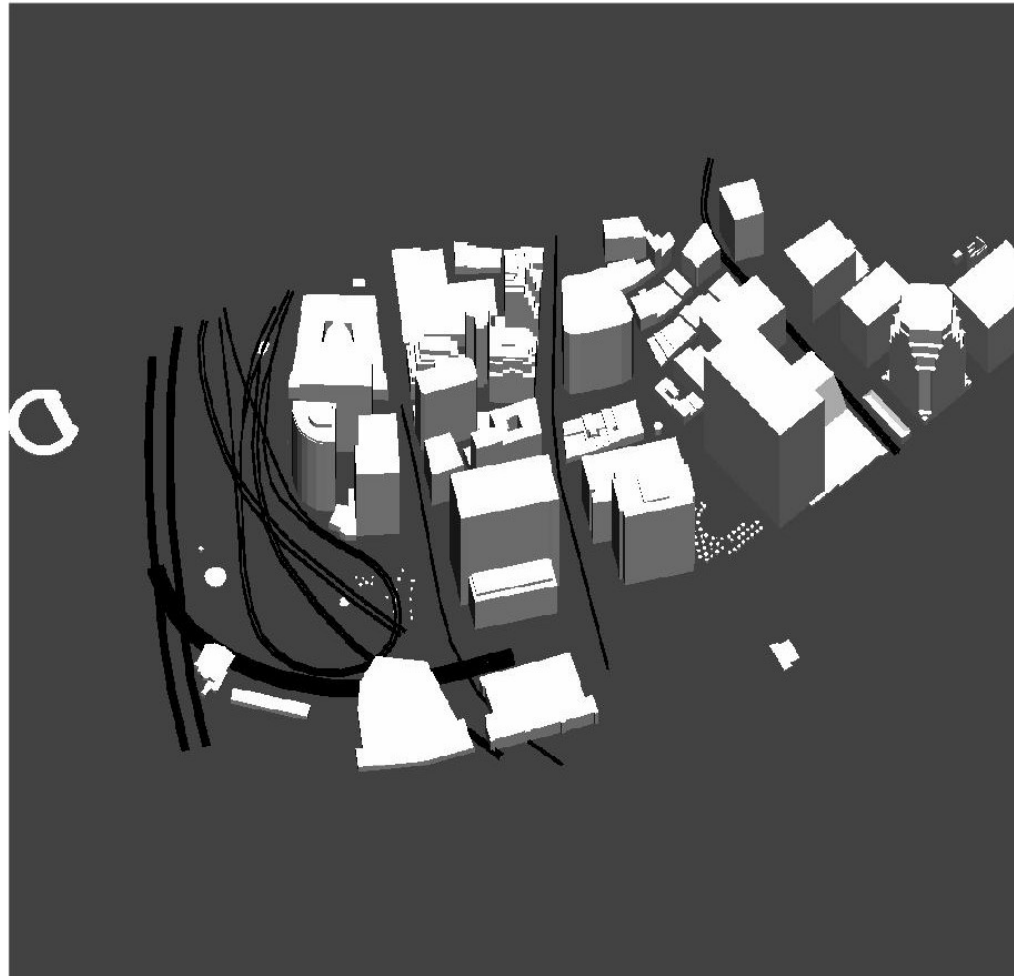


Conventional PS

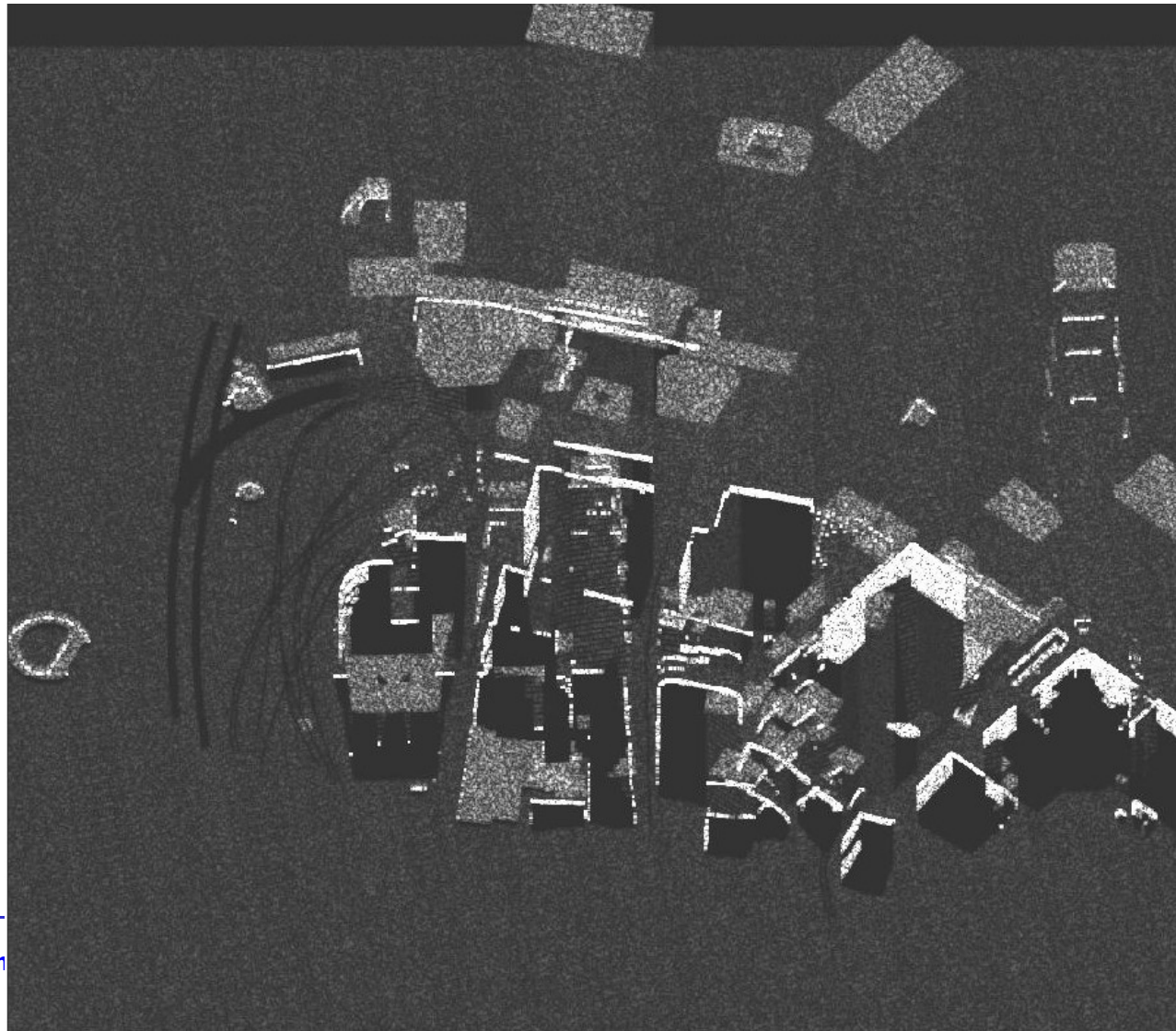


New PS inversion method

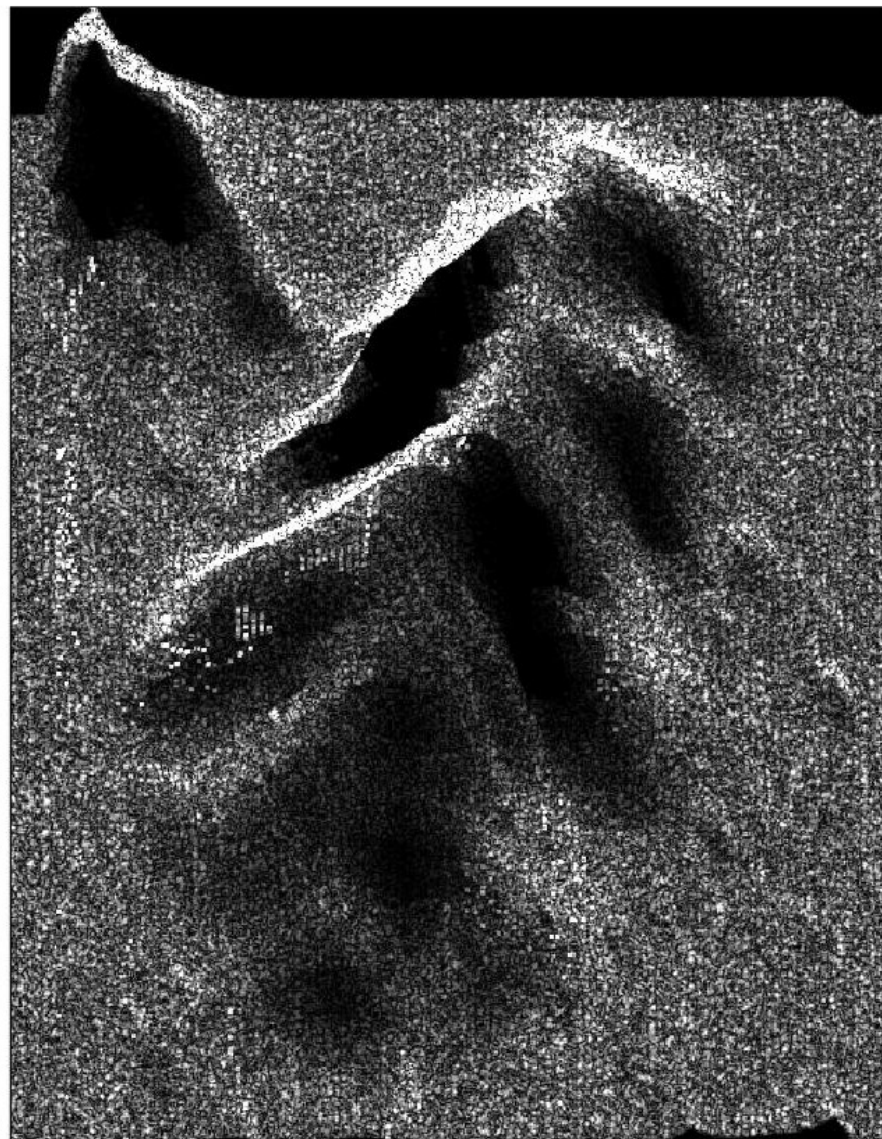
A virtual look into the future...



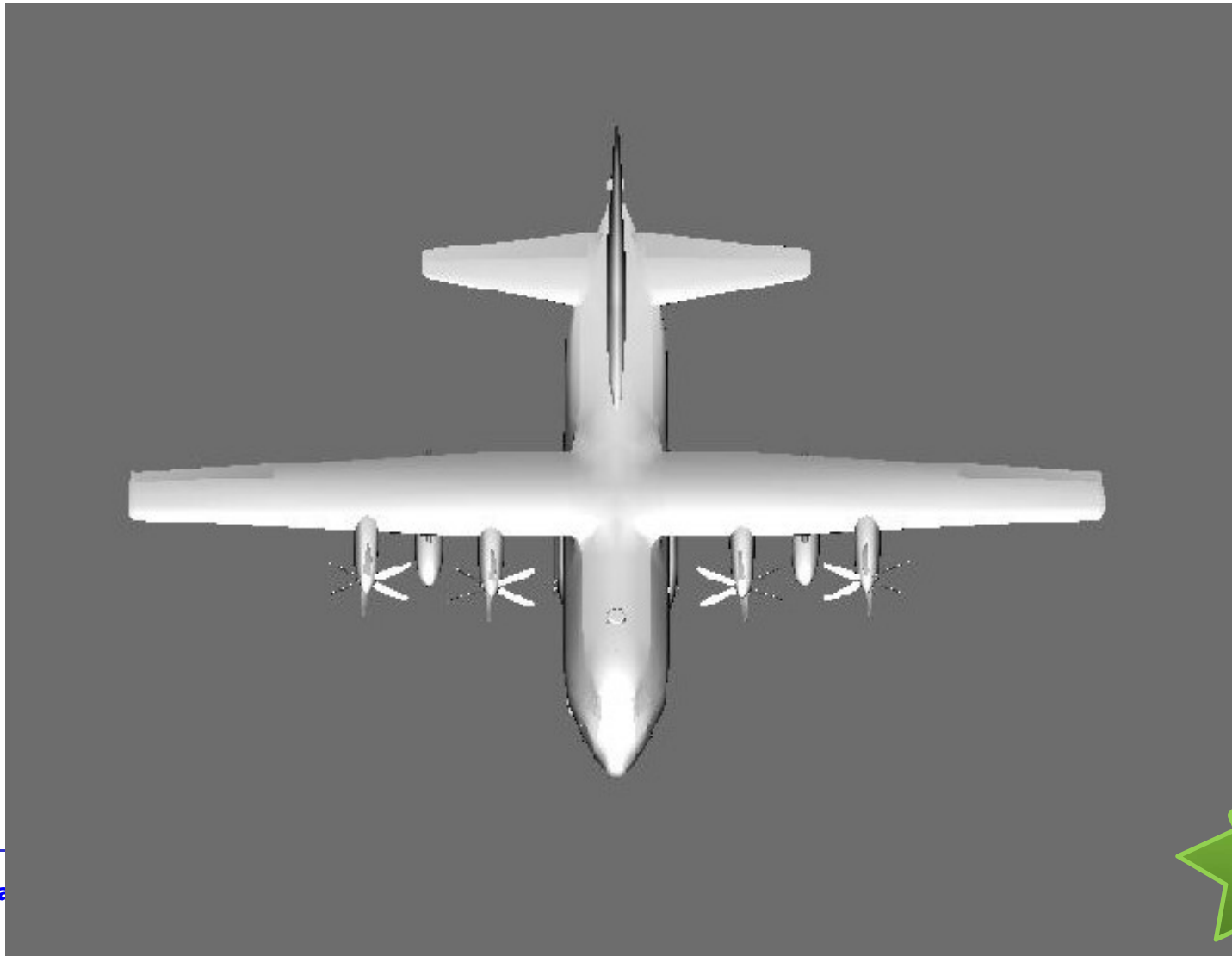
... and a virtual SAR look into the same future!

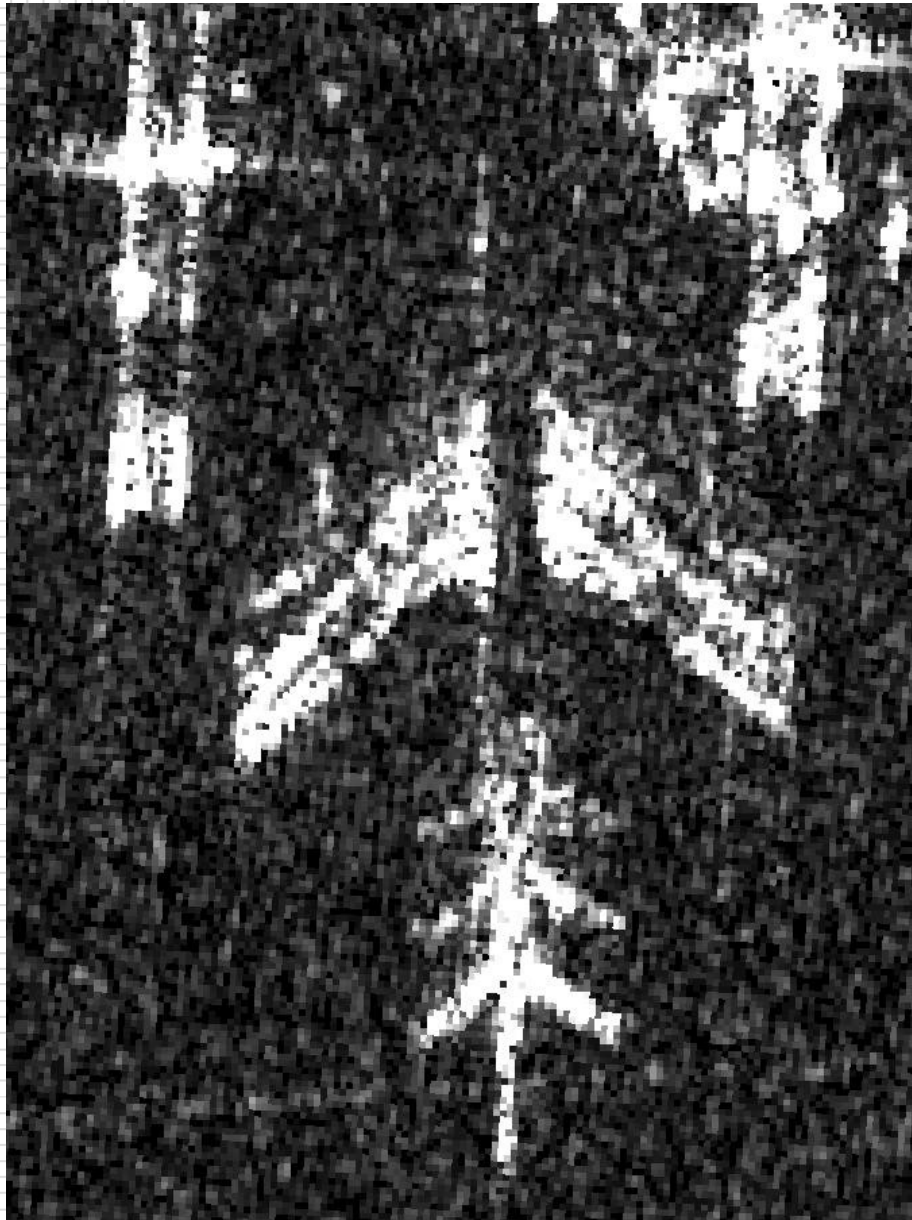


For natural...

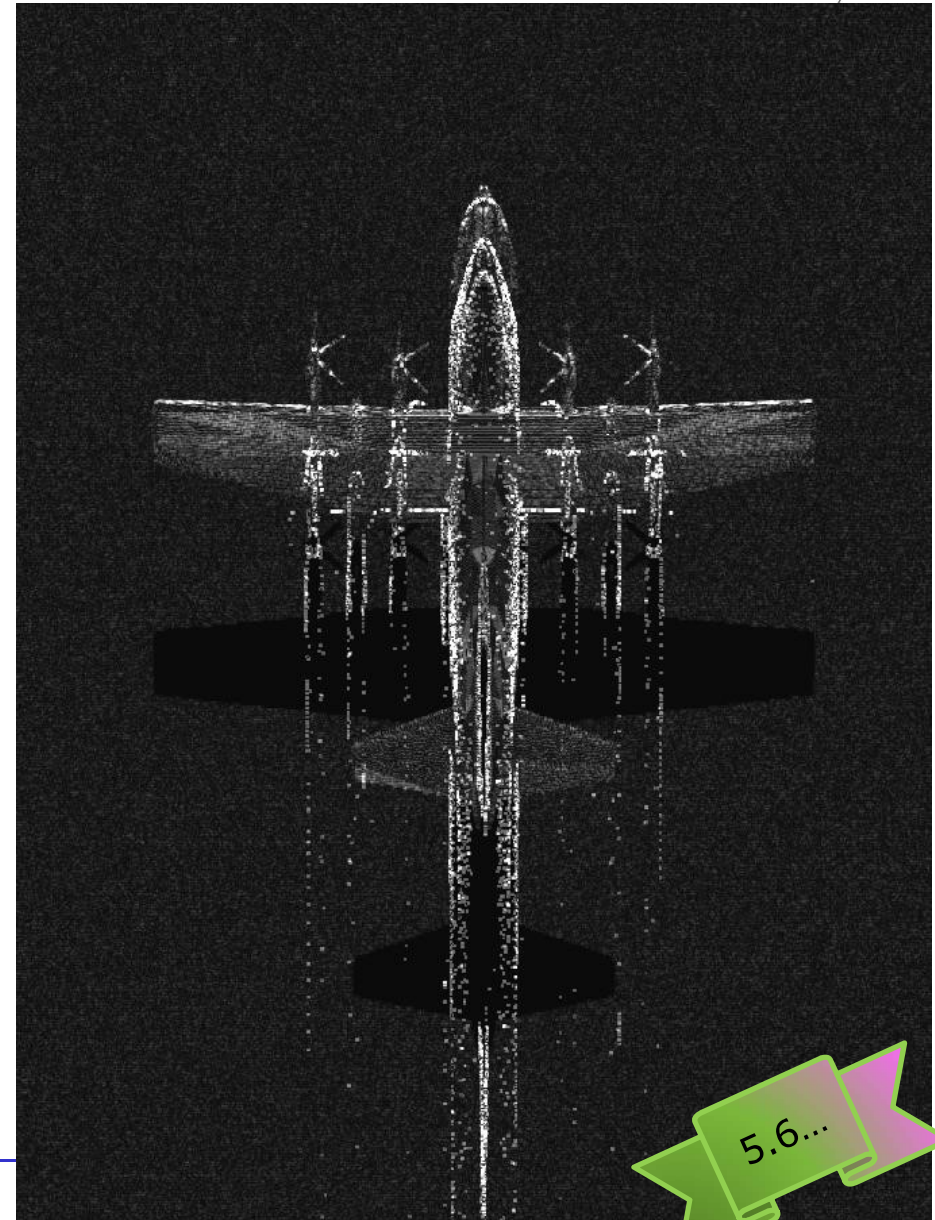


... as well as for man-made features





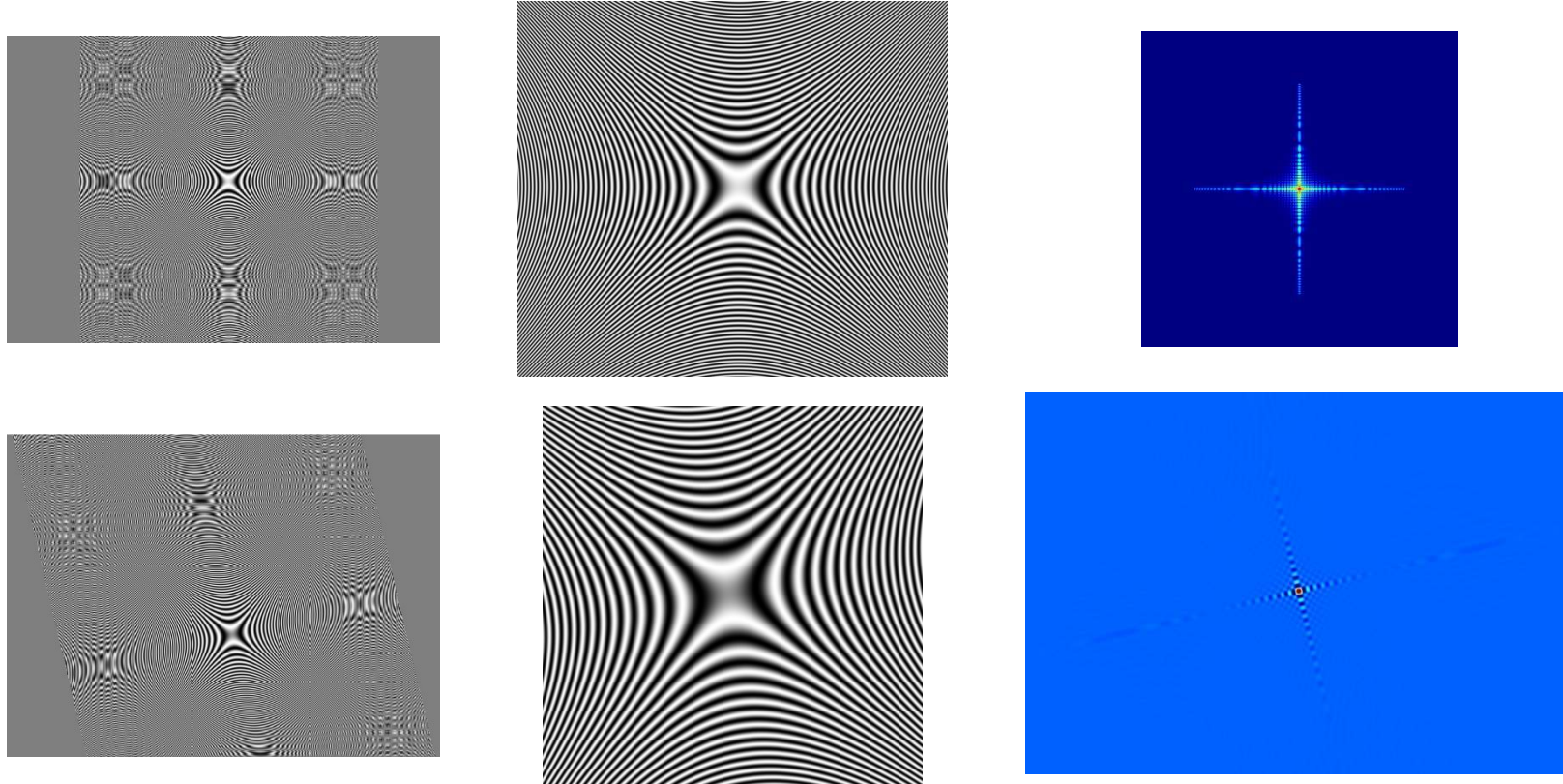
Cosmo-Skymed



SARscape

5.6...

And a well-focused future...!



Time-domain back-projection focusing
Verification processor, bistatic mode,
airborne (including motion compensation) etc.

ありがとうございました!!