

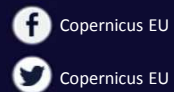


# Copernicus Land Monitoring Service

Submodule B: Combined value of HR Layers  
and 3D visualisation



Space



Copernicus EU

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[www.copernicus.eu](http://www.copernicus.eu)



Land  
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## CLMS SUBMODULE

# Introduction

- The 20m High Resolution Layers (HRLs) of the Pan-European component provide specific land cover characteristics, like imperviousness, forest/tree cover, grasslands, wetlands and permanent water bodies
- The combination with other Copernicus data (e.g. EU-DEM) and ancillary datasets enables various further applications

## Introduction of use case

- This demo aims to show the potential of the EU-DEM, in combination with CLMS HR Layers, for cartography, modelling, spatial analysis and image pre-processing.
- This will be shown by overlaying the HR layers on the EU-DEM, creating a 3D visualisation that facilitates analysis and interpretation.
- Freely available ancillary datasets from EEA and Eurostat enable further applications.

## Input Data

- High Resolution Layers 2012 in 20m spatial resolution
- EU-DEM v1.1
- HR/VHR Image Mosaics 2012
- 1km EEA Reference Grid
- Various datasets from Eurostat
  - *NUTS 2013*
  - *Airports 2013*
  - *Ports 2013*

## Introduction of demonstration

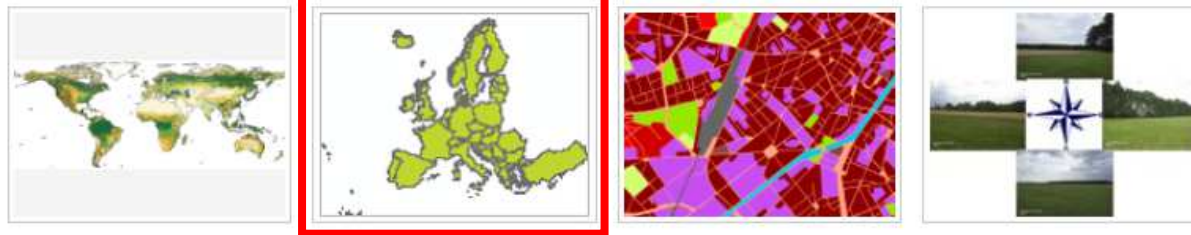
- Download of data
- 2D visualisation in GIS
- 3D impressions
- 3D flight visualisation



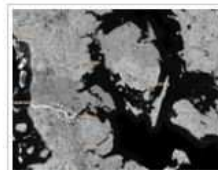
## Download of Copernicus High Resolution Layers (1)

- <http://land.copernicus.eu/>

Copernicus - The European Earth Observation Programme



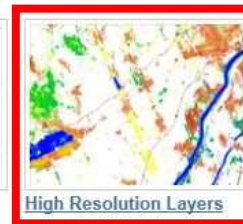
Pan-European



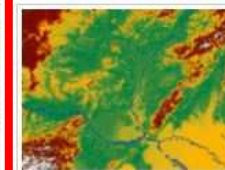
[Image Mosaics](#)



[CORINE Land Cover](#)



[High Resolution Layers](#)



[Reference Data](#)



[Related Pan-European products](#)



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## CLMS SUBMODULE

# Download of Copernicus High Resolution Layers (2)

### High Resolution Layers



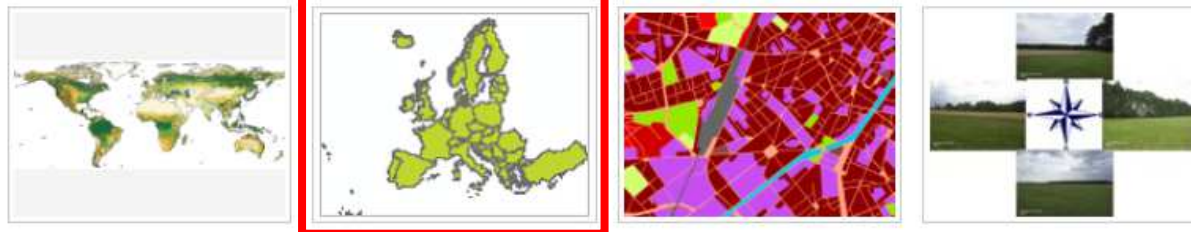
<input type="checkbox"/>	Name	Type	Resolution	Size	Download
<input checked="" type="checkbox"/>	IMD Full Mosaic 020m	Raster	20m	816.2 MB	
<input checked="" type="checkbox"/>	TCD Full Mosaic 020m	Raster	20m	7.4 GB	
<input checked="" type="checkbox"/>	FTY Full Mosaic 020m	Raster	20m	2.0 GB	
<input checked="" type="checkbox"/>	Grassland - EEA39 - 20m	Raster	20m	188.3 MB	
<input checked="" type="checkbox"/>	Wetlands - EEA39 - 20m	Raster	20m	170.2 MB	
<input checked="" type="checkbox"/>	Permanent Water Bodies - EEA39 - 20m	Raster	20m	172.0 MB	

Map View Metadata **Download**  
Legende Web services

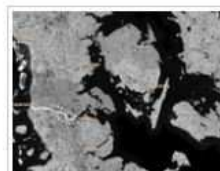
## Download of Copernicus Reference Data (1)

- <http://land.copernicus.eu/>

Copernicus - The European Earth Observation Programme



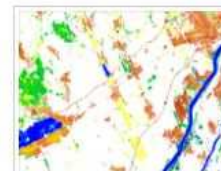
Pan-European



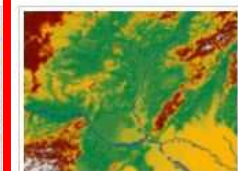
[Image Mosaics](#)



[CORINE Land Cover](#)



[High Resolution Layers](#)



[Reference Data](#)



[Related Pan-European products](#)





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## CLMS SUBMODULE

# Download of Copernicus Reference Data (2)

### Reference Data

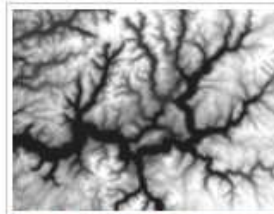


EU-DEM

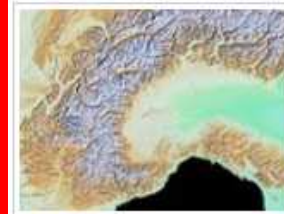


EU-Hydro

### EU-DEM



EU-DEM v1.0 and Derived  
Products



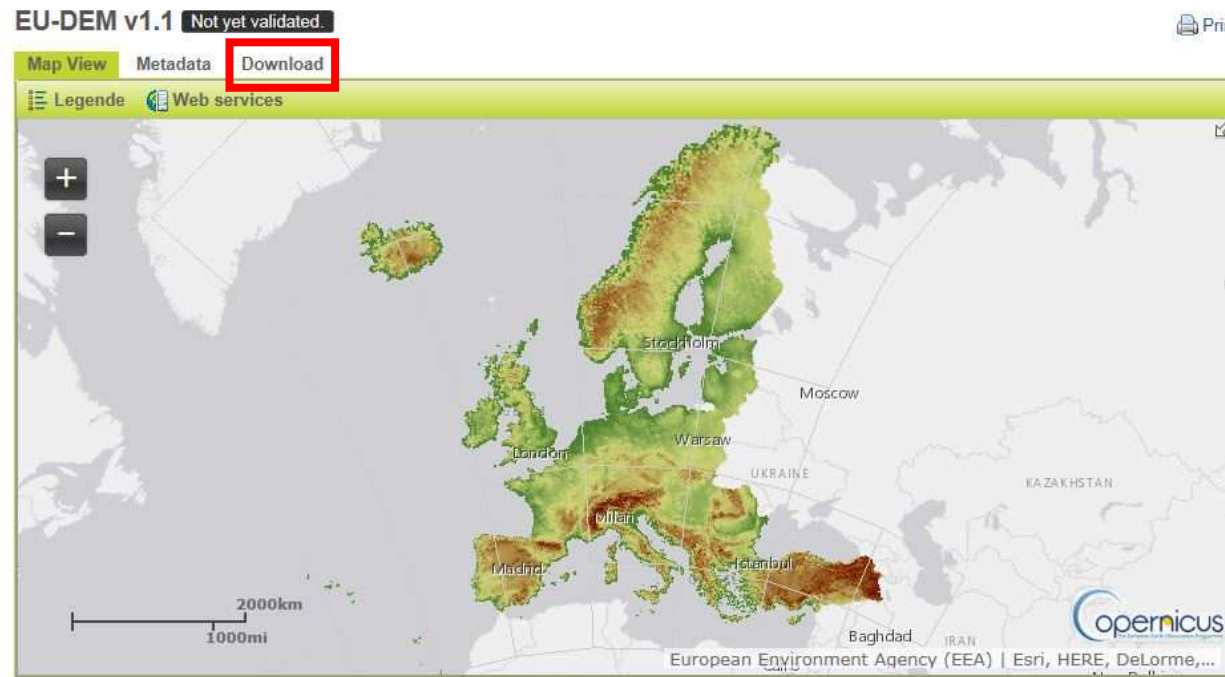
EU-DEM v1.1



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# Download of Copernicus Reference Data (3)



Copyright Copernicus Programme



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## CLMS SUBMODULE

# Download of Copernicus Reference Data (4)

EU-DEM v1.1 Not yet validated.

Print

[Map View](#) [Metadata](#) [Download](#)

Information about the different zones in which the dataset is divided can be found by clicking on the map in the Web View tab, where tiles can also be downloaded directly. The x,y-coordinates in the tiles are based on the EPSG:3035 (ETRS89-LAEA) projection. The 1000 x 1000 km tiles are provided as zipped GeoTIFF files with LZW compression. The raster with full European coverage is provided as zipped GeoTIFF files with DEFLATE compression. The colour shaded (RGB) DEM is only available in the full European coverage.

Spatially  
distributed  
tiles

Search: <input type="text"/>						
<input checked="" type="checkbox"/>	Name	Resolution	Size	Download		
<input checked="" type="checkbox"/>	DEM-v1.1-E00N20	25m	516.6 KB			
<input checked="" type="checkbox"/>	DEM-v1.1-E10N00	25m	7.8 MB			
<input checked="" type="checkbox"/>	DEM-v1.1-E10N10	25m	12.5 MB			
<input checked="" type="checkbox"/>	DEM-v1.1-E10N20	25m	5.4 MB			

☒ I am aware that I am downloading non-validated data and I accept to not distribute the information contained in these files or the files themselves any further.

Download selected items (27)

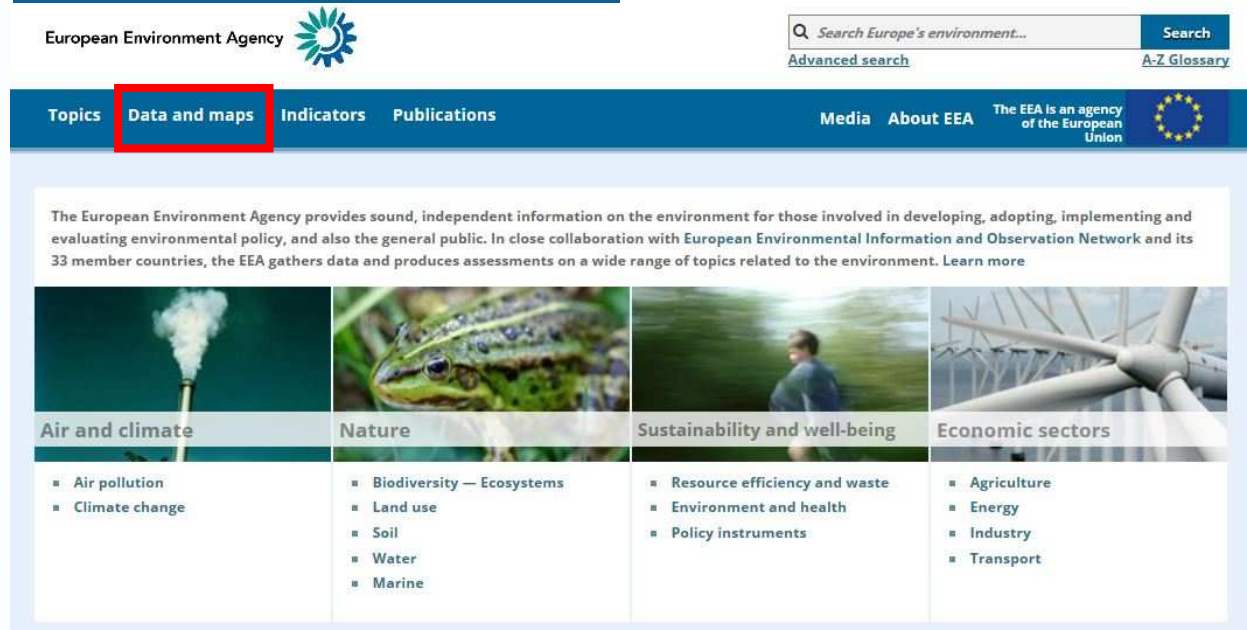
Download all

11



## Download EEA Reference Grid (1)

- <http://www.eea.europa.eu/>



European Environment Agency

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Topics **Data and maps** Indicators Publications Media About EEA The EEA is an agency of the European Union

The European Environment Agency provides sound, independent information on the environment for those involved in developing, adopting, implementing and evaluating environmental policy, and also the general public. In close collaboration with European Environmental Information and Observation Network and its 33 member countries, the EEA gathers data and produces assessments on a wide range of topics related to the environment. Learn more

Air and climate	Nature	Sustainability and well-being	Economic sectors
<ul style="list-style-type: none"> <li>Air pollution</li> <li>Climate change</li> </ul>	<ul style="list-style-type: none"> <li>Biodiversity — Ecosystems</li> <li>Land use</li> <li>Soil</li> <li>Water</li> <li>Marine</li> </ul>	<ul style="list-style-type: none"> <li>Resource efficiency and waste</li> <li>Environment and health</li> <li>Policy instruments</li> </ul>	<ul style="list-style-type: none"> <li>Agriculture</li> <li>Energy</li> <li>Industry</li> <li>Transport</li> </ul>



## Download EEA Reference Grid (2)

### Data and maps

#### Search data products

Advanced

Reference Grid

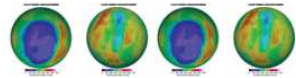


Search

#### Browse complete catalogue

All data products Datasets Maps Interactive maps Indicators Graphs

Filtered by All topics



Maximum historical  
depletion over the

Production and  
consumption of

Public awareness



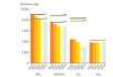
Reported data on  
large combustion



Mapping EU policies  
that influence land in



National emissions  
reported to the



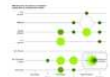
EU progress in  
meeting emission



State of bathing  
waters



Water exploitation  
index for river basin



Reported  
effectiveness of



### EEA reference grid

Data — Prod.ID: DAT-80-en — Created 23 May 2013 — Published 24 May 2013 — Last modified 03 Jul 2014, 09:49 AM



Topics: Policy instruments Biodiversity

The grid is based on the recommendation at the 1st European Workshop on Reference Grids in 2003 and later INSPIRE geographical grid systems. For each country three vector polygon grid shape files, 1, 10 and 100 km, are available. The grids cover at least country borders - plus 15km buffer - and, where applicable, marine Exclusive Economic Zones v7.0 - plus 15km buffer - (www.vliz.be/vmdcdata/marbound). Note that the extent of the grid into the marine area does not reflect the extent of the territorial waters.

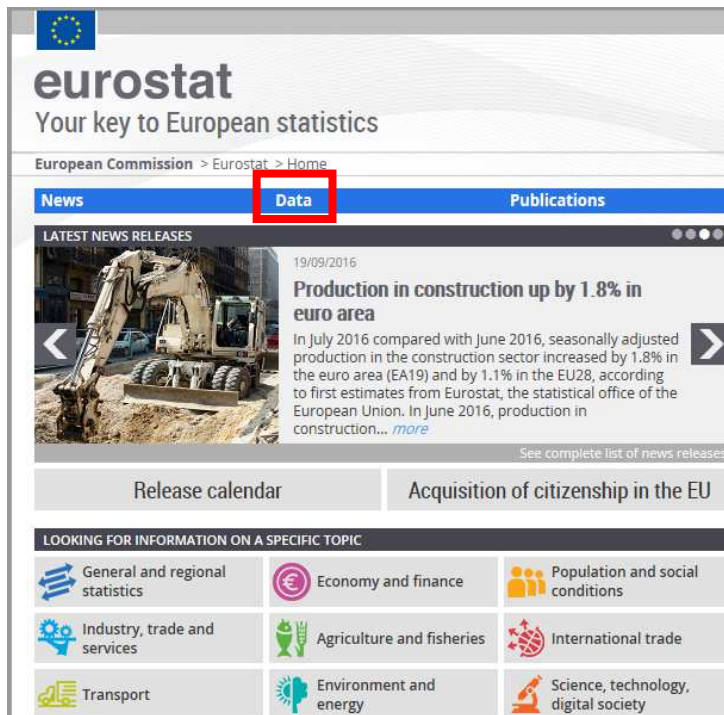
GIS data Additional information Metadata

#### GIS files

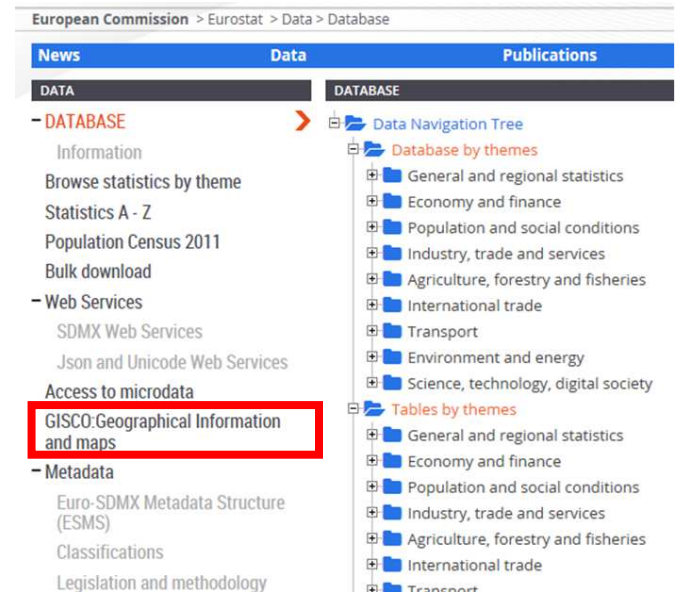
- Albania shapefile (ZIP archive)  
1.45 MB Download file
- Albania spatialite (ZIP archive)  
4.06 MB Download file
- Austria shapefile (ZIP archive)  
2.81 MB Download file
- Austria spatialite (ZIP archive)  
5.62 MB Download file
- Belgium shapefile (ZIP archive)  
1.28 MB Download file
- Belgium spatialite (ZIP archive)  
2.95 MB Download file

## Download of Eurostat Data (1)

- <http://ec.europa.eu/eurostat/en>



The screenshot shows the Eurostat website homepage. The header includes the European Commission logo and the text "eurostat Your key to European statistics". Below the header, there are navigation tabs for "News", "Data", and "Publications". The "Data" tab is highlighted with a red box. The main content area features a "LATEST NEWS RELEASES" section with a headline "Production in construction up by 1.8% in euro area" dated 19/09/2016. Below this, there are links for "Release calendar" and "Acquisition of citizenship in the EU". At the bottom, there is a section titled "LOOKING FOR INFORMATION ON A SPECIFIC TOPIC" with a grid of icons representing various statistical categories: General and regional statistics, Economy and finance, Population and social conditions, Industry, trade and services, Agriculture and fisheries, International trade, Transport, Environment and energy, and Science, technology, digital society.



The screenshot shows the "Data Navigation Tree" on the Eurostat website. The tree is organized into several sections: "DATABASE", "Web Services", "Access to microdata", "Metadata", and "Classifications". The "Access to microdata" section is highlighted with a red box, and within it, "GISCO: Geographical Information and maps" is also highlighted with a red box. The "Database by themes" section lists various statistical categories, including General and regional statistics, Economy and finance, Population and social conditions, Industry, trade and services, Agriculture, forestry and fisheries, International trade, Transport, Environment and energy, and Science, technology, digital society.



## Download of Eurostat Data (2)

### OVERVIEW

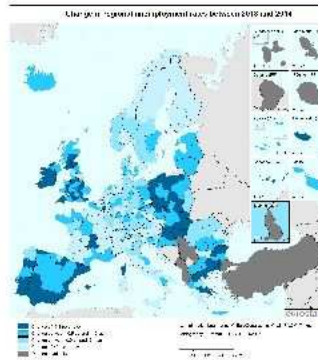
**GISCO - the Geographic Information System of the COMmission -**  
*localise, analyse, visualise*

#### What is GISCO?

Within Eurostat, GISCO is responsible for meeting the European Commission's geographical information needs at 3 levels: the European Union, its member countries, and its regions.

#### What does GISCO do?

In addition to creating statistical and other thematic maps, GISCO manages a **database** of geographical information, and provides related services to the Commission. Its database contains core geographical data covering the whole of Europe, such as administrative boundaries, and thematic geospatial information, such as population grid data. Some data are available for download by the general public and may be used for non-commercial purposes. For further details and information about any forthcoming new or updated datasets, see the **Geodata** section.



GISCO also coordinates Commission-wide geographical information activities. It seeks to promote the use of geographical information and the geographical information system (GIS) within the European Statistical System (ESS) and the Commission. GISCO therefore chairs the working group on the integration of statistical and geospatial information, which includes representatives of National Statistical Institutes (NSI) and National Mapping and Cadastral Authorities (NMCA). For further information, see the GISCO activities section.

#### Geodata available:

##### Administrative units / Statistical units:

- NUTS 2013
- NUTS 2010
- NUTS 2006
- NUTS 2003
- Urban audit 2011-2014
- Urban audit 2004
- Urban audit 2001
- Countries 2014
- Countries 2013
- Countries 2010
- Countries 2006
- Census centroids 2011
- Census units 2011
- Communes 2013
- Communal centroids 2010
- Communal centroids 2006

##### Population Distribution / Demography:

- GEOSTAT 1 km<sup>2</sup> Population grid
- Urban Clusters
- Degree of Urbanisation

##### Transport networks:

- Airports
- Ports

##### Land cover:

- Land Use /Cover Area frame Statistical Survey (LUCAS)
- Corine Land Cover (CLC)
- Urban Morphological Zones (UMZ)

##### Elevation (DEM):

- EU DEM (DD)
- EU DEM (LAEA)
- Aspect
- Slope
- Coloured Relief
- Hillshade
- Hydrography (LAEA)
- Hydrography (ETRS1989)
- RMS

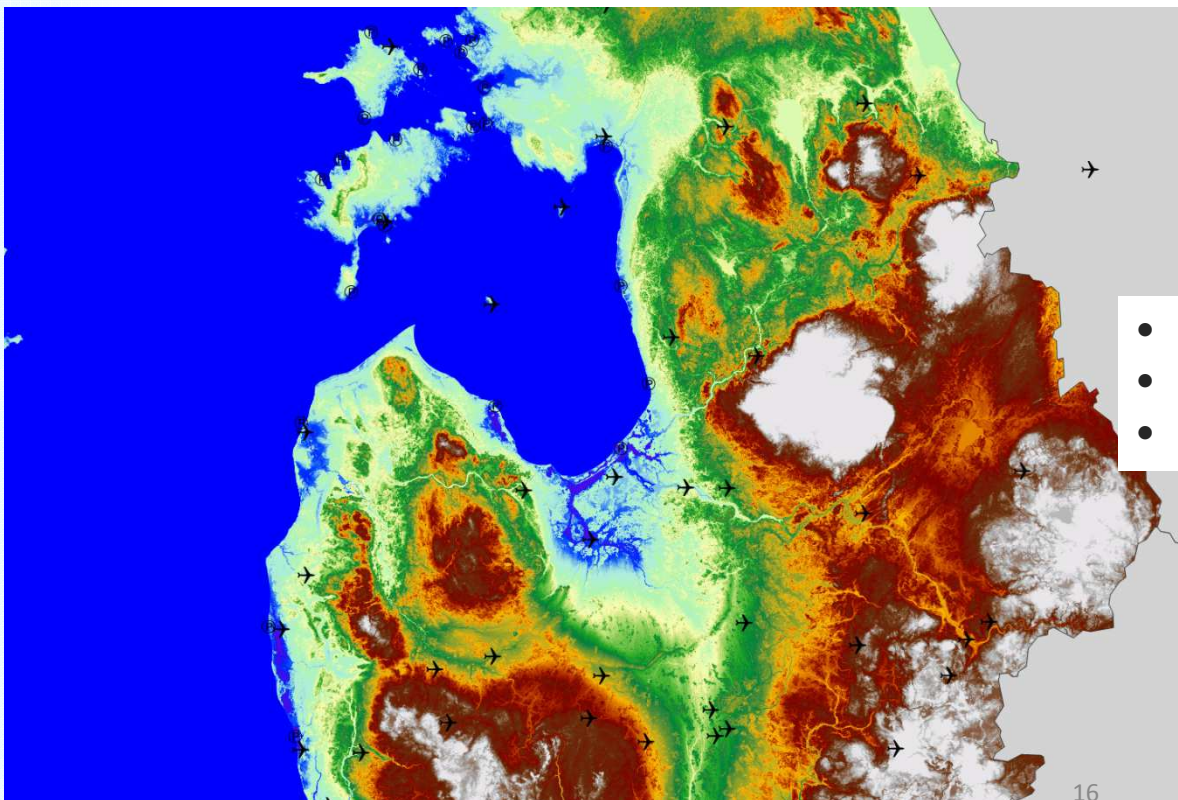




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### 2D Visualisation – The Baltic States



- EU-DEM v1.1
- Airports (2013)
- Ports (2013)

16

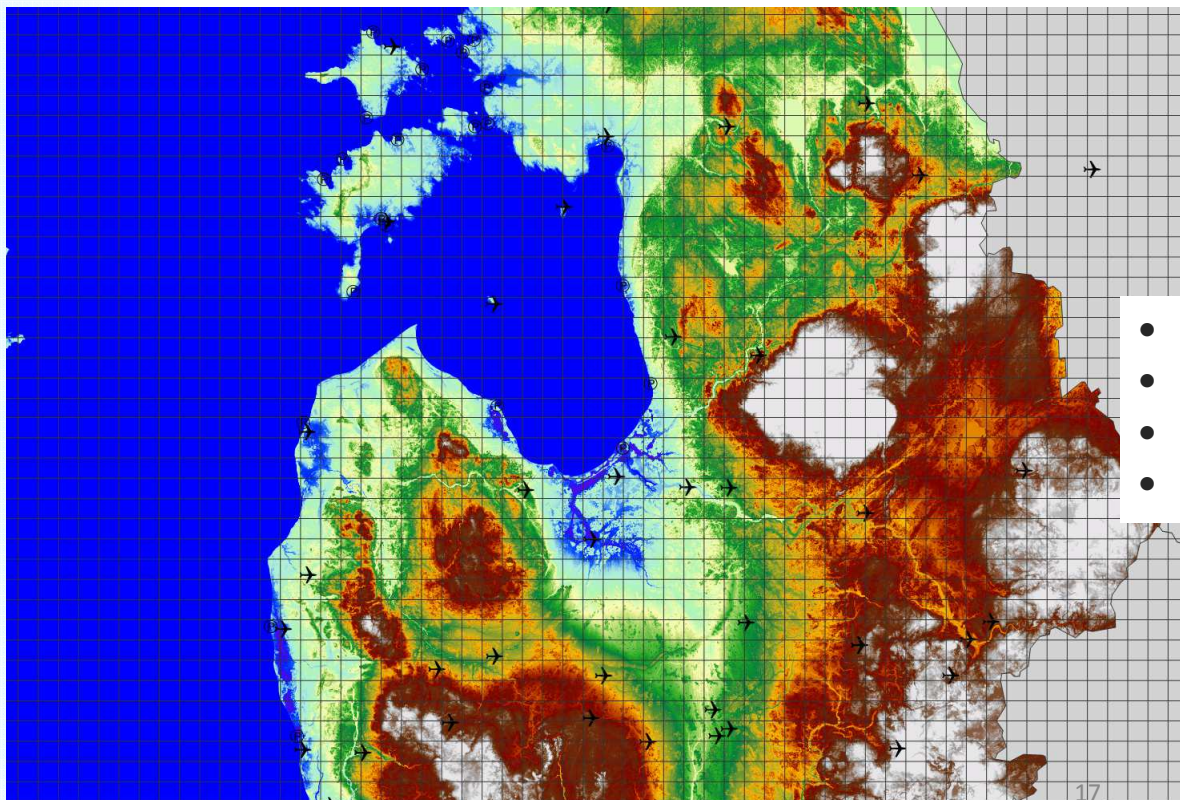
© European Union, 1995 - 2017

Copernicus  
Europe's eyes on Earth





## 2D Visualisation – Latvia



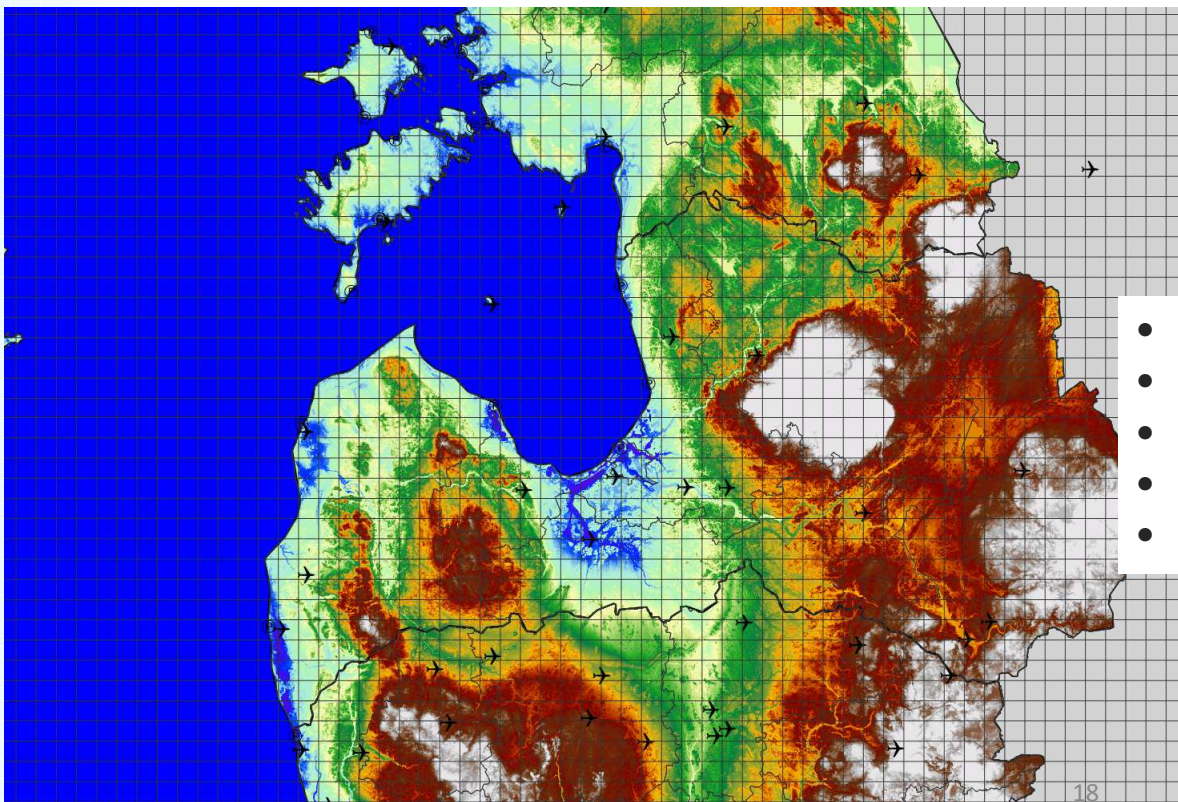
- EU-DEM v1.1
- Airports (2013)
- Ports (2013)
- 10 km EEA reference grid



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## CLMS SUBMODULE

### 2D Visualisation – Latvia



- EU-DEM v1.1
- Airports (2013)
- Ports (2013)
- 10 km EEA reference grid
- NUTS (2013)

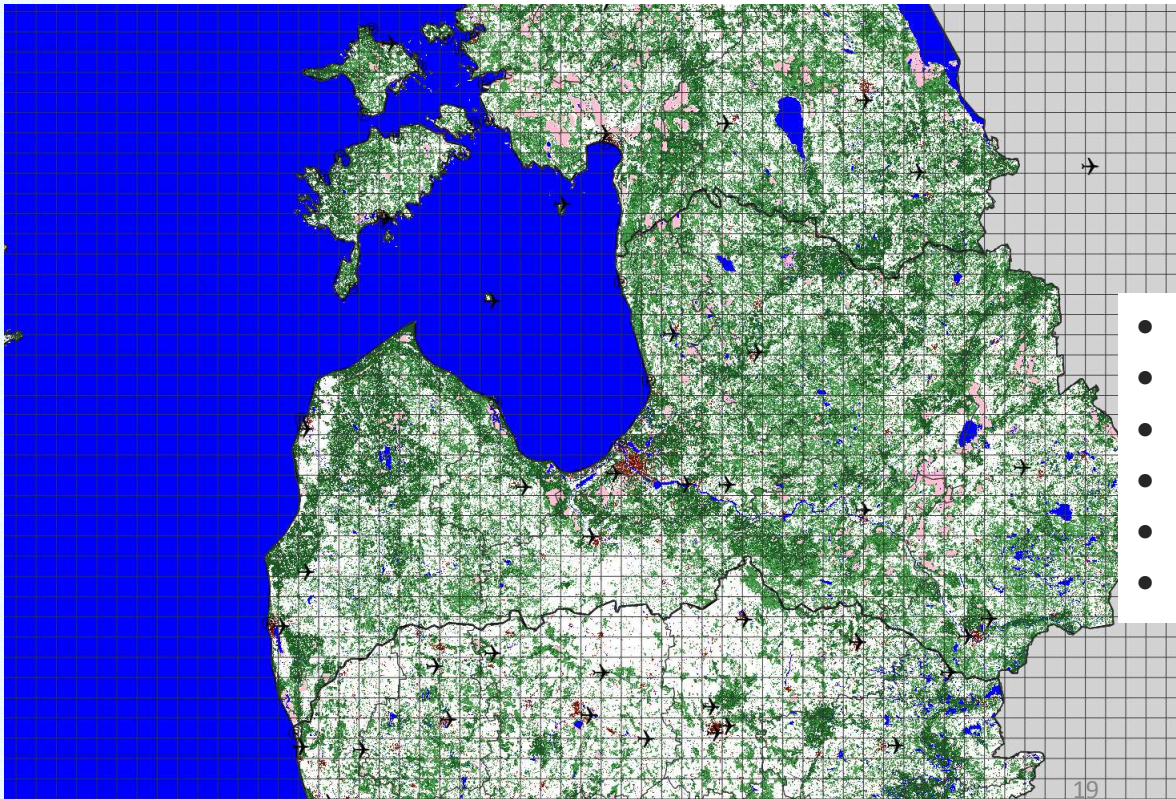
© European Union, 1995 - 2017 © EuroGeographics for the administrative boundaries

Copernicus  
Europe's eyes on Earth





## 2D Visualisation – Latvia



- EU-DEM v1.1
- Airports (2013)
- Ports (2013)
- 10 km EEA reference grid
- NUTS (20149)
- Copernicus HRLs (2012)



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## CLMS SUBMODULE

### 3D Impressions – False colour Image 2012 (Riga)



CORE\_01 (HR Image 2012)

- 20m HR mosaic
- 810 IRS-P6 scenes
- False-colour infrared
- Geom. accuracy:  $\pm 20\text{m}$
- Image data base for Copernicus HRLs 2012



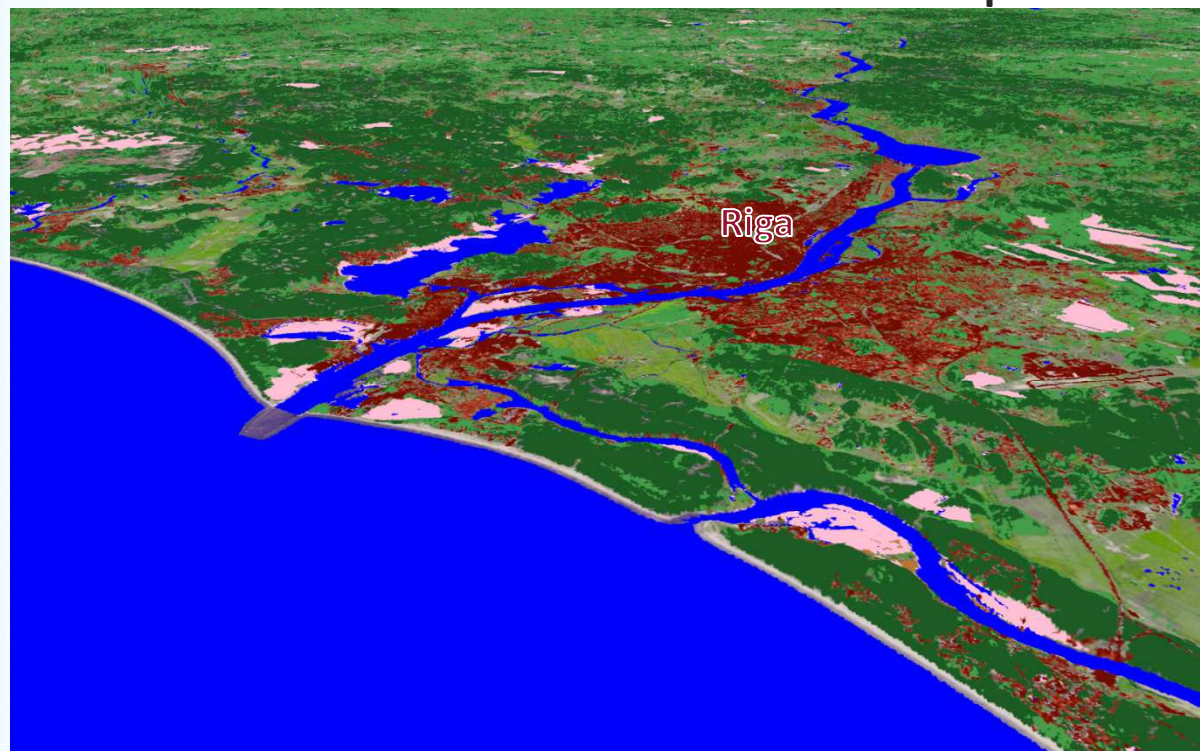
## 3D Impressions – True colour VHR CORE\_03 (Riga)



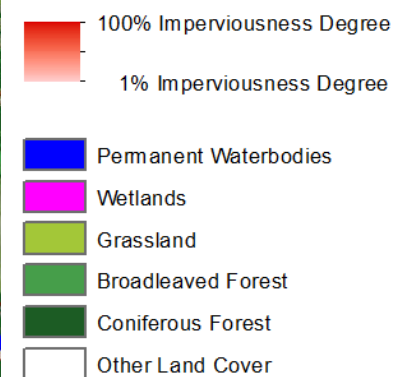
CORE\_03 (VHR Image 2012)

- 2.5m VHR mosaic
- > 3,900 SPOT-5 scenes
- pseudo-true colour
- Geom. accuracy:  $\pm 5\text{m}$
- Image data base for local component (e.g. Natura2000)

## Demonstration – 3D View with Copernicus HRLs



### Legend





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# 3D Flight Visualisation

Example from the Copernicus  
Training and Information Session Athens  
(07/10/2016)

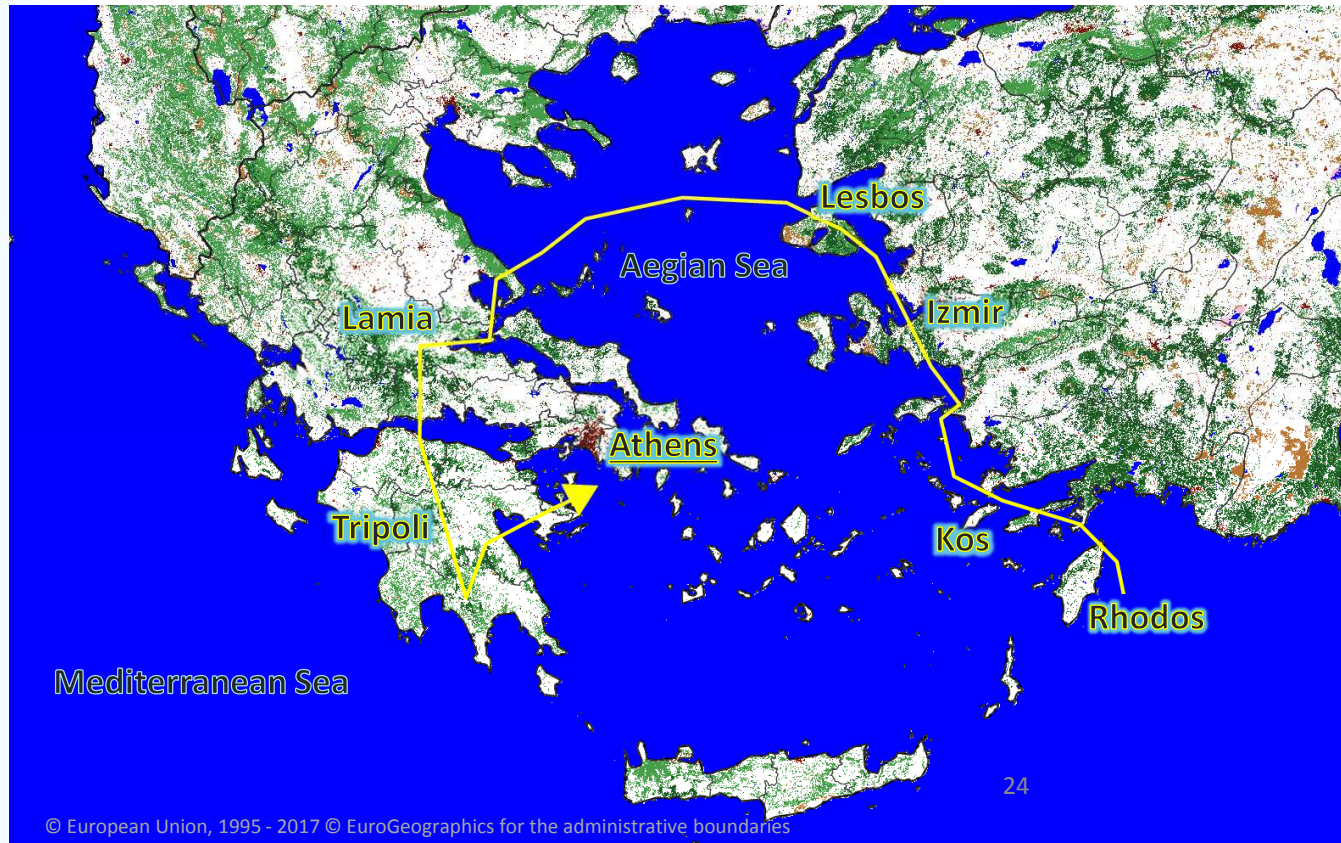




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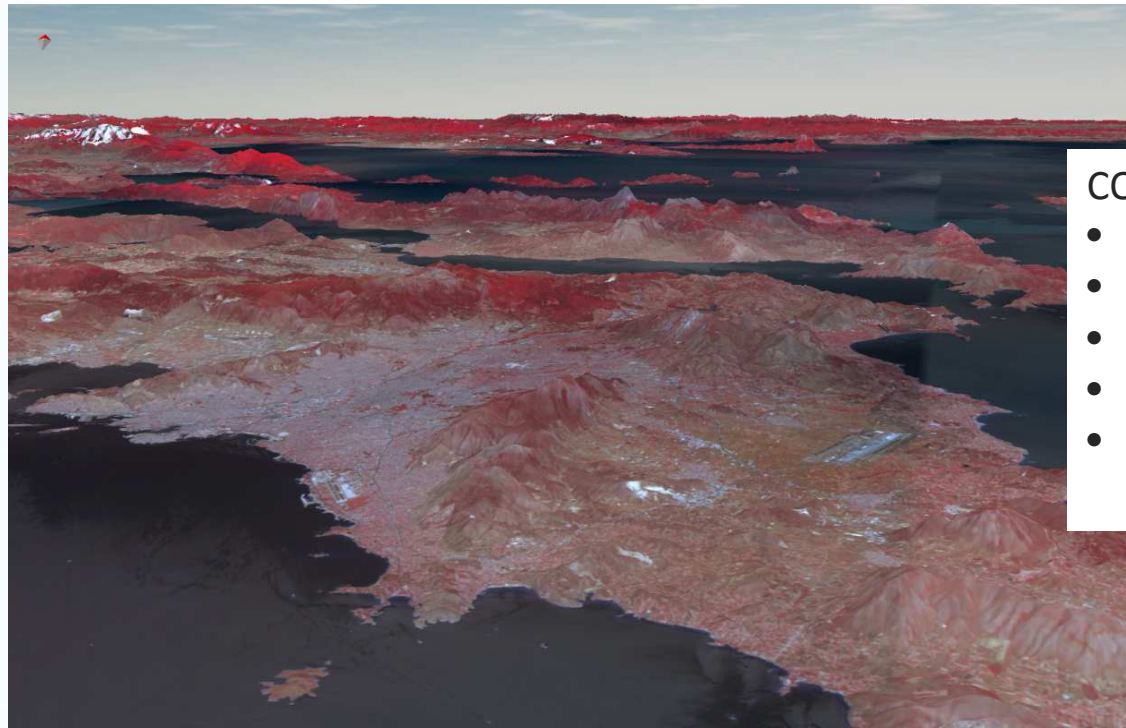
## CLMS SUBMODULE

### 2D Visualisation – Flightline





## 3D Impressions – False colour Image 2012 (Athens)



CORE\_01 (HR Image 2012)

- 20m HR mosaic
- 810 IRS-P6 scenes
- False-colour infrared
- Geom. accuracy:  $\pm 20\text{m}$
- Image data base for Copernicus HRLs 2012



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## CLMS SUBMODULE

### 3D Impressions – True colour VHR CORE\_03



CORE\_03 (VHR Image 2012)

- 2.5m VHR mosaic
- > 3,900 SPOT-5 scenes
- pseudo-true colour
- Geom. accuracy:  $\pm 5\text{m}$
- Image data base for local component (e.g. Natura2000)

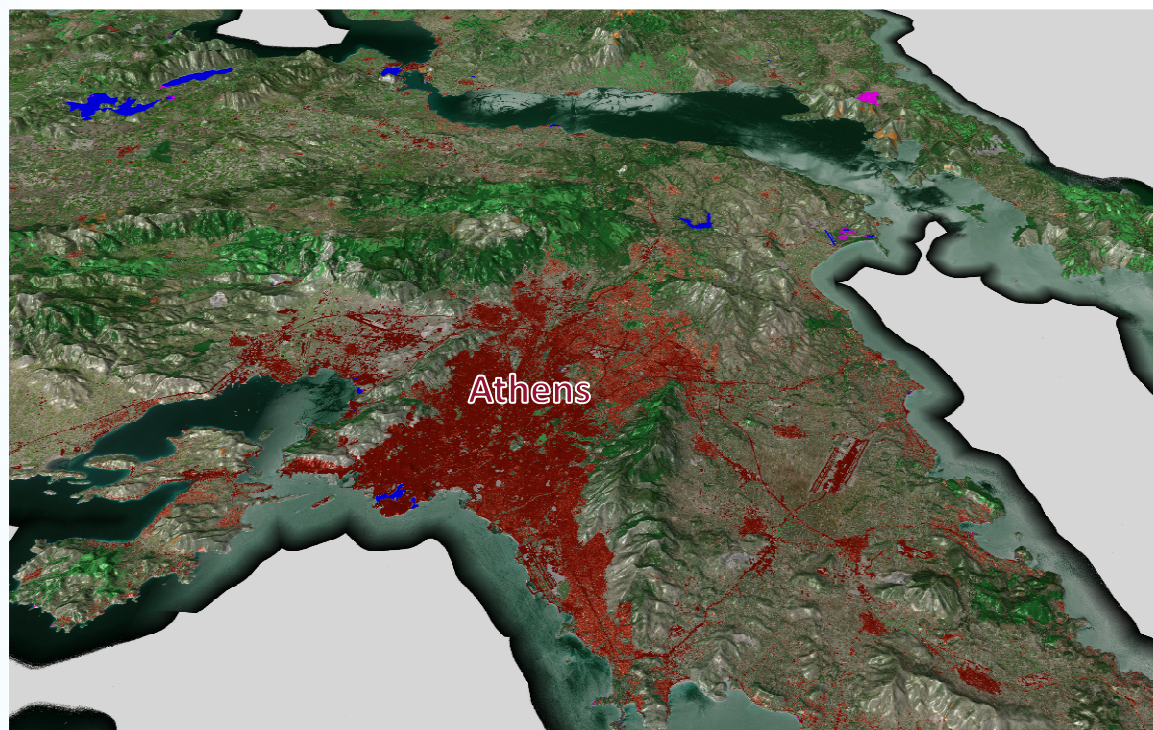




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## Demonstration – 3D Flight Simulation



### Legend

- 100% Imperviousness Degree
- 1% Imperviousness Degree
- Permanent Waterbodies
- Wetlands
- Grassland
- Broadleaved Forest
- Coniferous Forest
- Other Land Cover



