Portugal

Directorate General for the Territory

Delivering state-of-the-art remote sensing data for Portugal

"Remote sensing data is crucial for several sectors in Portugal. LiDAR data and very high-resolution satellite imagery acquired by modern sensors are an opportunity for obtaining very accurate spatial datasets, besides being a quick process to provide users with updated spatial information about the country. All these open datasets will promote a better knowledge of the territory. They will also encourage the development of further cartographic products useful for numerous public and private sector activities, in particular thematic and topographic cartography, land planning, forestry, water resources, land use and research, to mention just a few."

Fernanda do Carmo
General Director,
Directorate General for
the Territory, Portugal

Two new highly accurate open datasets created using state-of-the-art sensors are promoting a better understanding of continental Portugal.

The important landmark in remote sensing data is being achieved through LiDAR (Light Detection and Ranging), and very high spatial resolution satellite imagery coverage delivered by the Directorate General for Territory (DGT)

For decades, DGT has been regularly producing high resolution orthophotos using aerial photography of continental Portugal. The Azores and Madeira islands are not included and have specific coverages acquired by the regional public administration entities.

In 2021, it was decided to diversify these remote sensing data and to obtain derived products using different kinds of sensors for continental Portugal. Production of two datasets providing LiDAR and high spatial resolution satellite imagery began in 2023.

The LiDAR coverage is ongoing and is scheduled to end by the first trimester of 2025. The satellite imagery coverage from Pléiades Neo sensors was obtained during 2023 and the orthomosaics produced from these images will be available by the fourth trimester of 2024. Both products will be available for users free of charge.

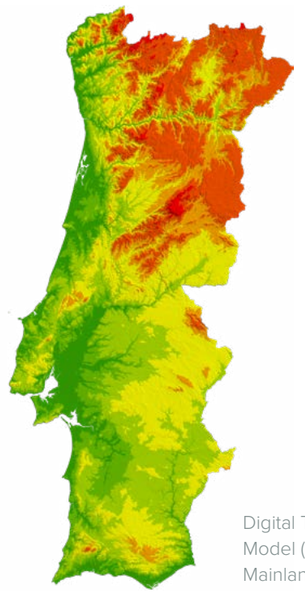
Pléaides Neo sample image
Castro Marim, Portugal

LiDAR coverage main specifications:

- Full territorial coverage of continental Portugal
- Point Density: 10 points per m^2
- Vertical accuracy better than 10 cm
- Full waveform LiDAR data
- Additional 25 cm resolution aerial photography (4 bands – RGB and NIR) obtained simultaneously.

Very high-resolution satellite images specifications:

- Full territorial coverage of continental Portugal
- Sensors: Pléiades Neo 3 and Pléiades Neo 4
- Panchromatic and 6 multispectral bands including, Red, Green, Blue, Near-Infrared, Red-Edge and Deep Blue
- Spatial resolution of 30 cm for the panchromatic image and 1.2 m for the multispectral images
- Radiometric resolution12 bits.



Digital Terrain
Model (DTM)
Mainland Portugal

Benefits

- Creates complementary information resources suitable for several applications.

LiDAR data

- Allows the generation of high-resolution Digital Terrain and Surface Models, as well as hydrographic 3D networks.
- Helps significantly the production of vector topographic maps for 3D themes, contributing to future integration with the National Cartographic Database (BDNC).

Satellite imagery from Pléiades Neo sensors

- Plays a decisive role in the production of thematic cartography, including the Land Cover Land Use Map (COS) produced regularly by DGT.
- Provides an opportunity to apply automatic classification algorithms with very high-resolution satellite images to characterise land cover with unprecedented detail on a large scale.