



Copernicus for Renewable Energy

Define zone of visual influence of wind turbines



User
Uptake

U s e C a s e

- In many countries, the visual influence of a wind farm on the landscape is an important issue, especially in regions with a high population density.
- From a Digital Elevation Model (D.E.M) describing the topography, tools can delineate the zone of visual influence (ZVI) or visibility footprint.
- This session will access the EU-DEM reference data of the CLMS (Copernicus Land Monitoring Service) and use this data in a GIS.



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Uptake

H a n d s - o n d e m o

- Get DEM from Copernicus: <https://land.copernicus.eu/imagery-in-situ/eu-dem/eu-dem-v1.1/view>
- Select the area of interest
- Download and decompress
- Visualize the map with QGIS
- Add location of wind turbine
- Delineate the zone of visual influence



- The EU-DEM v1.1 is a resulting dataset of the EU-DEM v1.0 upgrade which enhances the correction of geo-positioning issues.
- EU-DEM v1.1 is a contiguous dataset divided into 100x100 km tiles, resulting in a total of 1992 tiles at 25m resolution with vertical accuracy +/- 7 meters.
- EU-DEM v1.1 data are single band raster with values relating to the actual elevation.
- The EU-DEM map shows a colour shaded relief image over Europe, which has been created by the EEA.
- The dataset is encoded as GeoTIFF easily importable to common G.I.S.



Land
Monitoring

Video 1: Get elevation model

Copernicus Land Monitoring Service

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Copernicus is a European system for monitoring the Earth. Data is collected by different sources, including Earth observation satellites and in-situ sensors. The data is processed and provides reliable and up-to-date information in six thematic areas: land, marine, atmosphere, climate change, emergency management and security. The land theme is divided into four main components:

- Global**
provides a series of bio-geophysical products on the status and evolution of the land surface at global scale at mid and low spatial resolution
- Pan-European**
provides information about the land cover and land use (LC/LU), land cover and land use changes and land cover characteristics
- Local**
focuses on different hotspots, i.e. areas that are prone to specific environmental challenges and problems
- Imagery and reference data**
Satellite imagery forms the input for the creation of Copernicus land products. In order to ensure an efficient and effective use of satellite data the Copernicus land monitoring service needs access to in-situ data

Latest news

European land monitoring at its crossroads – opportunities and challenges

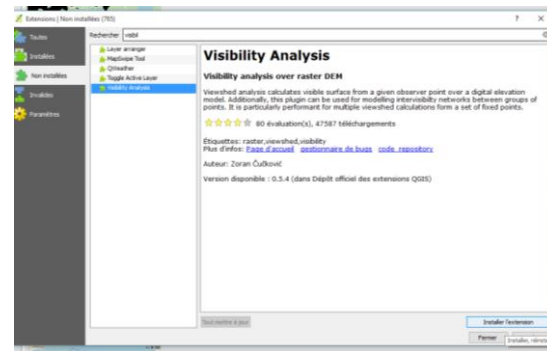
LIVESTREAM: European land monitoring at its crossroads – opportunities and challenges



Visibility footprint tools

Viewshed analysis calculates visible surface from a given observer point over a digital elevation model.

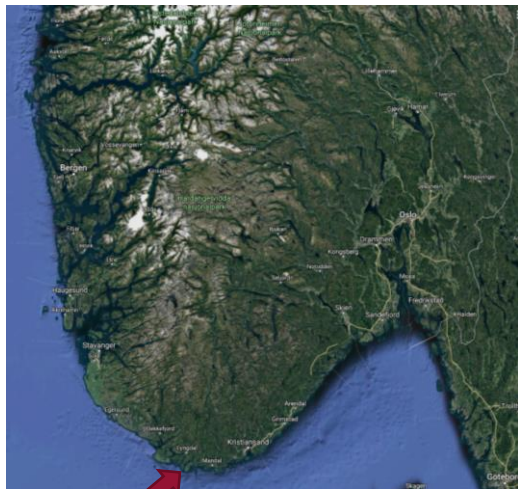
- GRASS library
 - r.viewshed : Computes the viewshed of a point on an elevation raster map.
 - r.lost : line of sight raster analysis program
- SAGA library
 - viewshed module
- QGIS plug-in:
 - **Advanced visibility analysis tool:**
 - It is particularly performant for multiple viewshed calculations from a set of fixed points.
 - This plug-in must be installed from the standard QGIS plugin library.





Land
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Tomstad wind farm





Video 2: Compute Zone of visibility in QGIS

