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In collaboration with:

INTERMAP®

BRIEF REPORT

SOLAR FARM SITE ASSESSMENT

HAUTES-ALPES AND ALPES-DE-HAUTE-PROVENCE DEPARTMENTS, 2023

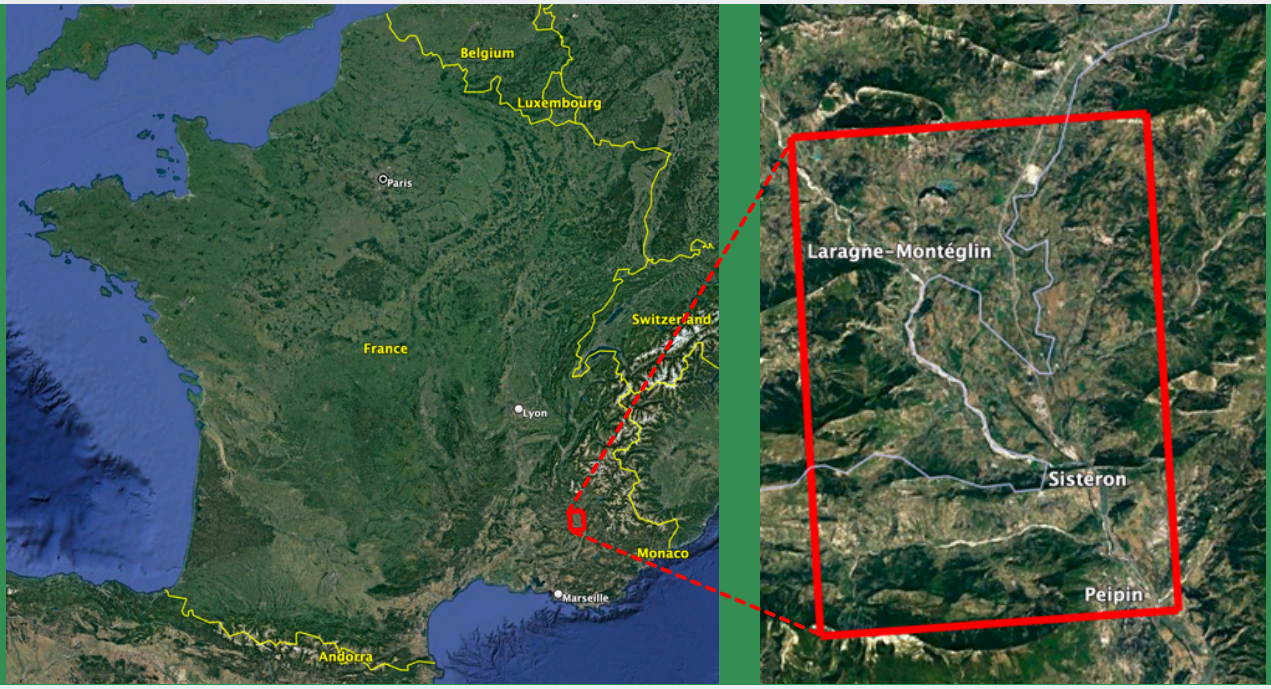
France

Solar parks in Southern France

Solar parks in the southern French Alps are causing deforestation as natural areas are cleared for the installation of solar panels. The practice has raised concerns among local citizens and environmental groups. The Hautes-Alpes and Alpes-de-Haute-Provence regions have seen a surge in solar farm projects due to favourable conditions of abundant sunshine and cool temperatures. However, these projects encroach on forest land, which has prompted calls for priority to be given to built-up land for solar installations rather than agricultural or forest land.

Elevation products play a crucial role in assisting solar farm site selection. ding accurate and detailed information about the topography of an area, elevation data helps in identifying suitable locations for solar farm development. These products enable the assessment of terrain characteristics, such as slopes and aspect, which directly impact solar energy potential.

Together with Intermap, Cloudeo conducted a solar farm site assessment within a region of Hautes-Alpes and Alpes-de-Haute-Provence in Southern France. The two companies exploited the very high resolution elevation data of NEXTMap One™ (1m pixel size) to detect the best locations over this area for a solar farm installation - not only in terms of topography suitability, but also of land cover type. Areas identified as croplands and forests have been excluded from the analysis.



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Why elevation?

Elevation data can assist in the site suitability assessment for a solar farm installation. With elevation data, solar developers can analyze shading patterns, optimize panel placement, and maximize energy production. Additionally, elevation products aid in evaluating potential risks, such as flooding or unstable ground conditions, ensuring site suitability and reducing project setbacks. By leveraging elevation data, solar farm site selection becomes a more informed and efficient process, leading to the identification of optimal locations with high solar resource potential and minimized environmental impact.

Here's why it matters:

Solar Irradiance Optimization

By analyzing elevation data, we can assess the slope and orientation of the land, allowing us to identify areas with optimal solar irradiance. This ensures that your solar panels receive the maximum amount of sunlight throughout the day, resulting in higher energy production and increased financial returns.

Shade Analysis

Accurate elevation data enables us to conduct precise shade analysis. By identifying potential obstructions such as trees, buildings, or other structures, we can determine the shading impact on your solar array. This information helps us design an efficient layout that minimizes shade and maximizes energy generation.

Terrain Evaluation

Elevation data aids in evaluating the terrain of potential sites. We can identify areas with a gentle slope, which simplifies installation and maintenance processes. Additionally, this data helps in identifying areas prone to flooding or other environmental constraints, allowing us to avoid unsuitable locations and reduce potential risks.

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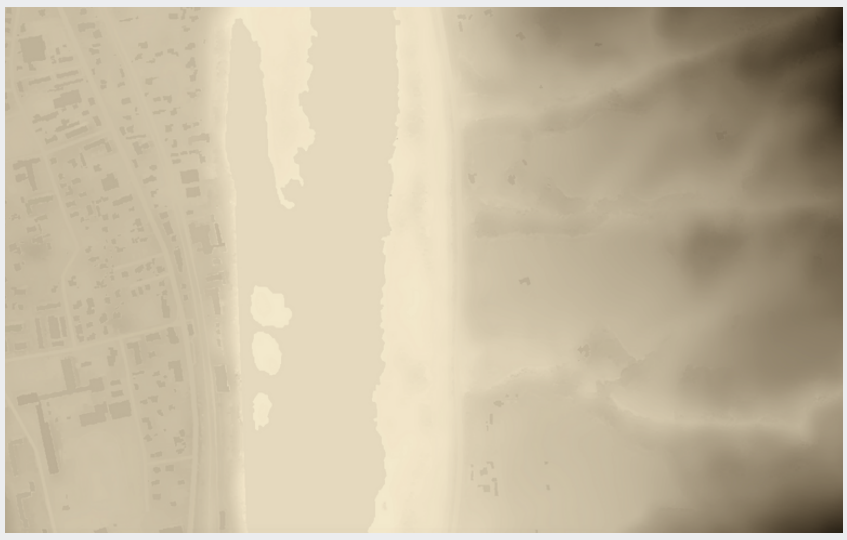
DSM or DTM?

For the solar farm site assessment, NEXTMap One elevation data was used. It provides up to 1-meter resolution elevation data for any location in the world.

Furthermore, it comes as both Digital Surface Model (DSM) and Digital Terrain Model (DTM). NEXTMap One DSM provides detailed surface elevations derived from terrain, vegetation, and man-made features like buildings and infrastructure. On the other hand, NEXTMap One™ DTM focuses solely on the bare earth, with all other surface features removed.

Subregion of study area (Bing Maps).

Digital Terrain Model (NEXTMap One). It shows only the bare earth.



Digital Surface Model (NEXTMap One). It includes surface elevations from terrain, vegetation, and manmade features, such as buildings and infrastructure.

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Data analysis

Slope and aspect are crucial factors to consider for solar farm installation, as they directly impact the energy production and efficiency of the solar panels. In France, the recommended slope ranges from 20 to 35 degrees to maximize energy production throughout the year. In terms of aspect, a south-facing orientation is preferred for solar installations in France. South-facing panels receive the maximum amount of direct sunlight, especially during the peak sunlight hours of the day. This aspect maximizes the solar panel's exposure to sunlight, resulting in higher energy yields and improved system performance.

Topography factors for France

20°- 35°

METHODOLOGY

Calculation of slope and aspect

Elimination of areas covered by croplands and forest areas

Zonal analysis and statistics calculation

Cost-effective and accurate extraction of areas suitable for solar farm installations

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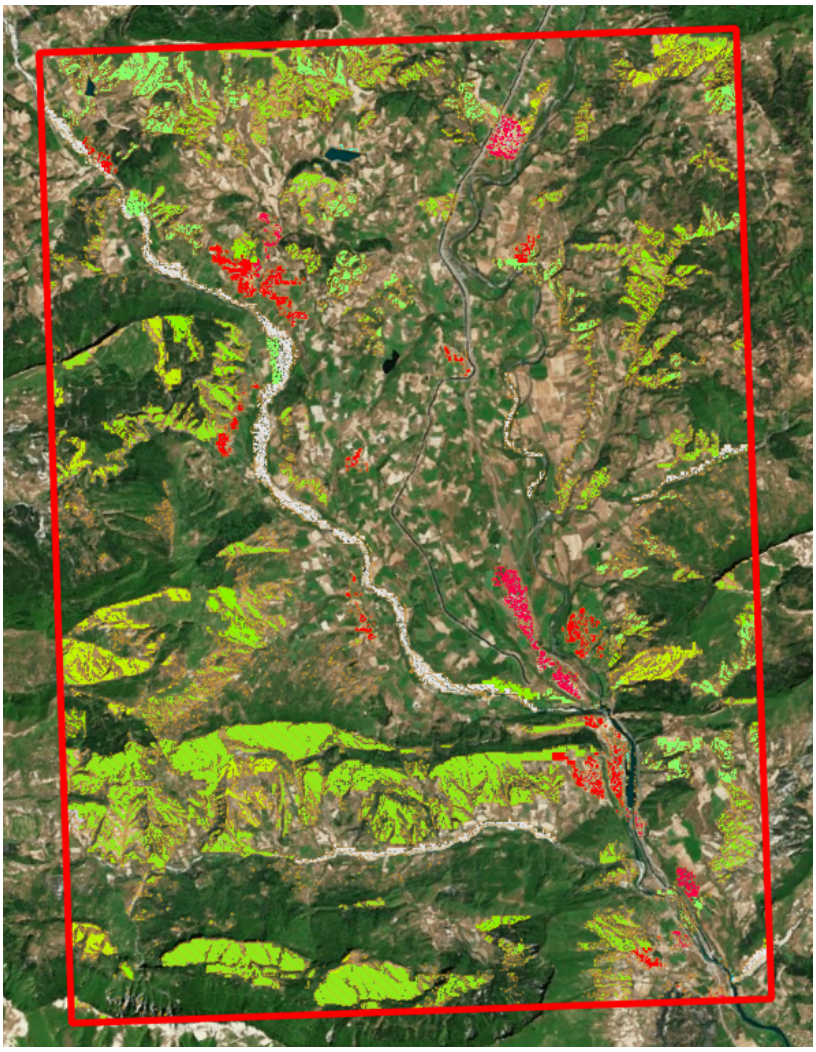
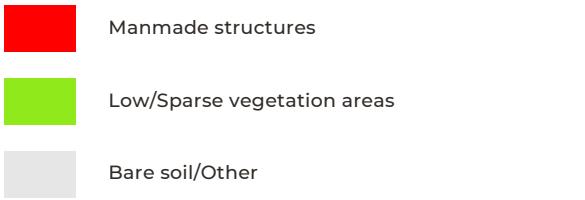
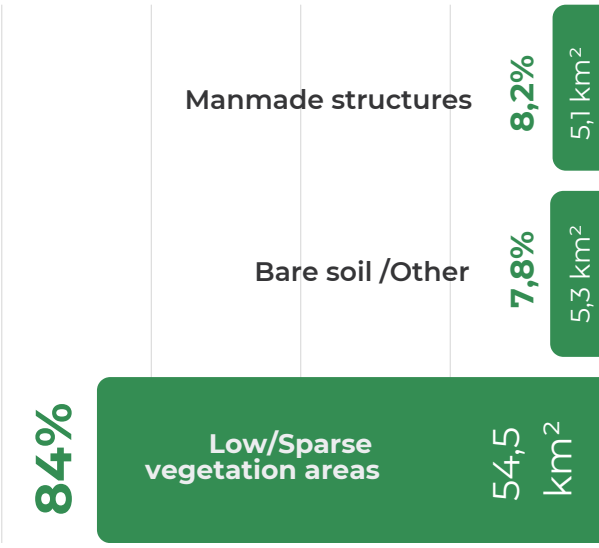
Site suitability assessment



Suitable locations for solar farm sites in Southern France, with respect to the topography of the area avoiding agricultural and forest regions as derived from the very high resolution DTM, NEXTMap One (basemap: Bing Maps).





Solar Farm Site Assessments provide a comprehensive evaluation of potential sites for the establishment of a solar farm. The objective of such analysis is to assist stakeholders in making well-informed decisions by highlighting the most suitable location that optimizes solar energy potential, ensures environmental compatibility, and offers attractive economic benefits.

Please note that the extracted areas have been generated using NEXTMap One and the Copernicus CORINE Land Cover dataset. It is important to note that the exact slope requirements may vary depending on specific regional and environmental conditions. Special thanks go to Intermap for the provision of the NEXTMap One elevation data of the site assessment analysis.

To receive more information please contact us at: info@cloudeo.group

Visit NEXTMap One product page for more information

Need to extract meaningful geospatial insights?

Contact us:

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