Smart Altitude WebGIS – Geodata Sources

Hierarchy of Geodata Smart Altitude WebGIS - Sources

1. Ski Resort Key Performance Indicators (KPIs) of Case Study Areas: measureable values that demonstrates how effectively the ski resort is achieving key business objectives – Smart Altitude Project Results

Smart Altitude Project results: Ski resort KPIs
SKI RESORT KPIs are measurable values that demonstrates how effectively the ski resort is achieving key business objectives.
E_EF: Energy Efficiency; Unit: 1-5 Weighted average of scores from Energy Efficiency KPIs (Benchmarking Methodology)
E_EC: Energy Economy; Unit: 1-5 Weighted average of scores from Energy Efficiency KPIs (Benchmarking Methodology)
S: Sustainability; Unit: 1-5 Weighted average of scores from Sustainability KPIs (Benchmarking Methodology)
EM: Energy Management; Unit: 1-5 Weighted average of scores from the Energy Management section
SG: Smart Grid; Unit: 1-5 Weighted average of scores from the Smart Grid section
ACC: Adaptation to Climate Change; Unit: 1-5 Weighted average of scores from the Adaptation to Climate Change section
SE: Self Evaluation; Unit: 1-5 Weighted average of scores from the Self Evaluation section
FO: Future Outlook; Unit: 1-5 Weighted average of scores from the Future Outlook section
OV: Overall Ski-Resort KPI it is designed as average of scores from the 8 previous KPIs*; Unit: 1-5* Weighted average of scores from Energy Efficiency, Energy Economy, Sustainability, Energy Management, Smart Grid, Adaptation to Climate Change, Self-Evaluation, Future Outlook sections (partially applying a Benchmarking Methodology)
For details see project sheets ski resorts evaluation reports

   1.1. Overall Ski-Resort KPI (OV)
   1.2. Energy Efficiency (E_EF)
   1.3. Energy Economy (E_EC)
   1.4. Sustainability (S)
   1.5. Energy Management (EM)
   1.6. Smart Grid (SG)
   1.7. Adaptation to Climate Change (ACC)
   1.8. Self Evaluation (SE)
   1.9. Future Outlook (FO)
2. Snow & Ski
   2.1. Open Ski Map (OSM)

Pistes and ski resorts out of the OpenSnowMap
http://www.opensnowmap.org/iframes/data.html#osm
On this page you can find ski extracts from the openstreetmap database in various formats.
Format: osm (planet_pistes.osm.gz)
Download link: http://www.opensnowmap.org/iframes/data.html#osm
Download date: 09.08.2019
Data Source: OpenSnowMap, OpenStreetMap
rights to publish: Data are available under the term of the ODBL License, attribution must be granted to (c)www.openstreetmap.org & contributors wherever the data is used. You are welcome to provide this data 'Courtesy of www.opensnowmap.org'.

      2.1.1.Ski Resorts

2.1.2.Pistes

3. Renewable Energy Potential
   3.1. Solar
      3.1.1. Global Solar Atlas (GSA Version 2.0)

Global solar resource data can be obtained from the **Global Solar Atlas** (GSA version 2.0 of October 2019). This is a free, web-based application that is developed and operated by the company "Solargis" s.r.o. on behalf of the "World Bank Group" (https://globalsolaratlas.info/support/terms-of-use, access: 11.11.2019). Their work is funded by the Energy Sector Management Assistance Program (ESMAP) and part of a global ESMAP initiative on Renewable Energy Resource Mapping that includes biomass, small hydro, solar and wind (https://globalsolaratlas.info/support/about, access: 11.11.2019). It is licensed under the Creative Commons Attribution 4.0 International License.
The Global Solar Atlas offers the longterm yearly/monthly average of daily totals of several datasets for solar resource and the photovoltaic power potential (PV) [kWh/kWp]. This PV Electricity output "indicates the kWh of electricity that would be generated by a PV system with 1kW peak installed capacity (https://globalsolaratlas.info/about/faq, access: 11.10.2019). Other world wide data layers are the Global horizontal irradiation [kWh/m2], Diffuse horizontal irradiation [kWh/m2], Global irradiation for optimally tilted surface [kWh/m2], Optimum tilt to maximize yearly yield [°], that is the optimum inclination [º] of an inclined and fixed PV modules for a specific azimuth (orientation), for which the PV modules receive the highest amount of solar radiation per year, Direct normal irradiation [kWh/m2] as well as the Air Temperature at 2 m above ground level [°C] and the Terrain elevation above sea level [m a.s.l.] (https://globalsolaratlas.info/about/data-description, access: 11.09.2019; https://globalsolaratlas.info/downloads/world, access: 11.10.2019). All data layers are provided as GeoTiff format. The spatial resolution is approximatively 1km. Temporal coverage is 1994 to 2018 (https://globalsolaratlas.info/support/release-notes; access: 03.12.2019 & https://globalsolaratlas.info, access: 11.09.2019).
For methodology see https://globalsolaratlas.info/support/methodology
Data accurancy: https://globalsolaratlas.info/support/accuracy
For additional information see *https://globalsolaratlas.info*

On the website there is a clear statement on the limitation of Global Solar Atlas:
"The objective of the Global Solar Atlas is to provide reliable introductory-level data to help policymakers, researchers, and commercial solar companies take better decisions. For project-specific analysis of large power plants, the data available via the Global Solar Atlas is suitable only for preliminary analysis. The PV yield estimates do not account for many important factors that can impact potential yield of a photovoltaic power plant. For large power plants, it is recommended to work with more detailed yield estimation tools in order to obtain a precise estimate of energy yield (https://globalsolaratlas.info/support/getting-started; access: 11.11.2019)".

This Atlas provides long-term yearly averaged solar resource and PV power potential values, described withunder as yearly summaries, except of the air temperature, that is represented as a long-term yearly average.
GHI (Global Horizontal Irradiation): Sum of direct and diffuse components of solar radiation [kWh/m2]. It is considered as a climate reference as it enables comparing individual sites or regions.
DNI (Direct Normal Irradiation): Solar radiation component that directly reaches the surface [kWh/m2]. It is relevant for concentrating solar thermal power plants (CSP) and photovoltaic concentrating technologies (CPV).
DIF (Diffuse Horizontal Irradiation): Solar radiation component that is scattered by the atmosphere [kWh/m2].
GTI (Global Tilted Irradiation): Sum of direct and diffuse solar radiation falling on a tilted surface of fixed-mounted PV modules [kWh/m2]. Compared to the horizontal surface, the tilted surface also receives a small amount of ground-reflected solar radiation.

PVOUT (PV Electricity output): Amount of energy, converted by a PV system into electricity [kWh/kWp] that is expected to be generated according to the geographical conditions of a site and a configuration of the PV system. Three configurations of a PV system are considered: (i) Small residential; (ii) Medium-size commercial; and (iii) Ground-mounted large scale.
OPTA (Optimum angle): Optimum inclination [º] of an inclined and fixed PV modules for a specific azimuth (orientation), for which the PV modules receive the highest amount of solar radiation per year. As default azimuth values towards the Equator are considered, i.e. South (180º) for Northern hemisphere and North (0º) for the Southern hemisphere.
TEMP (Air Temperature at 2 meters above ground): Air temperature [ºC or ºF] determines the temperature of PV cells and modules and has a direct impact on PV energy conversion efficiency and resulting energy losses. Air temperature and also some other meteorological parameters are an important part of each solar energy project assessment as they determine the operating conditions and operation efficiency of the solar power plant.
ELE (Elevation): Represents terrain elevation (altitude) relative to the sea level [m or ft]. Only data for the land area is shown. Areas of more complex orographic conditions (terrain) are generally less populated and most often not suitable for large-scale solar energy development.

Units of the provided data layers, that include longterm yearly average of daily sum (LTAy_DailySum):

- PVOUT – Photovoltaic power potential [kWh/kWp]
- GHI – Global horizontal irradiation [kWh/m2]
- DIF – Diffuse horizontal irradiation [kWh/m2]
- GTI – Global irradiation for optimally tilted surface [kWh/m2]
- OPTA – Optimum tilt to maximize yearly yield [°]
- DNI – Direct normal irradiation [kWh/m2]

Beside the solar resource data, other auxiliary data layers are provided:

- TEMP - Air Temperature at 2 m above ground level [°C]
- ELE - Terrain elevation above sea level [m a.s.l.]

Data parameter	**Acronym**	**Unit**	**Temporal aggregation**	**Spatial resolution**	**Source(s)**
PV Electricity Output	PVOUT	kWh/kWp or kWh	12 x 24 (month x hour) profiles	1 km x 1 km	Solargis
Global Horizontal Irradiation	GHI	kWh/m2	Annual average	1 km x 1 km	Solargis
Diffuse Horizontal Irradiation	DIF	kWh/m2	Annual average	1 km x 1 km	Solargis
Direct Normal Irradiation	DNI	kWh/m2	12 x 24 (month x hour) profiles	1 km x 1 km	Solargis
Optimum inclination [º] for inclined and fixed equator facing PV modules	OPTA	°	Annual average	1 km x 1 km	Solargis
Air Temperature at height of 2m	TEMP	°C	Annual average	1 km x 1 km	ERA5, post-processed by Solargis

Elevation	ELE	m	-	90m	SRTM-3 and other multiple sources, post-processed by Solargis

https://globalsolaratlas.info/support/data-outputs; access: 03.12.2019

3.1.1.1. PVOUT – Photovoltaic power potential [kWh/kWp]
3.1.1.2. GHI – Global horizontal irradiation [kWh/m2]
3.1.1.3. DIF – Diffuse horizontal irradiation [kWh/m2]
3.1.1.4. GTI – Global irradiation for optimally tilted surface [kWh/m2]
3.1.1.5. OPTA – Optimum tilt to maximize yearly yield [°]
3.1.1.6. DNI – Direct normal irradiation [kWh/m2]
3.1.1.7. TEMP - Air Temperature at 2 m above ground level [°C]
3.1.1.8. ELE - Terrain elevation above sea level [m a.s.l.]

3.1.2.Hotmaps Project

Hotmaps Project data
In the EU project hotmaps (https://www.hotmaps-project.eu/), they collected and re-elaborated data on energy potential of renewable sources at national level, in order to build datasets for all EU28 countries at NUTS3 level. They considered the following renewable sources: biomass, waste and wastewater, shallow geothermal, wind, and solar energy. These data are used in the toolbox to map the sources of renewable thermal energy across the EU28 and support energy planning and policy. Four datasources are provided on GitLab – they are used for the Smart Altitude WebGIS. Please consider, that all hotmaps-data must be interpretated as indicators, rather than absolute figures representing the actual energy potential of renewable sources in a territory.

3.1.2.1. Solar Energy Potential [kWh/m2]

Solar Energy Potential of Hotmaps Project
„Data on annual global radiation on globally inclined surfaces in kWh/m2 were retrieved from the PVGIS as a 1km x 1km raster layer and clipped by considering the building footprint with a resolution of 100m x 100m from Copernicus Services. The data were used as indicator to define patterns in Chiara Scaramuzzino, Giulia Garegnani, Pietro Zambelli, Integrated approach for the identification of spatial patterns related to renewable energy potential in European territories, Renewable and Sustainable Energy Reviews, Volume 101, 2019, Pages 1-13, ISSN 1364-0321, https://doi.org/10.1016/j.rser.2018.10.024.“
Unit: kWh/m2
Data format: Raster, GTiff
Download link: https://gitlab.com/hotmaps/potential/potential_solar
Last upload: June 2019
Download date: 10.08.2019
Spatial resolution: 100*100m, EU28
Temporal resolution: yearly
How to cite
@article{SCARAMUZZINO20191, title = "Integrated approach for the identification of spatial patterns related to renewable energy potential in European territories", journal = "Renewable and Sustainable Energy Reviews", volume = "101", pages = "1 - 13", year = "2019", issn = "1364-0321", doi = "https://doi.org/10.1016/j.rser.2018.10.024", url = "http://www.sciencedirect.com/science/article/pii/S1364032118307275", author = "Chiara Scaramuzzino and Giulia Garegnani and Pietro Zambelli", keywords = "Renewable energy sources,

Energy planning, Energy policy, EU28", abstract = "The study presents an effort to classify the territories of a specific area, according to similarities in the estimated potential of their renewable sources, considering also their economic and sociodemographic structure and their geographic features. Specifically, the paper focuses on the area of EU28 and Switzerland and uses as basis for the analysis, data estimating the potential of renewable energy sources collected and elaborated in the framework of the project HotMaps (Horizon 2020). The method used to group the territorial units is cluster analysis, and specifically the k-means algorithm. The data present some interesting patterns and the territories of EU28 and Switzerland at NUTS3 level are classified into 17 clusters. The analysis shows the presence of heterogeneity within national borders and among territories comprised in the macro regions target of specific EU programmes, specifically the Adriatic-Ionian region, the Alpine region, the Baltic Sea region and the Danube region. The results of this research are meant to be used by European policy makers in developing more focused transnational renewable energy policies and strategies."}

Authors
Chiara Scaramuzzino, Pietro Zambelli, Giulia Garegnani*
* Eurac Research
Institute for Renewable Energy VoltaStraße/Via Via A. Volta 13/A 39100 Bozen/Bolzano

License
Copyright © 2016-2018: Giulia Garegnani giulia.garegnani@eurac.edu, Pietro Zambelli pietro.zambelli@eurac.edu
Creative Commons Attribution 4.0 International License This work is licensed under a Creative Commons CC BY 4.0 International License.
SPDX-License-Identifier: CC-BY-4.0 License-Text: https://spdx.org/licenses/CC-BY-4.0.html

3.2. Wind

3.2.1. Global Wind Atlas (GWA Version 3.0)

On the same platform as the GSA even the **Global Wind Atlas** (GWA version 3.0 of October 2019) is made available. “The Global Wind Atlas is a free, web-based application developed to help policymakers, planners, and investors identify high-wind areas for wind power generation virtually anywhere in the world, and then perform preliminary calculations (https://globalwindatlas.info/about/introduction; access: 27.11.2019). It is the product of the Department of Wind Energy at the Technical University of Denmark and the World Bank Group, funded by ESMAP (https://globalwindatlas.info/about/introduction; access: 25.11.2019). It is licensed under the Creative Commons Attribution 4.0 International License.

GeoTiffs are available separately for each country in the Alpine Space. We used and downloaded the datasets of 12 countries (8 Alpine Space Countries (no single Monaco dataset) and 4 surrounding ones) to avoid border effects resulting from a different country border precisicion (download link: https://globalwindatlas.info/downloads/gis-files; access: 11.11.2019). These are the three Wind Energy Layers Capacity Factor IEC Class |, Capacity Factor IEC Class || and Capacity Factor IEC Class ||| as well as the mean wind power density, mean wind speed and mean air density layers each for the three selected heigths. The info button on the startpage of the Global Wind Atlas states the following: “*Mean Wind Power Density* is a measure of the wind resource. Higher values indicate better wind resources.”

“*Mean Wind Speed* is a measure of the wind resource. Higher values normally indicate better wind resources, but mean wind power density gives a more accurate indication of the available wind resource.”

The spatial resolution is again 1km (https://globalwindatlas.info/about/method, access: 09.10.2019). The simulation period is 2008-2017 (Source: mail with Solargis Team GWA: Niels). The unit of the wind power density is W/m² (https://globalwindatlas.info/, access: 09.10.2019). As mentioned above, these values can mainly be used for comparative analysis. A high value indicates a high potential for renewable energy from wind (https://globalwindatlas.info/, information button on the left upper side, access: 09.10.2019). We have taken the values at a hight of 10m, 50m and 100m for the WebGIS

because that should be the most important heights in regard to the height of energy producing machines like wind turbines, but they are also available for 150m and 200m height (https://globalwindatlas.info/about/method, access: 09.10.2019; https://globalwindatlas.info/downloads/gis-files; access: 03.12.2019).
For further information see https://globalwindatlas.info

- 3.2.1.1. Wind Energy Layers
  - 3.2.1.1.1. Capacity Factor IEC Class 1
  - 3.2.1.1.2. Capacity Factor IEC Class 2
  - 3.2.1.1.3. Capacity Factor IEC Class 3
- 3.2.1.2. Wind-Speed in a height of
  - 3.2.1.2.1. 10m [m/s]
  - 3.2.1.2.2. 50m [m/s]
  - 3.2.1.2.3. 100m [m/s]
- 3.2.1.3. Power-Density in a height of
  - 3.2.1.3.1. 10m [W/m2]
  - 3.2.1.3.2. 50m [W/m2]
  - 3.2.1.3.3. 100m [W/m2]
- 3.2.1.4. Air-Density in a height of
  - 3.2.1.4.1. 10m [kg/m3]
  - 3.2.1.4.2. 50m [kg/m3]
  - 3.2.1.4.3. 100m [kg/m3]

3.2.2. Hotmaps Project
- 3.2.2.1. Power Density Potential in 50m height [W/m²]

Wind energy potential
„Data show the total energy potential of wind in the EU28 at NUTS3 level. The original dataset is the Wind Global Atlas from IRENA and developed by the DTU (Delf, the Netherlands). Raster data with the power density of wind at 50, 100 and 200 m have been aggregated at NUTS3 level in Grass GIS, through the Corine Land Cover and by excluding urban areas, bird connectivity corridors, mountain peaks over 2500m and protected areas from the Natura 2000 framework.
Data on the wind-energy potential in W/m2 have been drawn by the Global Wind Atlas (DTU Department of Wind Energy) for 50, 100, 200 m hub heights.“
Unit: W/m2
Spatial resolution: 300*300m
Temporal resolution: yearly
Data format: Raster, GTiff
Download link: https://gitlab.com/hotmaps/potential/potential_wind
Download date: 10.08.2019
Last upload: July 2019
For further information, methodology see https://gitlab.com/hotmaps/potential/potential_wind
How to cite
Simon Pezzutto, Stefano Zambotti, Silvia Croce, Pietro Zambelli, Giulia Garegnani, Chiara Scaramuzzino, Ramón Pascual Pascuas, Alyona Zubaryeva, Franziska Haas, Dagmar Exner (EURAC), Andreas Müller (e-think), Michael Hartner (TUW), Tobias Fleiter, Anna-Lena Klingler, Matthias Kühnbach, Pia Manz, Simon Marwitz, Matthias Rehfeldt, Jan Steinbach, Eftim Popovski (Fraunhofer ISI) Reviewed by Lukas Kranzl, Sara Fritz (TUW) Hotmaps Project, D2.3 WP2 Report – Open Data Set for the EU28, 2018 www.hotmaps-project.eu
Authors
Giulia Garegnani, Chiara Scaramuzzino
* Eurac Research
Institute for Renewable Energy VoltaStraße/Via Via A. Volta 13/A 39100 Bozen/Bolzano
License

Copyright © 2016-2018: Giulia Garegnani giulia.garegnani@eurac.edu, Pietro Zambelli pietro.zambelli@eurac.edu
Creative Commons Attribution 4.0 International License This work is licensed under a Creative Commons CC BY 4.0 International License.
SPDX-License-Identifier: CC-BY-4.0 License-Text: https://spdx.org/licenses/CC-BY-4.0.html

3.2.3. Geothermal

3.2.3.1. Thermomap Project / Hotmaps Project

3.2.3.1.1. Thermomap [W/m K]

Data on very shallow **geothermal energy potential** in W/m K were retrieved from the EC co-funded project ThermoMap as a vector layer and presented in the hotmaps project without further elaboration.
Data format: ESRI Shapefile
Download link: https://gitlab.com/hotmaps/potential/potential_shallowgeothermal
Download date: 10.08.2019
Unit: W/m K
Data provider: Thermomap project http://www.eurogeosurveys.org/projects/thermomap/

3.3. Biomass

3.3.1. Hotmaps Project

Biomass energy potential
Download link: https://gitlab.com/hotmaps/potential/potential_biomass
Last upload: 2018
Data developed within the EU project „hotmaps“
Data format: csv tables
Unit: PJ
Data provided at GitLab: Three datasets-tables with NUTS3 ID column are available. They cover the following biomass sources:
Agricultural residues – energy potential from agricultural residues
„Original data at NUTS0 level from the Intelligent Energy Europe [1] for energy potentials in PJ of straws, prunings and residues from agro-industrial processes (olive pits) have been spatialized on the base of Lucas dataset.[2]“
Considered agricultural residues are crop, cereals, maize, oilseed rape and sunflower, sugar beet, rice, olives, citrus and grape.
Livestock effluents – energy potential from livestock effluents
„Original data from the Intelligent Energy Europe [1] on production of solid and liquid residues from breeding of the following livestock: pig, cattle and poultry.
The whole energy potential in PJ has been spatialized on the base of the EURASTAT dataset Holdings with manure storage facilities.“
Considered livestock effluents for the energy generation are solid and liquid manure from breeding of cattle, pigs and poultry.
Forestry residues – energy potential from forestry residues
„Original data at country level from the Intelligent Energy Europe [1].
Results in terms of PJ of energy potential have been spatialized by using the Corine Land Cover.“
Forest biomass includes two categories of residues originated from forest management, and in particular from wood harvest and processing residues (from industrial production and non): Fuelwood and roundwood; Fuelwood and roundwood residues.
Spatial resolution: NUTS 3
Temporal resolution: yearly, current: 2014
For further information, methodology and limitations of data see https://gitlab.com/hotmaps/potential/potential_biomass

References

[1] Outlook of Spatial Biomass Value Chains in EU28, Deliverable 2.3 of the Biomass Policies project, Intelligent Energy Europe, September 204
[2] Land Use and Cover Area frame Survey, Eurostat, 2015

How to cite

Simon Pezzutto, Stefano Zambotti, Silvia Croce, Pietro Zambelli, Giulia Garegnani, Chiara Scaramuzzino, Ramón Pascual Pascuas, Alyona Zubaryeva, Franziska Haas, Dagmar Exner (EURAC), Andreas Müller (e-think), Michael Hartner (TUW), Tobias Fleiter, Anna-Lena Klingler, Matthias Kühnbach, Pia Manz, Simon Marwitz, Matthias Rehfeldt, Jan Steinbach, Eftim Popovski (Fraunhofer ISI) Reviewed by Lukas Kranzl, Sara Fritz (TUW) Hotmaps Project, D2.3 WP2 Report – Open Data Set for the EU28, 2018 www.hotmaps-project.eu

Authors

Chiara Scaramuzzino Giulia Garegnani,
* Eurac Research Institute for Renewable Energy VoltaStraße/Via Via A. Volta 13/A 39100 Bozen/Bolzano

License

Copyright © 2016-2018: Giulia Garegnani giulia.garegnani@eurac.edu, Pietro Zambelli pietro.zambelli@eurac.edu
Creative Commons Attribution 4.0 International License This work is licensed under a Creative Commons CC BY 4.0 International License.
SPDX-License-Identifier: CC-BY-4.0 License-Text: https://spdx.org/licenses/CC-BY-4.0.html

To have some data concerning biomass potential, we found the **Aboveground live woody biomass density** values in megagrams biomass per hectare [Mg ha-1] from the open data portal **Global Forest Watch**, owned and operated by the World Resources Institute. These "carbon density values can be estimated as 50 percent of biomass density values" (Source: http://data.globalforestwatch.org/datasets/aboveground-live-woody-biomass-density, access: 09.10.2019). The spatial resolution of the GeoTiffs is 30m, representing the year 2000 (http://data.globalforestwatch.org/datasets/aboveground-live-woody-biomass-density, access: 09.10.2019). For further information, methodology, uncertainties and download see
http://data.globalforestwatch.org/datasets/aboveground-live-woody-biomass-density
http://data.globalforestwatch.org/datasets/8f93a6f94a414f9588ce4657a39c59ff_1/data?geometry=-43.396%2C42.25%2C40.232%2C52.607
It is licensed under the Creative Commons Attribution 4.0 International License.

Same geo- & metadata like in the AlpES project
http://www.wikialps.eu/doku.php?id=wiki:grassland_biomass
http://www.wikialps.eu/lib/exe/fetch.php?media=de:wiki:de_biomass_production_from_grassland-supply.pdf

The **Global Power Plant Database** (Version 1.2.0 of June 2019; Source 1) covers approximately 30000 power plants around the world. Beside the thermal plants it includes also renewables. Because they

are geolocated and the entries in the csv table contain additional information on plant capacity, we decided to select this dataset and added it to the Smart Altitude WebGIS (Info and Download link: http://datasets.wri.org/dataset/globalpowerplantdatabase, access: 09.10.2019 – Source to mention: Global Energy Observatory, Google, KTH Royal Institute of Technology in Stockholm, Enipedia, World Resources Institute. 2018. Global Power Plant Database. Published on Resource Watch and Google Earth Engine; http://resourcewatch.org/ https://earthengine.google.com/). It is licensed under the Creative Commons Attribution 4.0 International License.

4. Protected Areas
   4.1. World Database on Protected Areas

World Database on Protected Areas (WDPA)
„Protected Planet is the most up to date and complete source of information on protected areas, updated monthly with submissions from governments, non-governmental organizations, landowners and communities. It is managed by the United Nations Environment World Conservation Monitoring Centre (UNEP-WCMC) with support from IUCN and its World Commission on Protected Areas (WCPA).“ https://www.protectedplanet.net/c/about
Release: August 2019
Download link: https://www.protectedplanet.net/
Download date: 12.08.2019
Further information: https://www.protectedplanet.net/
Citation:
UNEP-WCMC and IUCN (year), Protected Planet: [insert name of component database; The World Database on Protected Areas (WDPA)/The Global Database on Protected Areas Management Effectiveness (GD-PAME)] [On-line], [insert month/year of the version downloaded], Cambridge, UK: UNEP-WCMC and IUCN. Available at: www.protectedplanet.net**.**
No Sub-licensing or Redistribution of WDPA Data
The WDPA Materials may not be sub-licensed in whole or in part including within Derivative Works without the prior written permission of UNEP-WCMC. You may not redistribute the WDPA Data contained in the WDPA in whole or in part by any means including (but not limited to) electronic formats such as web downloads, through web services, through interactive web maps (including mobile applications) that grant users download access, KML Files or through file transfer protocols. If you know of others who wish to use the WDPA Data please refer them to protectedplanet.net. If you wish to provide a service through which the WDPA Data are downloadable or otherwise made available for redistribution you must contact protectedareas@unep-wcmc.org for permission and further guidance.
Publishing the WDPA
You may publish the WDPA Materials in whole or in part, including on-line, providing (a) the WDPA Data are not downloadable and (b) the proper attribution is clearly visible (see 'Attribution' below). You must ensure that the most recently available version of the WDPA Materials is being used and that the month and year of release is visible in the published version. WDPA Materials published online, including through mobile applications, must provide a clear link to the original on-line source of the WDPA at Protected Planet (www.protectedplanet.net). We strongly recommend that you have the relevant materials reviewed by UNEP-WCMC prior to publication. We require two free copies of all published materials to be provided to UNEP-WCMC. Hard copies should be sent to Protected Areas Programme, UNEP-WCMC, 219 Huntingdon Road, Cambridge CB3 0DL, UK. Electronic copies should be sent to protectedareas@unep-wcmc.org.

➔ mainly polygons used, points only in/for slovenia

      4.1.1. WDPA areas
      4.1.2. WDPA points (Addition only for Slovenia)
   4.2. Natura 2000

Natura 2000
Short information: Natura 2000 data - the European network of protected sites
"Natura 2000 is the key instrument to protect biodiversity in the European Union. It is an ecological network of protected areas, set up to ensure the survival of Europe's most valuable species and habitats. Natura 2000 is based on the 1979 Birds Directive and the 1992 Habitats Directive. This version covers the reporting in 2018." https://www.eea.europa.eu/data-and-maps/data/natura-10#tab-additional-information
Metadata: https://www.eea.europa.eu/data-and-maps/data/natura-10#tab-metadata
Further information: http://ec.europa.eu/environment/nature/natura2000/sites/index_en.htm#SDF
Temporal coverage: 2018
Scale of the dataset: 1:100000
Format: Shapefile
Published: April 2019
Download link: https://www.eea.europa.eu/data-and-maps/data/natura-10#tab-gis-data
Download date: 08.08.2019
Data sources: Unit Nature & Biodiversity, DG Environment, European Commission, Member States of the European Union
Data provider: European Environment Agency (EEA)
Data owners: Directorate-General for Environment (DG ENV)
Data processors: European Environment Agency (EEA)
Right to publish in AlpES WebGIS: "EEA standard re-use policy: unless otherwise indicated, re-use of content on the EEA website for commercial or non-commercial purposes is permitted free of charge, provided that the source is acknowledged (http://www.eea.europa.eu/legal/copyright). Copyright holder: Directorate-General for Environment (DG ENV)"

4.3. Nationally Designated Areas (CDDA)

Nationally designated areas (CDDA)
Version 17
Short information:
"The dataset contains data on individual nationally Designated Areas and corresponding Protected Site spatial features in EEA member and collaborating countries."
https://www.eea.europa.eu/data-and-maps/data/nationally-designated-areas-national-cdda-14
"The European inventory of nationally designated areas holds information about protected areas and the national legislative instruments, which directly or indirectly create protected areas."
"The Common Database on Designated Areas (CDDA) is more commonly known as Nationally designated areas. It is the official source of protected area information from the 39 European countries to the World Database of Protected Areas (WDPA)."
https://www.eea.europa.eu/data-and-maps/data/nationally-designated-areas-national-cdda-14#tab-metadata
Metadata: https://www.eea.europa.eu/data-and-maps/data/nationally-designated-areas-national-cdda-14#tab-metadata
Further information: https://www.eea.europa.eu/data-and-maps/data/nationally-designated-areas-national-cdda-14#tab-additional-information
Temporal coverage: it covers data reported until March 2019
Format: **ArcGIS geodatabase file**
Published: June 2019
Download link: https://www.eea.europa.eu/data-and-maps/data/nationally-designated-areas-national-cdda-14
Download date: 08.08.2019

Data sources: Data deliveries from the Eionet, the partnership network of the EEA and its 39 member and cooperating countries. In EU Member States the implementation of INSPIRE Directive may mean that the spatial information is provided via the national or sub-national INSPIRE data providers.
Data owners and providers: European Environment Agency (EEA)
Right to publish in AlpES WebGIS: EEA standard re-use policy: unless otherwise indicated, re-use of content on the EEA website for commercial or non-commercial purposes is permitted free of charge, provided that the source is acknowledged (http://www.eea.europa.eu/legal/copyright). Copyright holder: European Environment Agency (EEA); Estonian Environmental Register 01.01.2019; ©Finnish Environment Institute, 2018; Land Burgenland, Land Kärnten, Land Niederösterreich, Land Oberösterreich, Land Salzburg, Land Steiermark, Land Tirol, Land Vorarlberg, Stadt Wien aggregated by Austrian Environment Agency.

- 4.4. Protected Areas - IGF curated
  - 4.4.1. Biosphere Reserves
  - 4.4.2. National Parks
  - 4.4.3. Natural Parks
  - 4.4.4. World Heritage Sites
5. Land cover
   - 5.1. Corine Land Cover (CLC)

Corine Land Cover (CLC) 2018

Version 20
Publication date: June 2019
Short information: Land use/cover
Temporal and spatial coverage: 2018, all EEA39 countries
Resolution: 100m
Geographic accuracy: 25 ha minimum mapping unit, 100m minimum mapping width, 100m positional accuracy, >85% thematic accuracy
Metadata:
“CORINE Land Cover (CLC) was specified to standardize data collection on land in Europe to support environmental policy development.” https://land.copernicus.eu/pan-european/corine-land-cover/clc-2012?tab=metadata
Format: Raster (GTiff)
Download link: https://www.eea.europa.eu/data-and-maps/data/corine-land-cover-accounting-layers
Download date: 08.08.2019
Data custodians and owners: European Environment Agency (EEA)
Data sources: CLC products are based on (visual or semi-automated) interpretation of high-resolution multispectral satellite imagery like IRS, SPOT and RapidEye satellite images, dual coverage, orthophotos, topographic maps
Right to publish in AlpES WebGIS: https://creativecommons.org/licenses/by/3.0/at/deed.de
"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."
„EEA standard re-use policy: unless otherwise indicated, re-use of content on the EEA website for commercial or non-commercial purposes is permitted free of charge, provided that the source is acknowledged (http://www.eea.europa.eu/legal/copyright). Copyright holder: European Environment Agency (EEA).“
https://sdi.eea.europa.eu/catalogue/srv/eng/catalog.search#/metadata/5a5f43ca-1447-4ed0-b0a6-4bd2e17e4f4d

- 5.2. European Forest Areas

European Forest Areas based on Copernicus data
Units: 1: forest, 0: non-forest
Download link: https://www.eea.europa.eu/data-and-maps/data/european-forest-areas-based-on
Published: July 2019
Download date: 11.08.2019
Data format: GTiff, Raster
Spatial resolution: 100m, EEA39
Temporal resolution: 2015
„These data sets show the European forest area in 2012 and in 2015 at 100m spatial resolution, covering EEA39 countries. They are based on Copernicus HRL forest products at 20m spatial resolution and comply with the FAO forest definition (i.e. minimum mapping unit of 0.5 ha, minimum coverage of 10% and excluding land that is predominantly under agricultural or urban land use). After the selection of those pixels identified as forest by the HRL forest products and also compliant with FAO criteria, the forest area dataset at 100m was computed as a Boolean product (i.e. forest / non-forest). The value 1 (forest area) correspond to the pixels where forest is the major coverage; otherwise the pixel value is 0 (non-forest area)." https://www.eea.europa.eu/data-and-maps/data/european-forest-areas-based-on

6. Alpine Space - Project Related Areas

All datasets IGF curated – generation with help of EBM data

   6.1. Alpine Space Area
   6.2. Alpine Convention Area
   6.3. Smart Altitude - Case Study Areas (Ski Resort LAU Communities)
7. Administrative & Statistical Units (EuroBoundaryMap)

Admin Unit 1-4, NUTS 1-3 & LAU out of EuroBoundaryMap (EBM) 2019
The EBM 2019 is the European reference database of administrative units and boundaries for an application scale of 1:100000.
„EuroBoundaryMap provides a European geographic database for administrative and statistical regions that will be maintained at the source level by the National Mapping and Cadastral Agencies (NMCAs), and by providing harmonized access conditions for this geographic information within the framework of EuroGeographics. EBM offers the combined strength of detailed European administrative units and linkages to the corresponding LAU and NUTS codes."
The dataset is compiled from data supplied by European National Mapping and Cadastral Agencies within in framework of EuroGeographics. It is harmonised by means of a uniform specification developed and continuously improved accourding to user needs by Bundesamt für Kartographie und Geodäsie (BKG).
The present EuroBoundaryMap product contains the administrative units of all national administrative levels, their names and unique codes of 43 Euopean states according to the administrative situation as it was on 1 January 2018. The database is including relations between the European-wide unique identifiers of administrative units on the lowest level and their corresponding statistical codes (LAU) as defined by the National Statistical Institutes and also to the corresponding codes of the territorial units for statistics (NUTS) maintained and published by Eurostat.
for further information see
https://eurogeographics.org/products-and-services/
Coverage: Full Europe, EU28, all EFTA and some of current candidate countries as well as placeholders for all missing countries
Data/DVD provided from German „Bundesamt für Kartographie und Geodäsie – EuroGeographics"
DVD delivery: Mai 2019
DVD with data, documents and metadata available from EuroGeographics Head Office

Rue du Nord 76/Noordstraat 76 Brussels 1000
Contact: contact@eurogeographics.org, mick.cory@eurogeographics.org
www.eurogeographics.org
Format: ESRI FileGDB
Restrictions on the access and use of a resource or metadata: https://eurogeographics.org/products-and-services/licensing/
Right to publish in AlpES WebGIS: Academic, Education and Research Licence Agreement between EuroGeographics AISBL and ÖAW/IGF valid until 07/2020

7.1. Admin Unit/Boundary Level 1
7.2. Admin Unit/Boundary Level 2
7.3. Admin Unit/Boundary Level 3
7.4. Admin Unit/Boundary Level 4
7.5. NUTS 1 - Major socio-economic regions
7.6. NUTS 2 - Basic regions for the application of regional policies
7.7. NUTS 3 - Small regions for specific diagnoses
7.8. LAU - Local Administrative Units
7.9. LAU - Labels

8. Digital Elevation Model & Hillshade

Digital Elevation Model over Europe (EU-DEM)
"The Digital Elevation Model over Europe from the GMES RDA project (EU-DEM) is a Digital Surface Model (DSM) representing the first surface as illuminated by the sensors. The EU-DEM dataset is a realisation of the Copernicus programme, managed by the European Commission, DG Enterprise and Industry. […]The EU-DEM is a 3D raster dataset with elevations captured at 1 arc second postings (2.78E-4 degrees) or about every 30 metre." http://www.eea.europa.eu/data-and-maps/data/eu-dem
https://eurogeographics.org/products-and-services/
„EuroDEM is a 1:100 000 scale digital elevation model providing height data for 40 European countries and territories."
https://eurogeographics.org/products-and-services/eurodem/
EuroDEM (digital elevation model) describes the distribution of terrain or 'bare earth' heights, not including 'first surface' elevations such as vegetation and man-made structures. It is ideal for environmental change research, hydrologic modelling, resource monitoring, monitoring mapping and visualisation.
Metadata: http://www.eea.europa.eu/data-and-maps/data/eu-dem#tab-metadata
Format: Gtif
Temporal coverage: 2000
Spatial resolution: 25m
Spatial accurancy: 8-10m vertical accurancy, 2 arc seconds grid width
Download link: http://www.eea.europa.eu/data-and-maps/data/eu-dem
Download date: 04.08.2016
Last upload: 8.10.2013
Data provider and processor: European Environment Agency (EEA) 2013,
Data owners: European Commission and Directorate-General Enterprise and Industry (DG-ENTR)
Data sources: The EU-DEM is a hybrid product based on SRTM and ASTER GDEM data fused by a weighted averaging approach
Right to publish in AlpES WebGIS: The following credit must be displayed when using these data: "Produced using Copernicus data and information funded by the European Union - EU-DEM layers."

DEM Resamplings (250m, 1000m) and Hillshades are derivates from EU-DEM

8.1. Digital Elevation Model (DEM) [m]

8.2. Hillshade (°)
8.3. Combined DEM & Hillshade

Literature

McCarthy, James & Jim Thatcher (2019): Visualizing new political ecologies: A critical data studies analysis of the World Bank's renewable energy resource mapping initiative. Geoforum 102 (2019) 242-254. https://www.sciencedirect.com/science/article/pii/S0016718517300726