

Copernicus contribution to Infrastructures (Telecom, Energy, Finance)



COPERNICUS



Sentinels



FULL, FREE AND
OPEN DATA



...added-value products



Contributing
missions



In Situ



Land
Monitoring

Copernicus Land Monitoring service: Benefit areas and products examples

Ecosystems

Biodiversity

Agriculture

Forestry

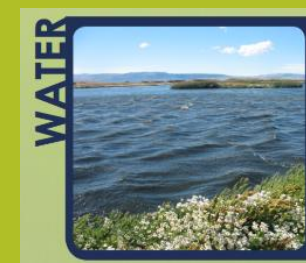
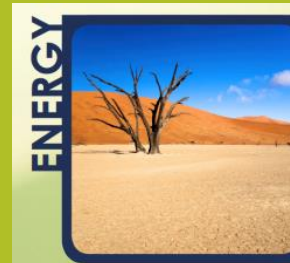
Energy

Natural Resources

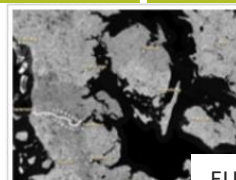
Water

Urban planning

Global



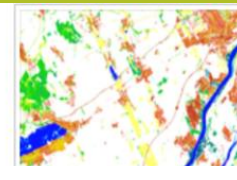
Pan-European



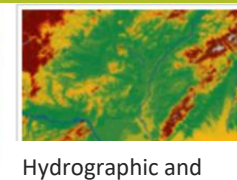
[Image Mosaics](#)



EU Land Cover



Specific land cover info



Hydrographic and
elevation reference
maps

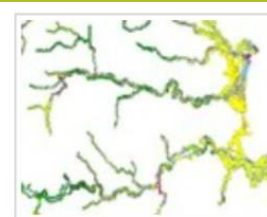


% of built-up area

Local



[Urban Atlas](#)



[Riparian Zones](#)



[Natura 2000 \(N2K\)](#)



European
Commission

Copernicus
Europe's eyes on Earth



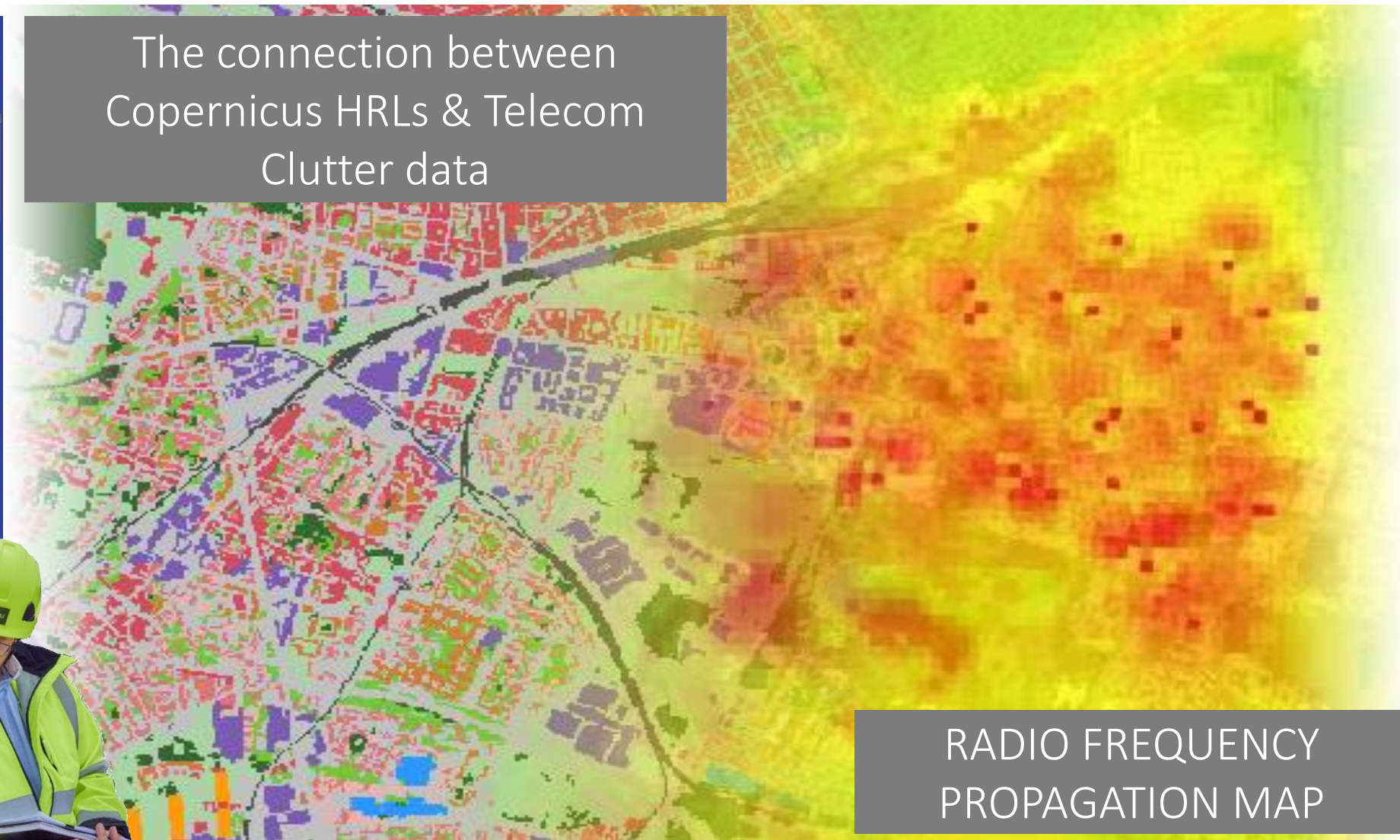
Land
Monitoring

Copernicus Land Monitoring Services supporting 5G network planning

The connection between
Copernicus HRLs & Telecom
Clutter data



T-Mobile



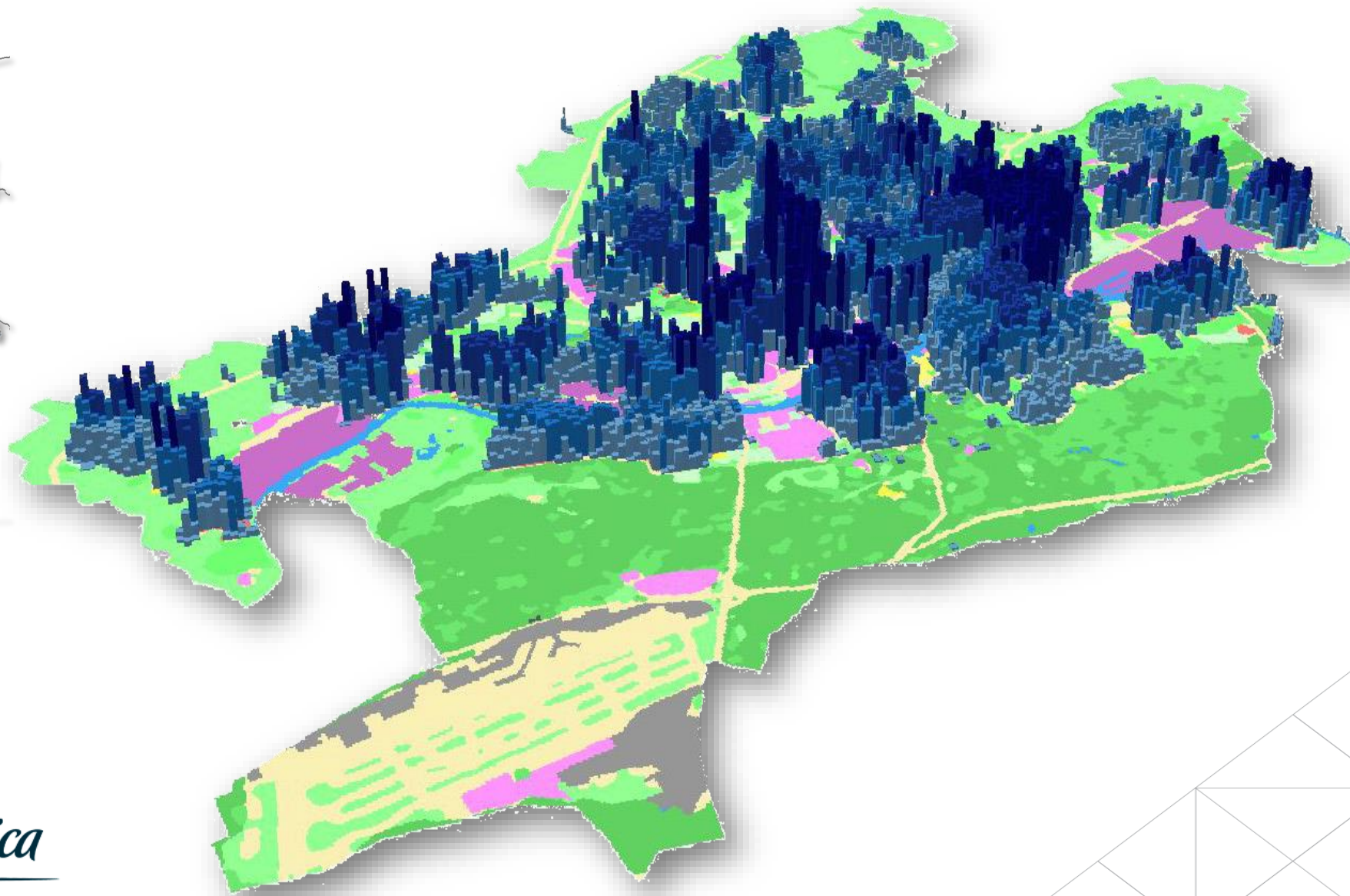
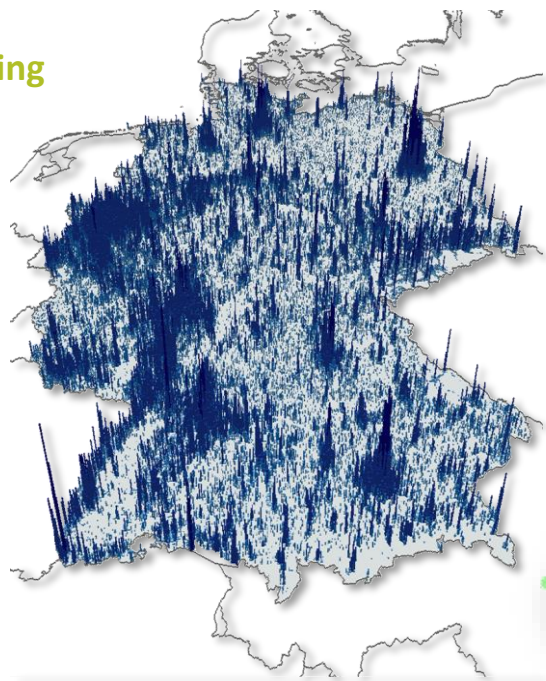
RADIO FREQUENCY
PROPAGATION MAP

https://www.geoville.com/fileadmin/geoville/GeoVille_ICT_ClutterData_web.pdf



Land
Monitoring

Business Intelligence & Geomarketing

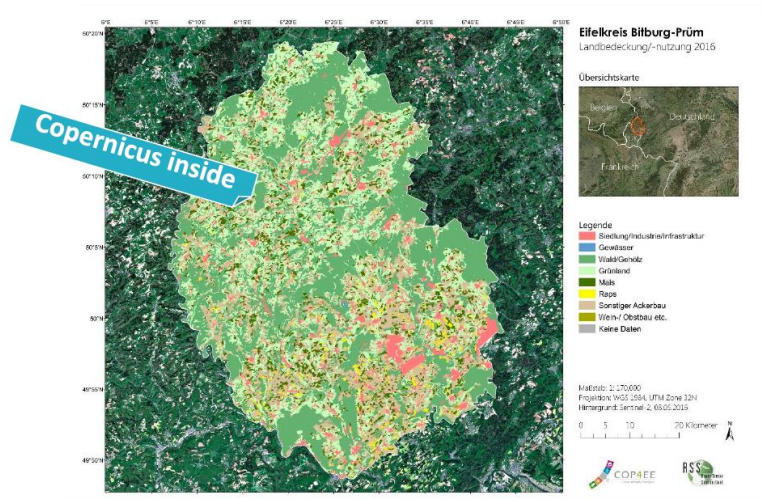


Telefónica

WORLD DATA LAB



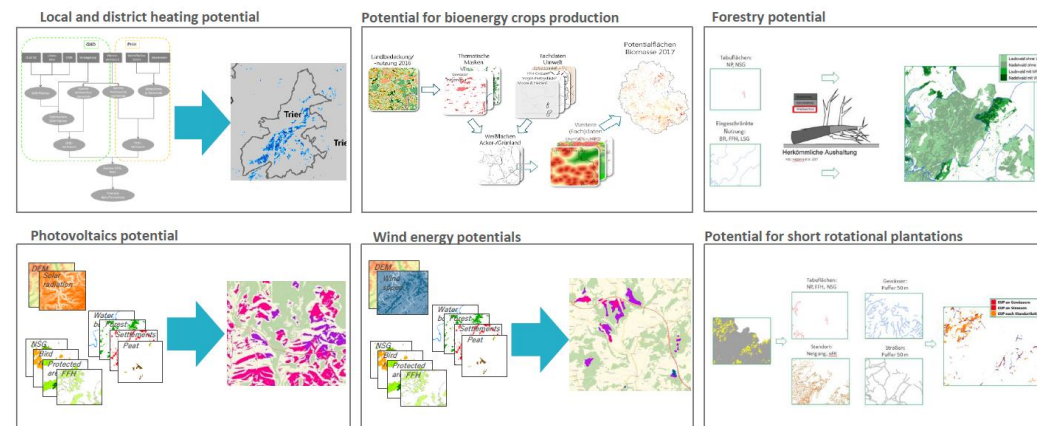
Yearly update of the LULC incl. crop types



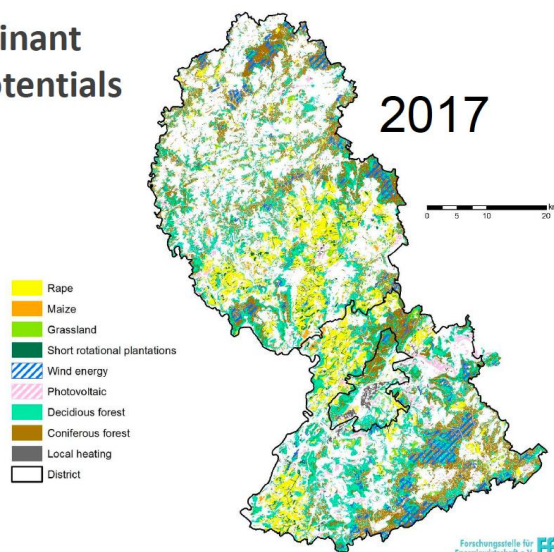
Jonas Franke, RSS GmbH

Copernicus4Energy, Brussels, 12.10.2017

Overview of the potential assessments for all sources of renewables

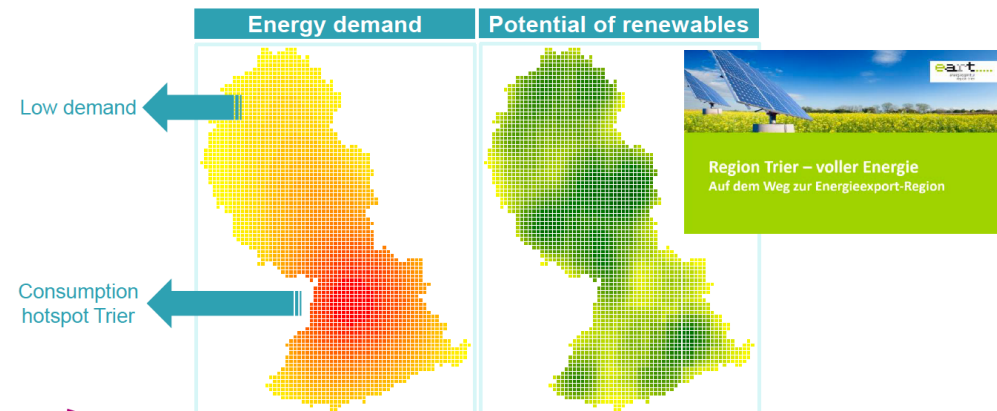


Complete set of dominant renewable energy potentials



Forschungsstelle für
Energiewirtschaft e.V. ffe

Regional distribution of demand and potential



Jonas Franke, RSS GmbH

Copernicus4Energy, Brussels, 12.10.2017



POWER INFRASTRUCTURES IN PORTUGAL

IMAGERY PREPARATION



- Orthorectification
- Atmospheric correction
- Pansharpening

S1. ASSESSMENT OF THE SERVICE STRIPS CONDITION

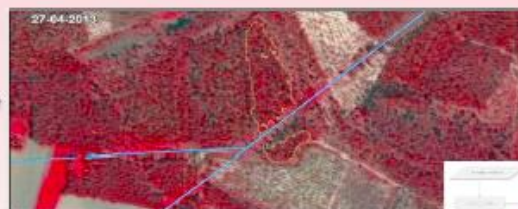
Characterization of the land use in the AOI and extraction of trees



- Area determination of the service strips occupied by trees
- Calculation of tree density in the service strips
- Measurement from the strip to the nearest tree and definition of risk classes
- Determination of affected strip length



S2. CONTROL OF ESP INTERVENTIONS

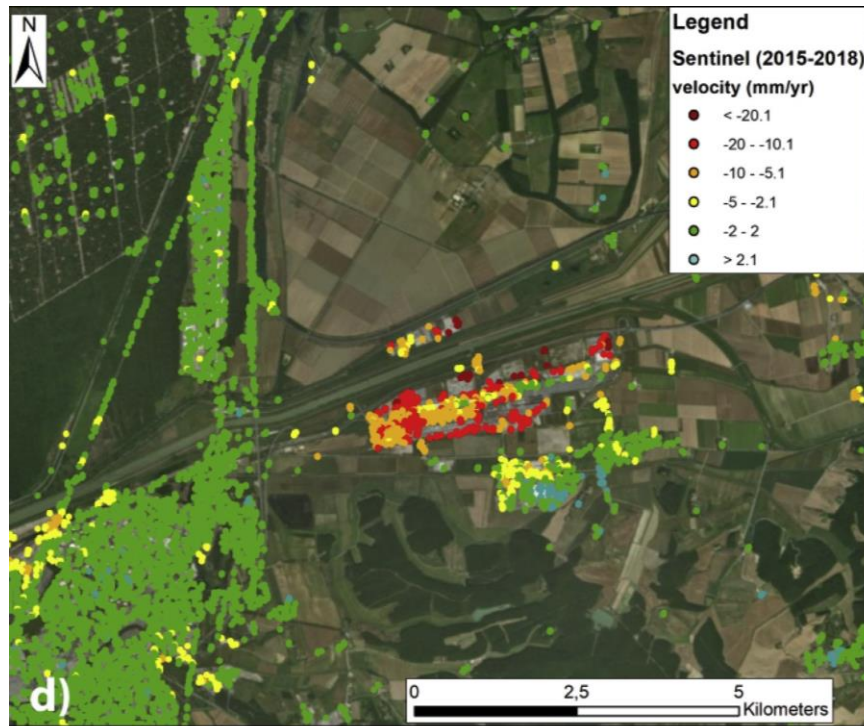


- Determination of vegetation decreases, in number and area, between the imagery dates

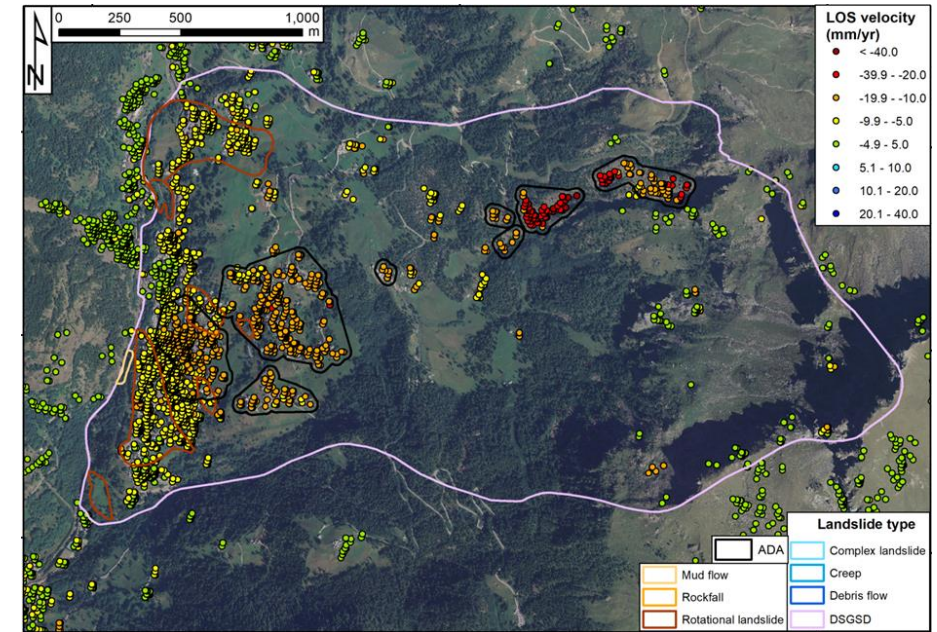


European Ground Motion Service – Application areas

- Natural and man-induced geohazard risk assessment
- Geodesy
- Land management, urban and rural planning
- Climate services
- Infrastructure development and management
- Mining and other natural resources extraction



From Ciampalini et al. "Evaluation of subsidence induced by long-lasting buildings load using InSAR technique and geotechnical data: The case study of a Freight Terminal (Tuscany, Italy)"



From Solari et al. "Satellite interferometric data for landslide intensity evaluation in mountainous regions"

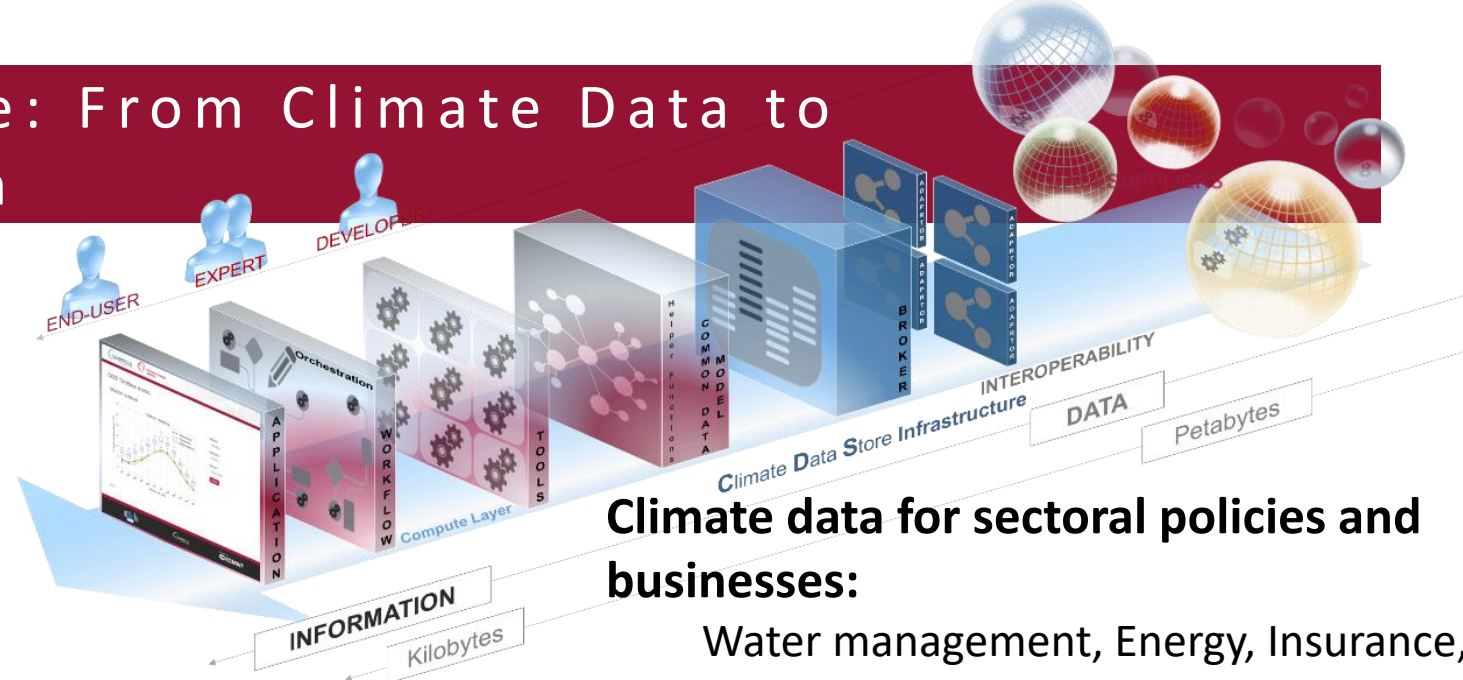
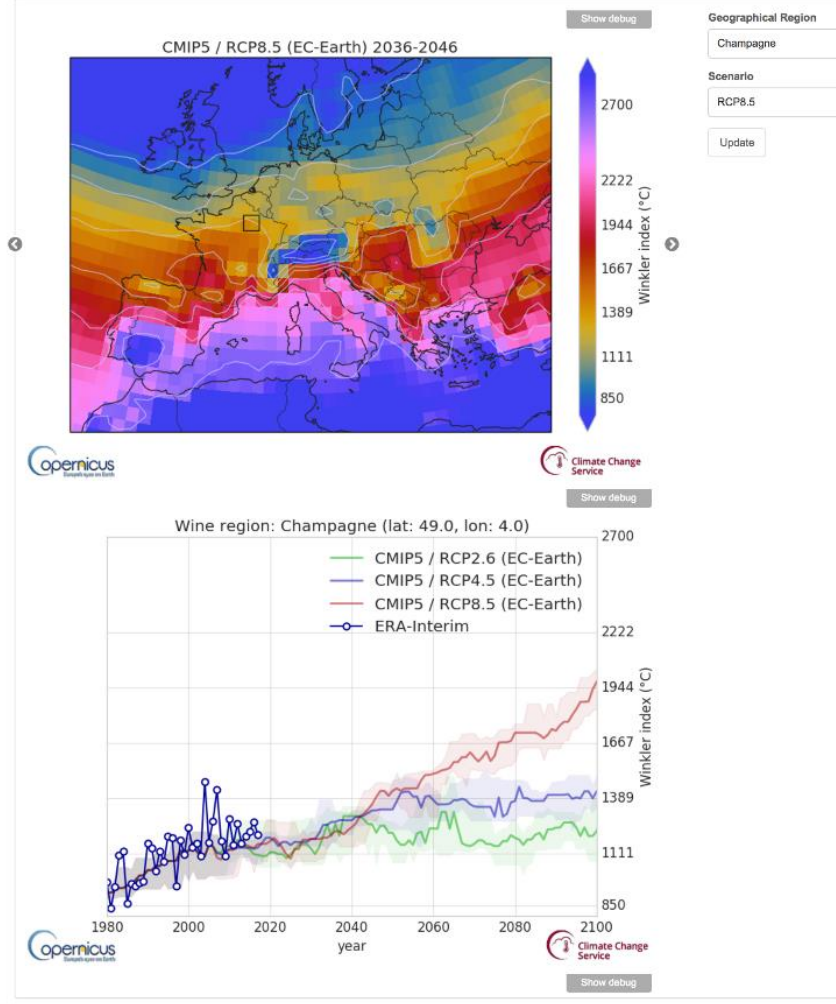
- Dam and groundwater monitoring
- Insurance topics and litigations
- Structural and civil engineering
- Cultural heritage
- The property market
- Railway and road management



Climate
Change

Climate Change Service: From Climate Data to Actionable Information

CDS Toolbox App.



Climate data for sectoral policies and businesses:

Water management, Energy, Insurance, Tourism, Agriculture, Health, Coastal Areas, Biodiversity, etc.

WHAT WILL THE INFORMATION BE USED FOR?

The wealth of climate information will be the basis for generating a wide variety of climate indicators aimed at supporting adaptation and mitigation policies in Europe in a number of sectors. These include, but are not limited to, the following:



WATER MANAGEMENT



AGRICULTURE & FORESTRY



TOURISM



INSURANCE



TRANSPORT



ENERGY



HEALTH



INFRASTRUCTURE



DISASTER RISK REDUCTION



COASTAL AREAS

①

INFORMING

POLICY DEVELOPMENT TO PROTECT CITIZENS FROM CLIMATE-RELATED HAZARDS SUCH AS HIGH-IMPACT WEATHER EVENTS

②

IMPROVING

PLANNING OF MITIGATION AND ADAPTATION PRACTICES FOR KEY HUMAN AND SOCIETAL ACTIVITIES

③

PROMOTING

THE DEVELOPMENT OF NEW SERVICES FOR THE BENEFIT OF SOCIETY



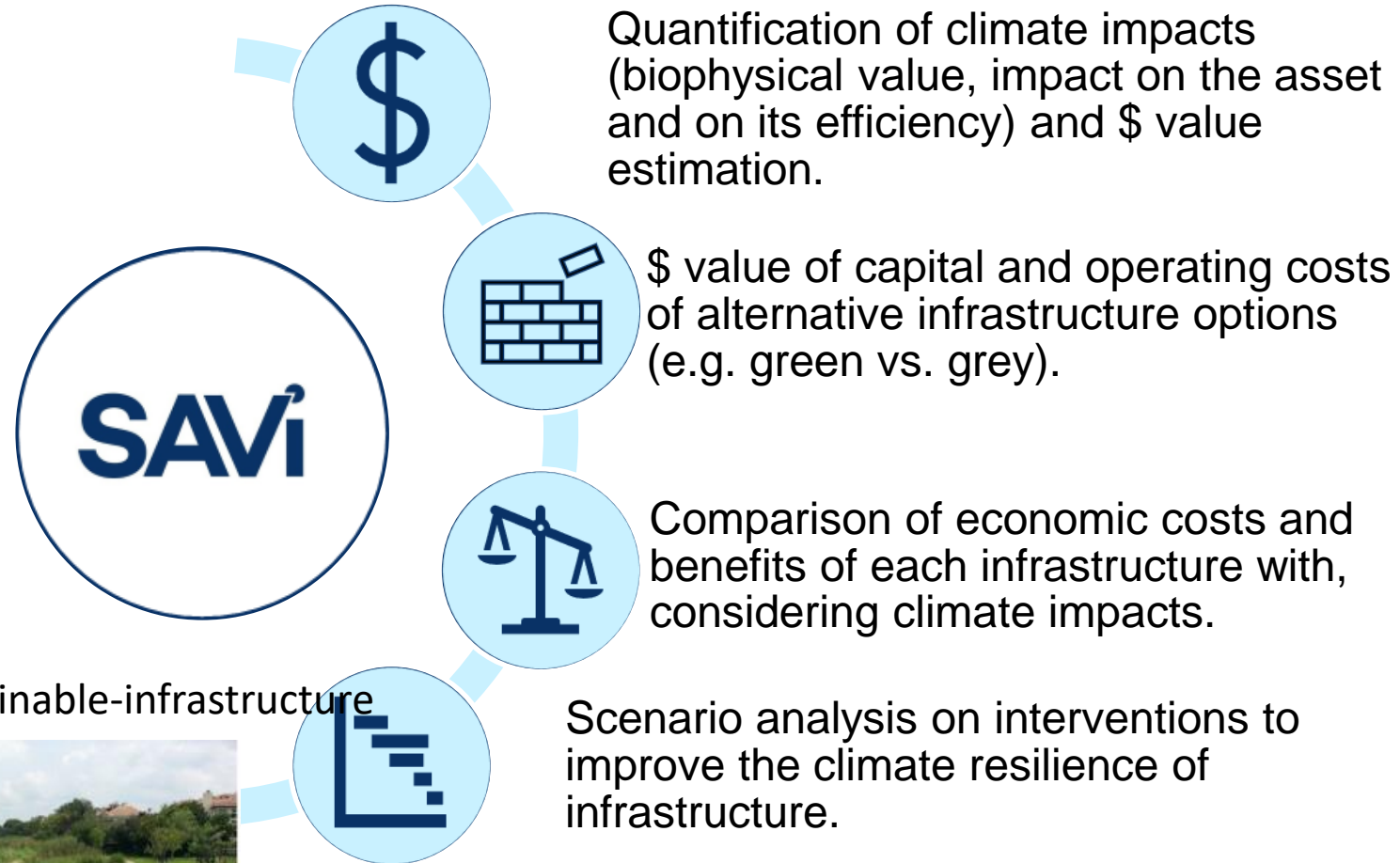
Climate
Change

Infrastructure: integration of C3S data in project finance modelling

How do key financial assumptions change as a result of climate change?

- Construction expenditure
- Construction time
- Operation expenditure
- Operation time
- Generation / production / output
- Cost of financing
- Sales price

<https://climate.copernicus.eu/climate-data-sustainable-infrastructure>

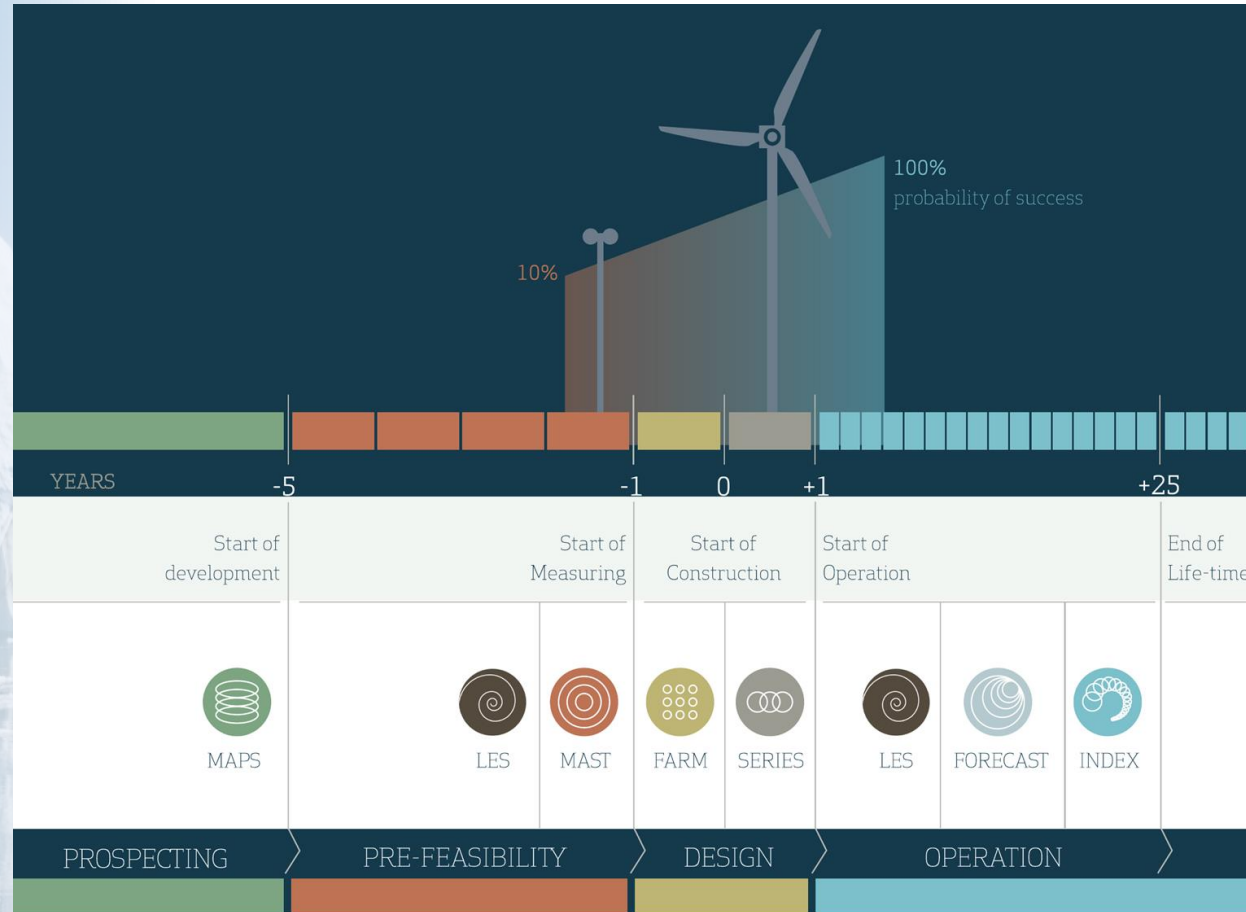




Climate
Change

Energy infrastructure

Example economic benefit C3S - wind industry



Windfarm development Project timeline and Vortex products

Vortex products allows to reduce the bias and uncertainty in the estimations of long-term wind speed corrections and spatial and vertical interpolation across the windfarm area.

Accurate Wind Resource matters:

- Cost of Energy ~ 70US\$/MW (IEA 2020)
- For a typical project of 100 MW with 35% capacity factor
- 1% AEP error reduction -> 230K US\$/years
- 50 GW installed/year -> 100M US\$/year

Injecting C3S ERA5 in Vortex products had reduced on average the wind speed error by 3-4% compared to other Reanalysis products *.

* estimation based validations results from more than 250 sites across different location and markets. Results are strongly regional and site dependent.

<https://climate.copernicus.eu/vortex>

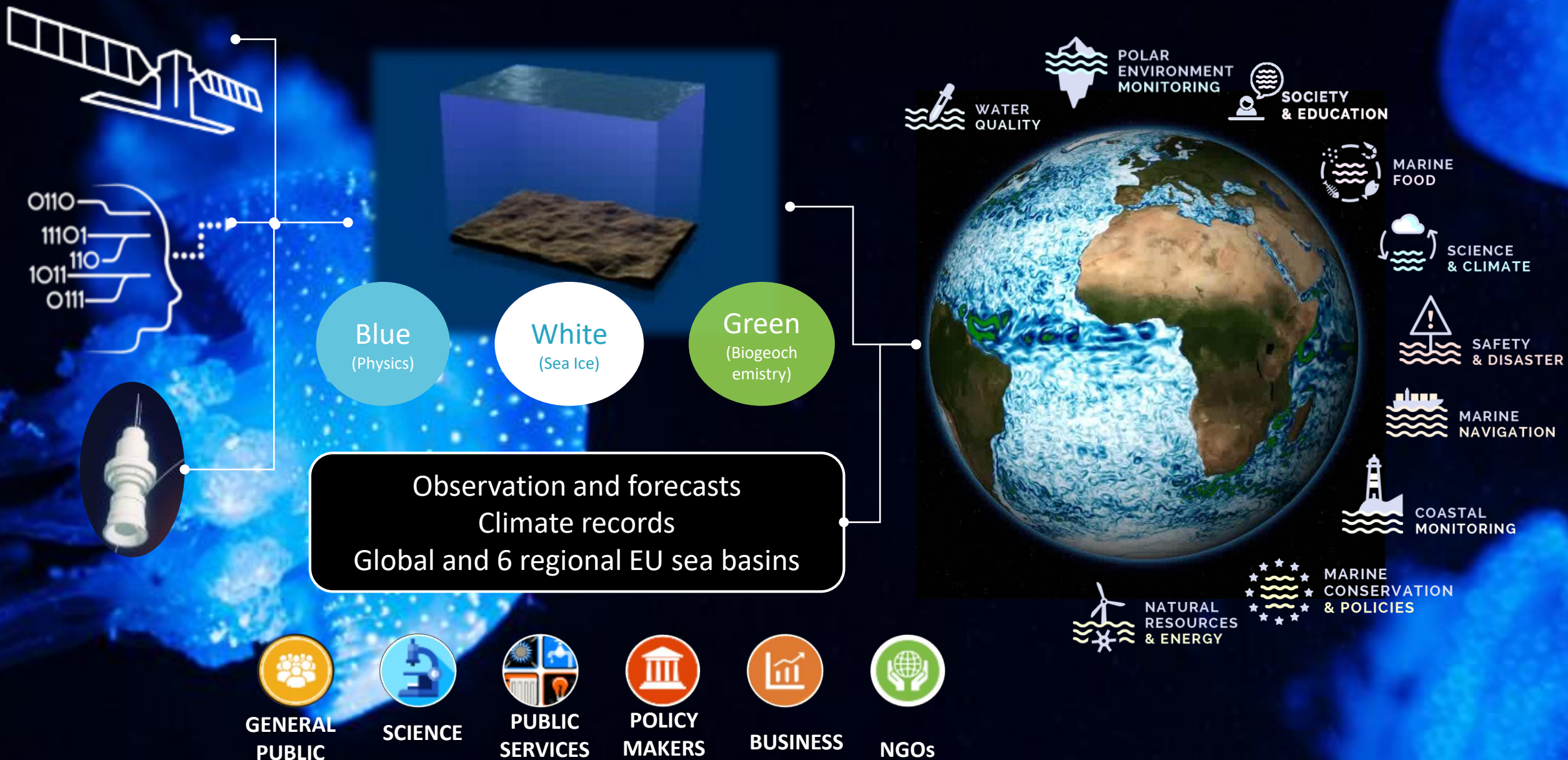


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The Copernicus Marine service



NATURAL RESOURCES & ENERGY

Copernicus Marine Service provides key data for the marine renewable energy sector and for the sustainable exploitation of oil & gas, and deep-sea mining resources.



AVAILABLE
VARIABLES



Research
institutes



National
& local
authorities



Governmental
& public
agencies

Private
companies



Startups

BENEFITS

- Safer implementation of energy platforms at sea
- More sustainable exploration and exploitation of natural resources

ENVIRONMENTAL & SOCIETAL IMPACTS

- Help with the mandatory environmental monitoring of offshore energy sites
- Minimize the risks for operations at sea
- Support the evaluation of energy resources (reduce prospection, exploration and costs)



Marine
Monitoring

Tidal energy assessment



Wave



temperature



salinity



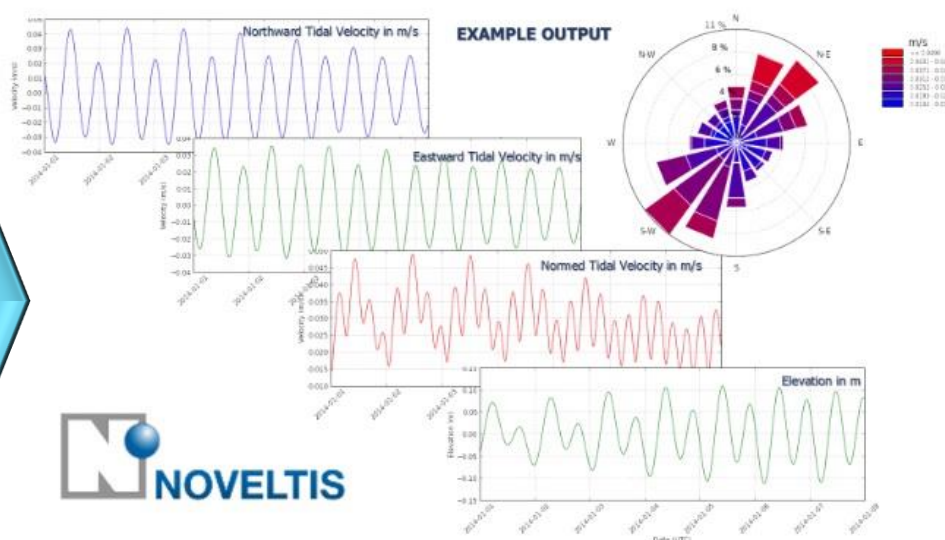
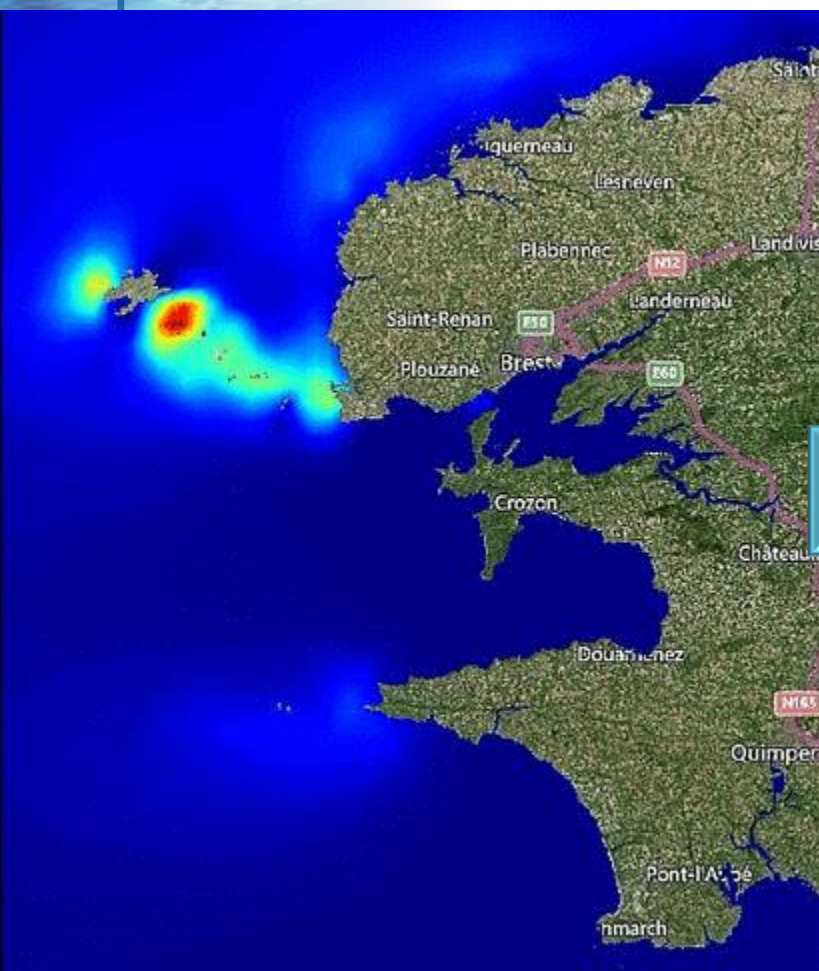
sea level



currents

Indicators based on ocean forecasts and ocean climate records for

- Maximum current speed
- Percentage of time where the current speed is higher than different thresholds (1.5 m/s, 3 m/s)
- Average Power Density



TidEA by NOVELTIS



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Marine
Monitoring

RENAQUA

Co-location Opportunities for RENEwable energies and AQUAculture facilities at coastal areas

- Identify suitable locations for aquaculture and marine renewable energy sectors
- Safer marine activities
- Optimization of operational maintenance
- Data Hub: centralized and interoperable access to the data sets in order to foster new added value

