Earth Observation Services and Products for Local and Regional Authorities

Catalogue of Services

EARSC
European Association of Remote Sensing Companies

June 2023

Table of Contents

Categorised as per EARSC Thematic Taxonomy

1. **Land** ..... **Fehler! Textmarke nicht definiert.**
   a. Agriculture ..... **Fehler! Textmarke nicht definiert.**
   b. Forests ..... **Fehler! Textmarke nicht definiert.**
   c. Land use / land cover ..... **Fehler! Textmarke nicht definiert.**
   d. Geology ..... **Fehler! Textmarke nicht definiert.**
   e. Topography & motion ..... **Fehler! Textmarke nicht definiert.**
   f. Snow & ice ..... **Fehler! Textmarke nicht definiert.**
   g. Inland water ..... **Fehler! Textmarke nicht definiert.**
   h. Biodiversity & land ecosystems ..... **Fehler! Textmarke nicht definiert.**
2. **Built environment** ..... **Fehler! Textmarke nicht definiert.**
   a. Transport networks ..... **Fehler! Textmarke nicht definiert.**
   b. Infrastructure ..... **Fehler! Textmarke nicht definiert.**
   c. Urban areas ..... **Fehler! Textmarke nicht definiert.**
   d. Waste ..... **Fehler! Textmarke nicht definiert.**
3. **Marine & maritime** ..... **Fehler! Textmarke nicht definiert.**
   a. Shipping ..... **Fehler! Textmarke nicht definiert.**
   b. Sea ice & icebergs ..... **Fehler! Textmarke nicht definiert.**
   c. Marine pollution ..... **Fehler! Textmarke nicht definiert.**
   d. Fisheries ..... **Fehler! Textmarke nicht definiert.**
   e. Biodiversity & marine ecosystems ..... **Fehler! Textmarke nicht definiert.**
   f. Coastal ..... **Fehler! Textmarke nicht definiert.**
   g. Metocean ..... **Fehler! Textmarke nicht definiert.**
4. **Security & safety** ..... **Fehler! Textmarke nicht definiert.**
   a. Customs & borders ..... **Fehler! Textmarke nicht definiert.**
   b. Health (epidemics & diseases) ..... **Fehler! Textmarke nicht definiert.**
   c. Food security & production ..... **Fehler! Textmarke nicht definiert.**
5. **Atmosphere & climate** ..... **Fehler! Textmarke nicht definiert.**
   a. Meteorology ..... **Fehler! Textmarke nicht definiert.**
   b. Atmosphere ..... **Fehler! Textmarke nicht definiert.**
   c. Climate change ..... **Fehler! Textmarke nicht definiert.**
6. **Disasters & geohazards** ..... **Fehler! Textmarke nicht definiert.**
   a. Floods ..... **Fehler! Textmarke nicht definiert.**
   b. Landslides ..... **Fehler! Textmarke nicht definiert.**
   c. Earthquakes ..... **Fehler! Textmarke nicht definiert.**
   d. Fires ..... **Fehler! Textmarke nicht definiert.**
   e. Volcanoes ..... **Fehler! Textmarke nicht definiert.**

1. Land

a. Agriculture

eoanalytics
Aerial Mapping & Remote Sensing
www.eoanalytics.ie

Dr. Guy Serbin, CEO
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EOanalytics is a Dublin-based Earth observation (EO) startup, incorporated in November 2018. We support operational, research and development, educational, and consulting activities. Our primary area of interests are:

- Agricultural and environmental applications, including crop production, area, and yield (PAY) estimation, tillage intensity monitoring, fire fuel monitoring, and land cover land use change detection.
- Geospatial big data management and delivery for spatiotemporal analyses.
- Improved satellite and airborne EO sensors.
- Machine learning and edge processing of EO data for real time mapping and monitoring.

Our staff have used multi- and hyperspectral remote sensing data at different scales (satellite, airborne, UAV, and photospectrometry) for a number of applications:

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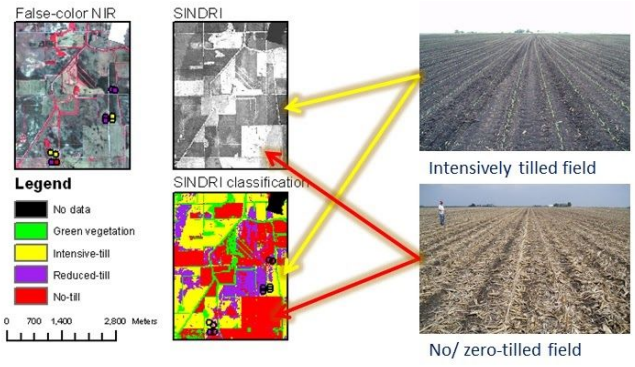

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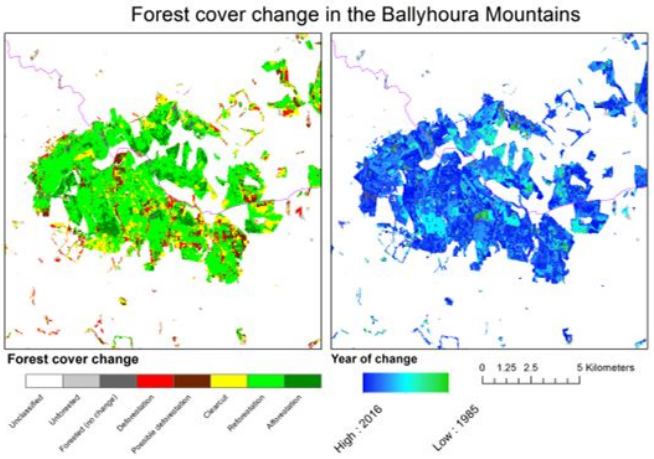
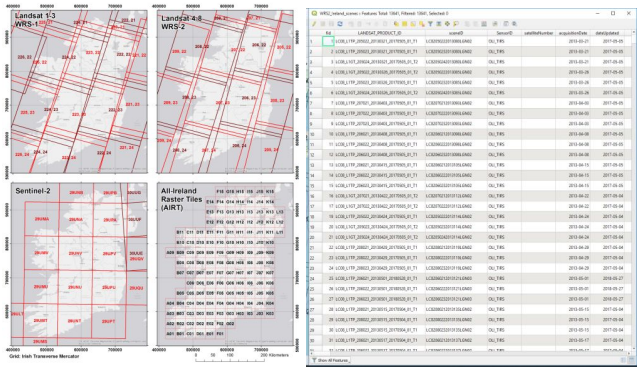
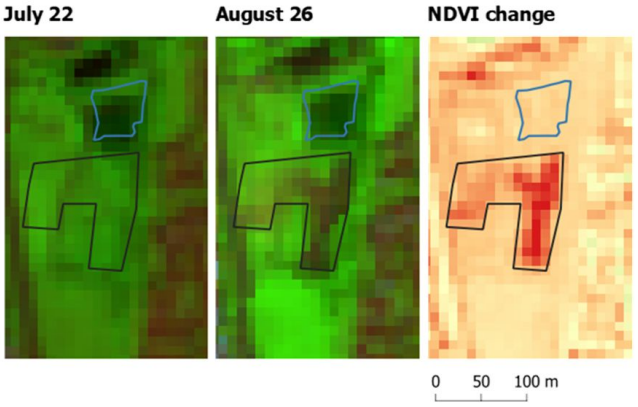


The Irish Earth Observation (IEO) Python satellite data management module



Urban habitat destruction in Sean Walsh Memorial Park from Sentinel-2, Tallaght, Ireland, 2019



Company profile

Address
Sparkassenplatz 2
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Contact Person
Andreas Walli
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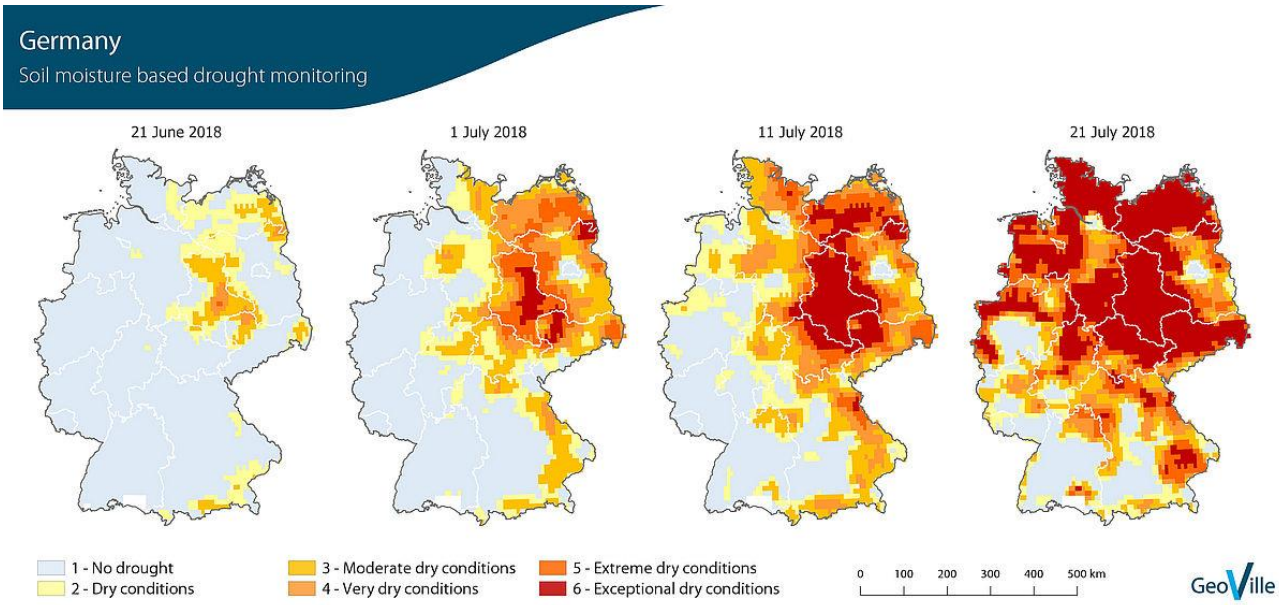
Company description:

GeoVille (http://www.geoville.com) is an internationally operating company, providing consultancy, services and products related to remote sensing, geo-information and geographic information systems and has longstanding experience in the field of environmental monitoring, focusing on the development of a multi-scale and multi-purpose land monitoring system.
GeoVille's focus is on the integration of satellite earth observation-based information and in-situ data to provide assessment and monitoring services. We enable geographic accounting of human and natural dynamics through a satellite's eye, adding the spatial dimension to information gathering, analysis and monitoring, for policy support and informed decision making.



Services:
This EO service provides time-series information on droughts by determining surface dryness and soil moisture anomalies as well as vegetation stress and degradation. Climate change is expected to increasingly impact precipitation patterns and evapotranspiration processes. Thus, there will be a significant influence on the availability of soil and groundwater leading to higher frequent, longer and more severe droughts in many regions. With regard to climate change monitoring and Green Deal Reporting Obligations the services support the Sustainable Development Goal Reporting SDG Target 1.5, Target 2.4, Target 6.4, Target 13.1, Target 15.3

Products (in bullet points):
Drought extent and severity maps:

- Identifying droughts
- Influence on the availability of soil and groundwater
- Spatial resolution available at different scales (e.g. 10m from 2016 onwards)
- Temporal coverage from 2001 until now
- Temporal resolution from monthly to seasonal

Derived indicators:

- Vegetation stress
- Soil moisture anomaly
- Trend analyses
- Hazard extent map / Risk exposure
- Crop zoning agriculture
- etc.

References:
[1] https://www.geoville.com
[2] https://www.copernicus.eu/en/european-drought-observatory

Data used:
Satellite data: Optical (Sentinel-2, Landsat-8, MODIS, Geostationary satellites); Radar (Sentinel-1, MetOp ASCAT, SMAP, TRMM, SSM/I)
Supporting data: (in-situ information of drought parameters)

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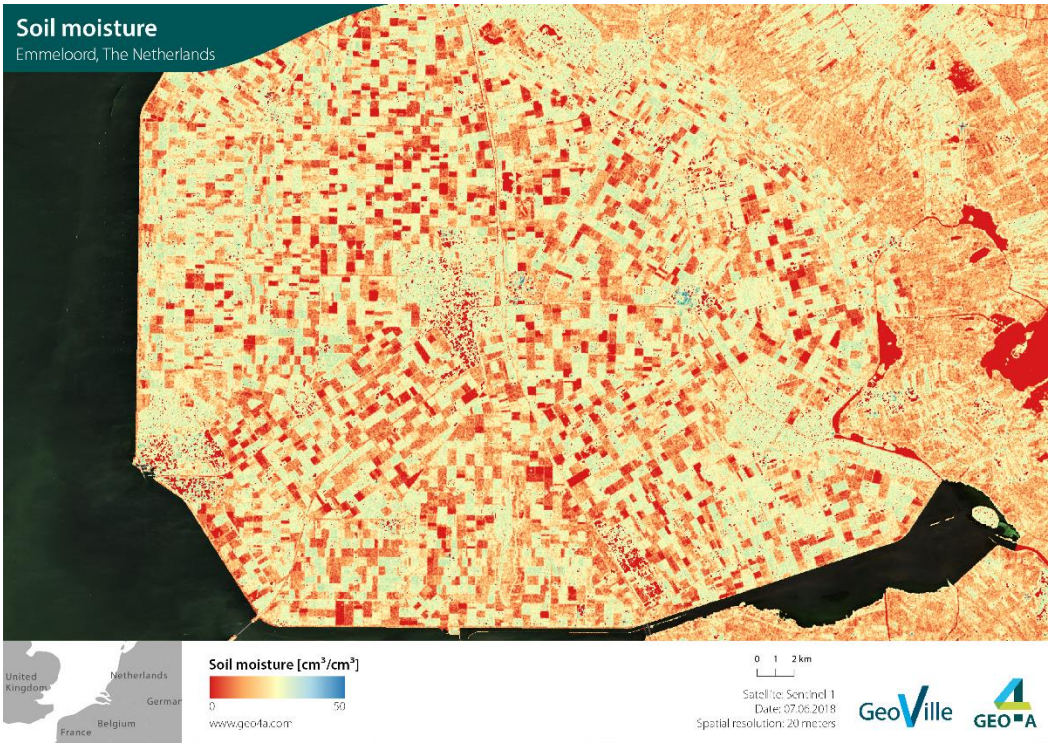

High resolution soil moisture based on Sentinel-1 (Emmeloord, The Netherlands) (Source: GeoVille/Geo4A)

Services:
EO provides global, seamless surface soil moisture information, measuring the moisture content of the top five centimeters of soil. Soil moisture plays an important role for the environment and the climate system. With regard to climate change monitoring and Green Deal Reporting Obligations the services support the Sustainable Development Goal Reporting SDG Target 6.4, Target 6.6, Target 14.3, Target 15.3

Products (in bullet points):
Soil moisture information and related indicators
- Surface soil water information based on a decadal (10-day average) Index data
- Degree of saturation of the topmost soil layer (< 5 cm) and is given in percent, ranging from 0% (dry) to 100% (wet)
- Soil Water Index represents the soil moisture content in the first 1 meter of the soil in relative units ranging between wilting level (0) to field capacity (100)
- Spatial resolution: 10m – 25km
- Temporal resolution: Near real time product, various time steps and long historic archives

Derived indicators
- Surface soil water information
- Soil Water Index
- Impact on crop productivity
- Identification of specific stresses and vegetation problems

References:
[1] https://www.geoville.com/
[2] https://land.copernicus.eu/global/themes/vegetation
[3] https://www.esa-soilmoisture-cci.org/

Data used:
Satellite data: Radar (Sentinel-1, SMAP, MetOp ASCAT)
Supporting data: in-situ data

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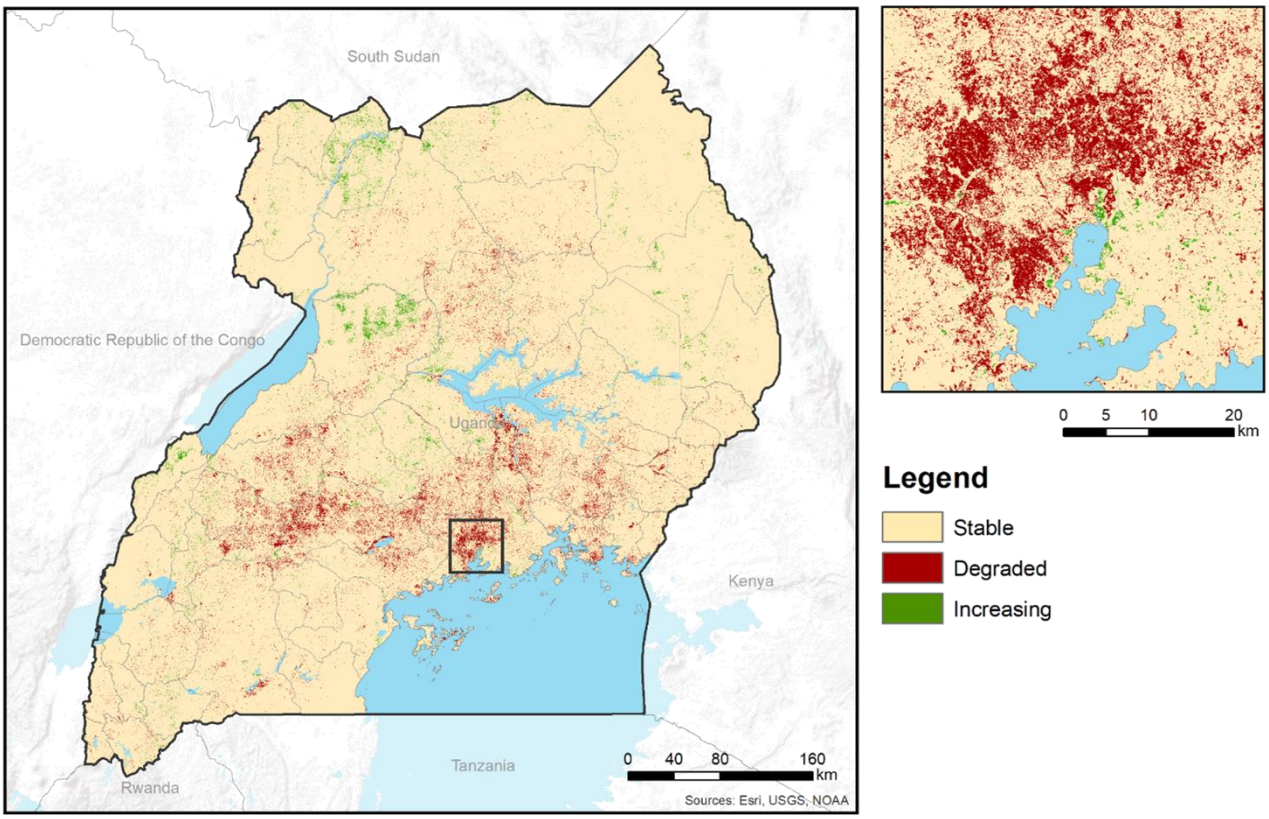

Services:
The service aims at measuring and monitoring land degradation by calculating the ratio between the degraded land area and the total land area of a country. With regard to climate change monitoring and Green Deal Reporting Obligations the services support the Sustainable Development Goal Reporting SDG Target 15.3

Products (in bullet points):
Land Cover:

- Changes in distribution of vegetation types, and human-impacted infrastructure, reflecting the use of land resources (i.e., soil, water and biodiversity) for agriculture, forestry, human settlements and other purposes
- Spatial resolution reaching from VHR to HR

Land Productivity:

- Total above-ground net primary production (NPP) defined as the energy fixated by plants minus their respiration which translates into the rate of biomass accumulation that delivers ecosystem services
- Spatial resolution reaching from VHR to HR

References:
[1] https://www.geoville.com
[2] https://www.esa-landcover-cci.org/
[3] https://land.copernicus.eu/global/products/lc
[4] http://publications.jrc.ec.europa.eu/repository/handle/JRC80541
[5] http://www.fao.org/soils-portal/soil-survey/soil-maps-and-databases/harmonized-world-soil-database-v12/en/

Data used:
Satellite data: Sentinel-2, Landsat, Sentinel-3, MODIS, MERIS, VIIRS, SPOT Vegetation, PROBA-V, Commercial satellites
Supporting data: Global datasets (e.g. CCI, Copernicus Dynamic Land Cover, JRC's Land Productivity Dynamics (LPD) dataset, Copernicus Global Land Service products, Harmonized World Soil Database (HWSD), etc.

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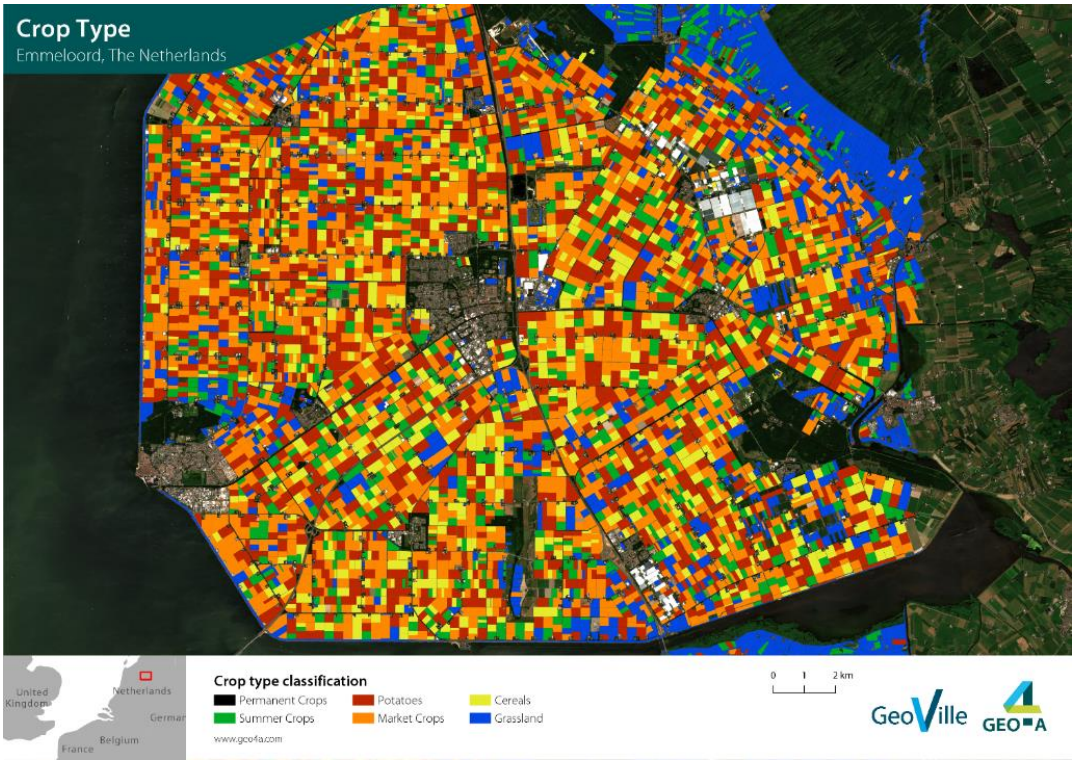

Crop types in a selected area of interest (Emmeloord, The Netherlands) (Source: GeoVille/Geo4A)

Services:
The crop type detection service provides information on types and location of crops grown with different levels of detail. With regard to climate change monitoring and Green Deal Reporting Obligations the services support the Sustainable Development Goal Reporting SDG Target 2.3, Target 2.4, Target 6.4, Target 15.4

Products (in bullet points):
Crop type and condition:
- Besides summer and winter crops, various types such as potatoes, maize, cereals, and other field crops can be detected using Earth observation techniques.
- Spatial resolution: 10m
- Temporal resolution: from the beginning of the respective growing season, various time steps

Derived indicators:
- Regional yield statistics
- Functionalities of plants, early stress detection
- Information on crop rotation and on crop (seasonal) calendar
- Risk exposure
- Information of vegetation stages
- Detect crop damage at field level
- Impact on food security

References:
[1] https://www.geoville.com
[2] https://www.geo4a.com

Data used:
Satellite data: Optical (Sentinel-2, Landsat-7, Landsat-8, or commercial VHR / HHR satellite data), Radar (Sentinel-1)
Supporting data: Field parcel delineation; in-situ crop type information such as LPIS

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Company's description:

NEO is a Dutch international earth observation service provider, celebrating its 24th anniversary. We provide services that create value by sensing the dynamics of our habitat. NEO serves over 200 customers, located both in the Netherlands and globally. With its 30 Geo- and EO-specialists in 2019 the company is independent from all providers of imagery, software and other organizations.

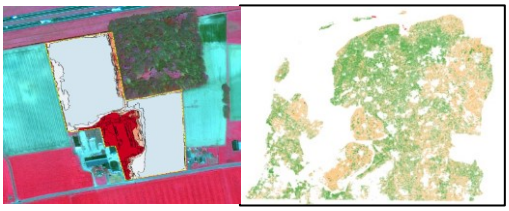
NEO is a leader in the monitoring and the change detection of geo-objects, such as forests and trees, agricultural parcels, nature reserves, but also of buildings, infrastructure, roads and water courses, etc. NEO's mission is to support organizations in keeping track of the dynamics of and on our planet. Our information helps our customers to reduce costs, increase safety, prevent errors, to comply with regulations and to manage our environment better. That is how we have impact on both industry and society.

NEO concentrates on solving technological and process challenges in monitoring of geo-objects using earth observation tools. The complex process to secure and update information from images has been mastered in SignalEyes®, NEO's certified work process (ISO9001 Quality Management and ISO27001 Information Security).

Change signalling services

Our change signalling services make use of state-of-the–art automated image classification algorithms based on artificial intelligence, so as to be able to process the ever increasing data volume. This allows for data driven processes and decision making for our clients. We deliver near real-time information as a service, in the form of **call-to-actions** for our clients. Some examples of NEO's services are given below.

Agricultural monitoring
Service to monitor agricultural activities and precision agriculture, such as harvesting, heterogeneity. Additionally: control with remote sensing supporting common agricultural policy regulations and automated change detection of LPIS registry geometries. In The Netherlands on behalf of the Paying Agency of the Ministry of Agriculture, also in Denmark and Sweden.



Tree monitoring
The Tree Register is a service providing information on all trees in the Netherlands (location, height) that supports clients in tree management and law enforcement tasks. Additionally sustainability of urban environments can be monitored.

Pipeline monitoring
Our pipeline monitoring services deliver near-real time information and calls-to-action that safeguard pipeline integrity and environmental safety. We help to reduce risks and costs.

Monitoring waterways
Waterways are monitored to reveal changes in geometry (new ditches, filled waterways, water quality, (floating) vegetation. Both policy makers and maintenance of waterways is supported.

Solar Panel monitoring
The service contains detailed information on locations of solar panels and properties (inclination, azimuth, peak power). The monitoring of solar panels is performed using aerial imagery and satellite imagery. Sustainability goals are monitored.

Imperviousness monitor
The imperviousness product monitors imperviousness and permeability of the surface. It allows for reliable analyses and supports policy and planning processes.

1. Land

b. Forests

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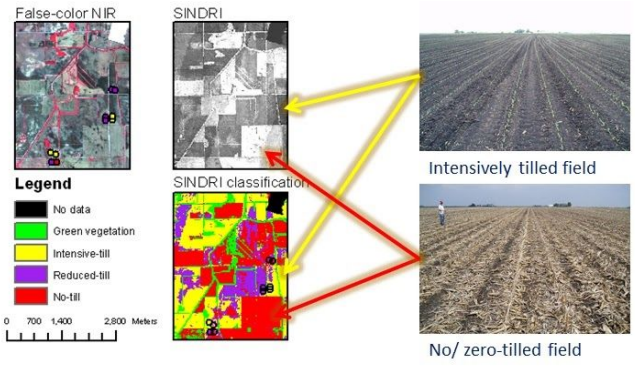

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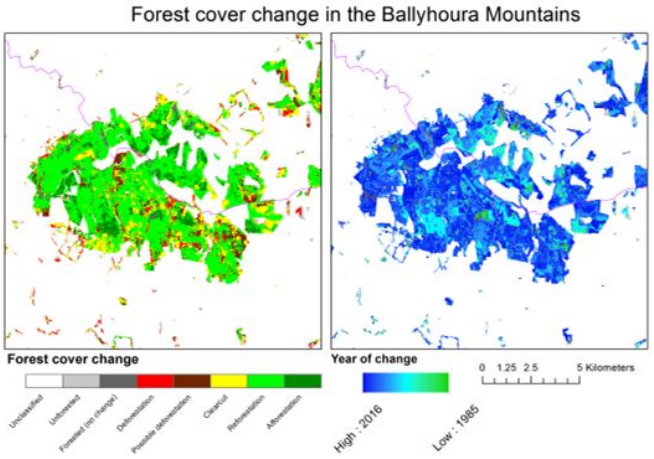

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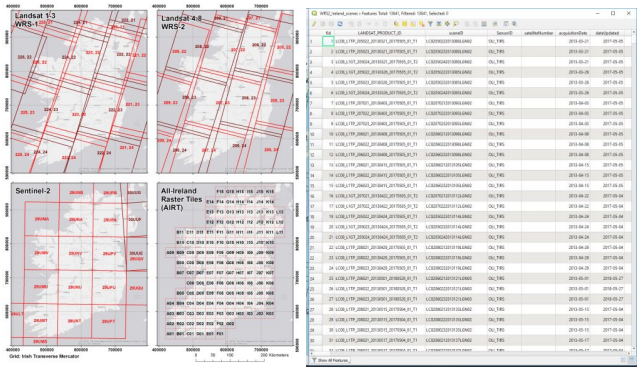

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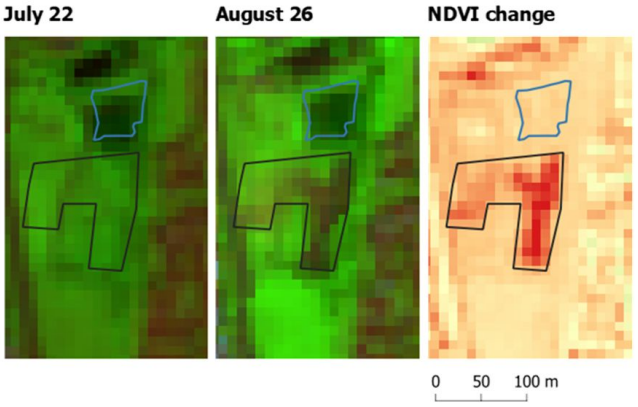

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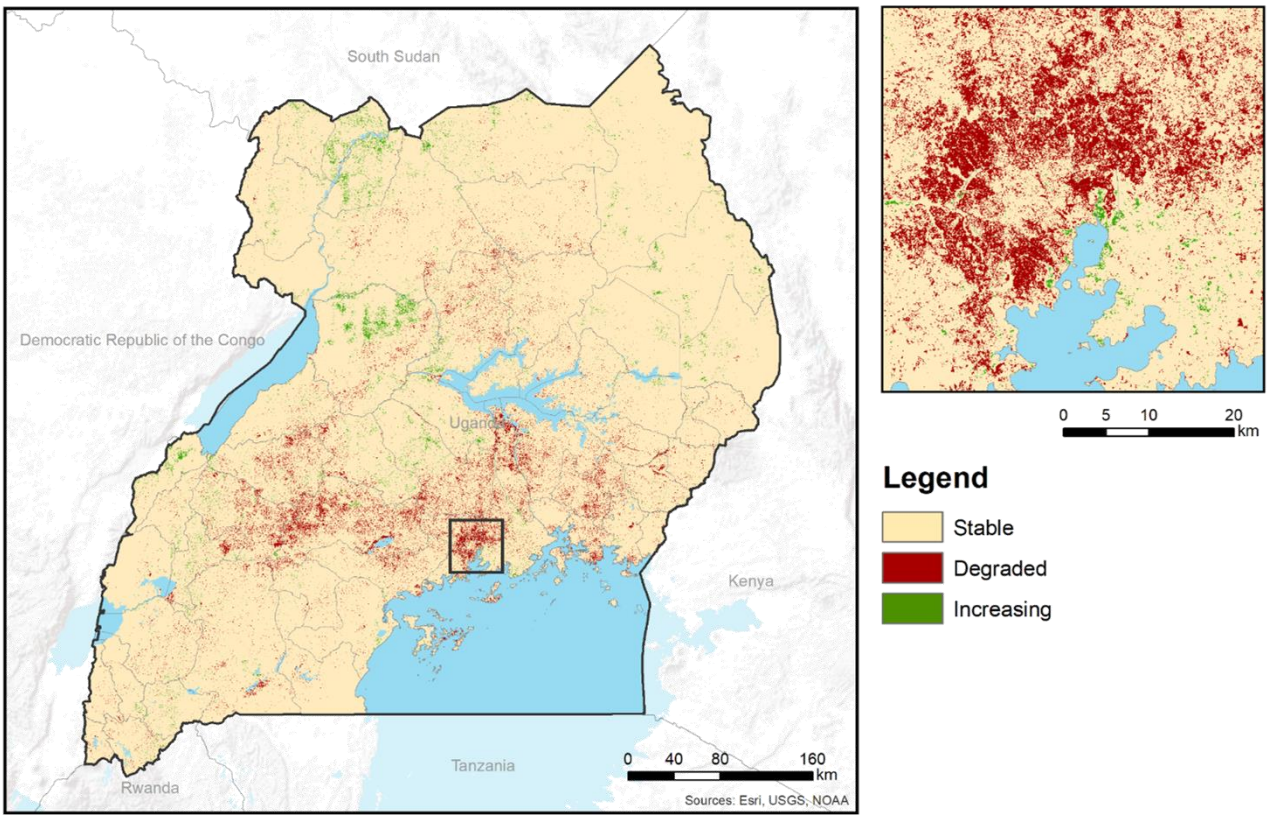

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Products (in bullet points):
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Land Productivity:

- Total above-ground net primary production (NPP) defined as the energy fixated by plants minus their respiration which translates into the rate of biomass accumulation that delivers ecosystem services
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[1] https://www.geoville.com
[2] https://www.esa-landcover-cci.org/
[3] https://land.copernicus.eu/global/products/lc
[4] http://publications.jrc.ec.europa.eu/repository/handle/JRC80541
[5] http://www.fao.org/soils-portal/soil-survey/soil-maps-and-databases/harmonized-world-soil-database-v12/en/

Data used:
Satellite data: Sentinel-2, Landsat, Sentinel-3, MODIS, MERIS, VIIRS, SPOT Vegetation, PROBA-V, Commercial satellites
Supporting data: Global datasets (e.g. CCI, Copernicus Dynamic Land Cover, JRC's Land Productivity Dynamics (LPD) dataset, Copernicus Global Land Service products, Harmonized World Soil Database (HWSD), etc.

Company profile

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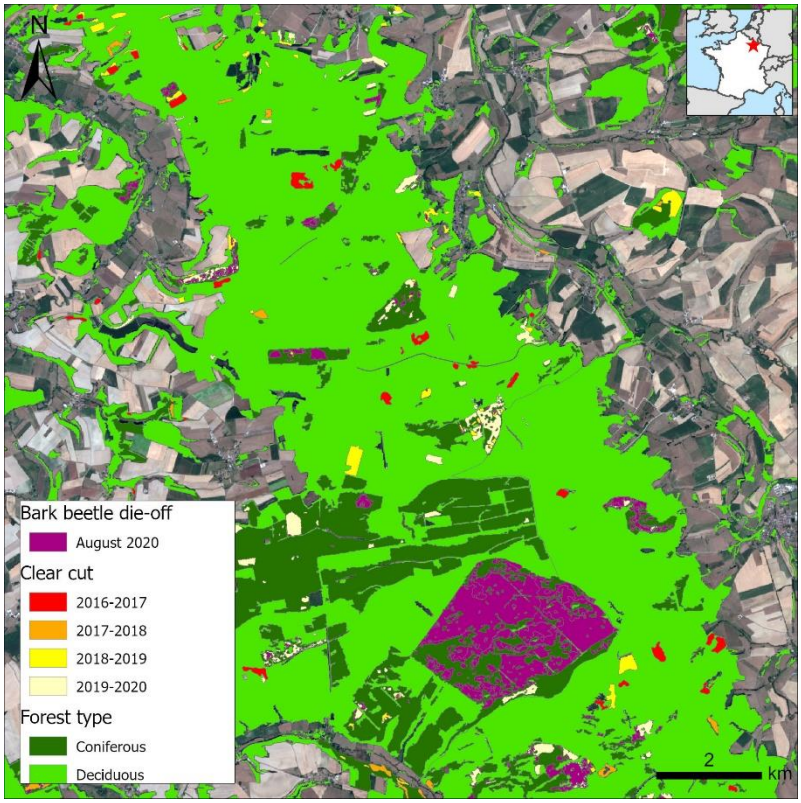
Company description:

For more than 30 years, ICube-SERTIT is a pioneer in exploiting satellite data to derive information that has high societal impact. In a world marked by climate change, natural disasters, environmental degradation and constant pressure on resources, ICube-SERTIT delivers a wide range of services to its customers: public services, international institutions, private sector, including the insurance sector.
Using satellite and aerial imagery, ICube-SERTIT designs products that meet societal needs in various domains (emergency mapping, risk and reconstruction, water & forest management, land use & urban planning…) using cutting edge technology and methods including Machine Learning and AI, while combining Earth Observation (EO) derived layers with increasingly abundant ancillary geo-spatial data to provide services tailored to client requests.



Services:
ICube-SERTIT uses satellite imagery to provide a list of forestry related services, including for instance forest cover mapping and monitoring with tree types and species differentiation, assessment of one-off events (storms, fires, parasitic attacks…) impact and consequences on forests, or detailed tree stands characterization through EO derived height and density indexes.

Products (in bullet points):
Forest mapping:
- Forest cover extent
- Clear-cuts, reforestation, afforestation

Forest characterization:
- Tree types and species differentiation
- Tree stands height and density indexes for sylvicultural management purposes

Impact and consequences of rapid/long-lasting changes:
- Bark beetle die-offs
- Windfall damage mapping
- Forest fire mapping and forestry recolonization

References:
[1] https://sertit.unistra.fr/en/wp-content/themes/sertitheme/assets/prestations-assets/prestations/pdf/en/04_ICube-SERTIT_Portfolio_2021_EN_Forest.pdf
[2] https://sertit.unistra.fr/en/wp-content/themes/sertitheme/assets/prestations-assets/prestations/pdf/en/05_ICube-SERTIT_Portfolio_2021_EN_ClearCuts.pdf
[3] https://data.public.lu/en/datasets/regiowood-forest-types-2016/

Data used:
Satellite data: All kinds of optical (Sentinel-2, SPOT 6-7, Pléiades...) and SAR (Sentinel-1) imagery
Ground data: Tree stands characteristics resulting from in-field campaigns

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NEO is a leader in the monitoring and the change detection of geo-objects, such as forests and trees, agricultural parcels, nature reserves, but also of buildings, infrastructure, roads and water courses, etc. NEO's mission is to support organizations in keeping track of the dynamics of and on our planet. Our information helps our customers to reduce costs, increase safety, prevent errors, to comply with regulations and to manage our environment better. That is how we have impact on both industry and society.

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Our change signalling services make use of state-of-the–art automated image classification algorithms based on artificial intelligence, so as to be able to process the ever increasing data volume. This allows for data driven processes and decision making for our clients. We deliver near real-time information as a service, in the form of **call-to-actions** for our clients. Some examples of NEO's services are given below.

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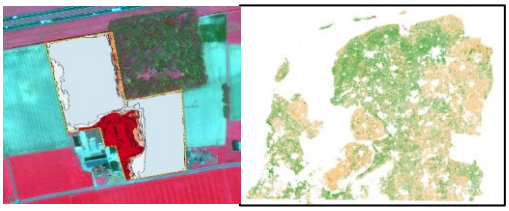

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The service contains detailed information on locations of solar panels and properties (inclination, azimuth, peak power). The monitoring of solar panels is performed using aerial imagery and satellite imagery. Sustainability goals are monitored.

Imperviousness monitor
The imperviousness product monitors imperviousness and permeability of the surface. It allows for reliable analyses and supports policy and planning processes.

PHOTOMAP

Company profile

PHOTOMAP s.r.o
Poludníková 3/1453
040 12 Košice
Slovakia
TAX ID: SK2021736145
https://www.photomap.sk

Contact Person
Mgr. Miloslav Ďurica, CEO
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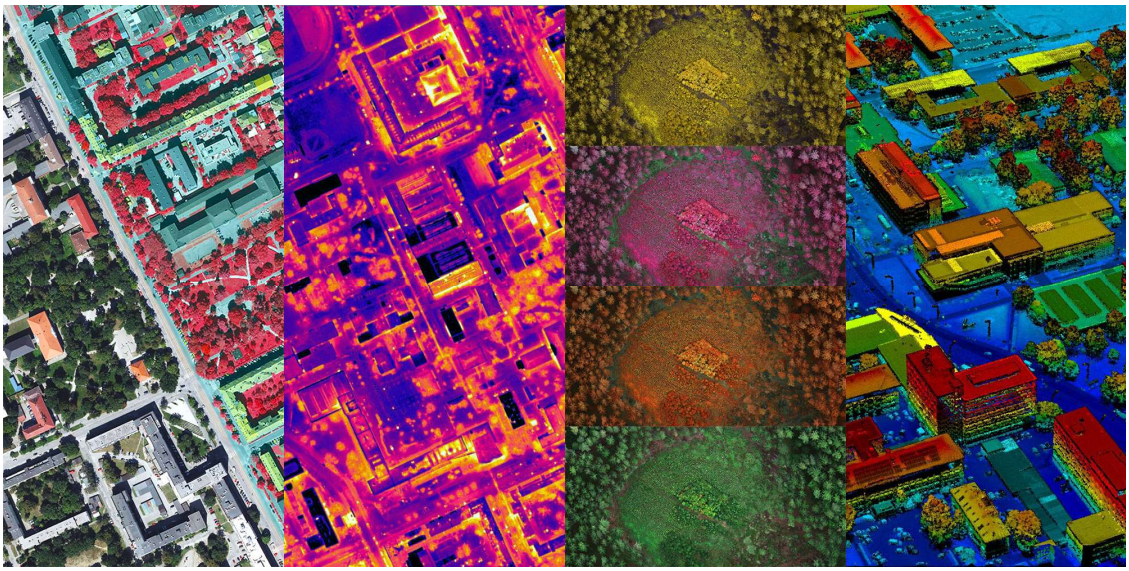
durica@photomap.sk

Company's description:

PHOTOMAP is a Slovak remote sensing company that specializes in geospatial data acquisition, processing, and analysis. Our key strength lies in the long unrivalled experience dated since 2003 in using a variety of platforms and sensors. We operate several UAVs, aircrafts and cooperate with satellite data providers in order to deliver the most suitable and accurate products for your project needs. With our ability to deliver multispectral, thermal, hyperspectral, lidar and radar data products and analysis, we can satisfy even the most demanding clients.



Several product examples: RGB/CIR, Thermal, Hyperspectral composites, Lidar.

Services:

- Data acquisition services
  - Depending on project size and needs, we can acquire data using an UAV, aircraft or satellite to deliver high-resolution imagery, thermal, hyperspectral lidar or radar data
- Data processing services
  - Orthorectification, georeferencing, mosaicking, tonal balancing, tiling and other imagery related processing
  - DSM, DTM generation from stereo imagery or lidar
  - Vectorization (2D, 3D)
  - Data visualization: Thermal and hyperspectral data, 3D models and many more
- Analytical services
  - Classification of lidar and hyperspectral data
  - Change detection: Illegal construction, deforestation, fire and flood damage, vegetation health
  - Risk assessment: Identification of potentially dangerous vegetation for powerlines and other infrastructure
- Consultation services
  - PHOTOMAP provides consultation services in the Earth observation field to various clients and other EARSC members (CybELE)

References:

[1] https://www.photomap.sk/referencie.html

Data used:

Satellite data:
WorldView-1/2/3/4, GeoEye-1, Pleiades, SPOT 4/5/6/7, QuickBird, Ikonos, Sentinel-1/2/3, Landsat 5/7/8, TrippleSat, KazEOSat -1/2, TerraSAR-X

Airborne data:
Multispectral – UltraCam Eagle Mark 3, UltraCam XP, UltraCam LP, PhaseOne (RGB+NIR), Lidar – Riegel VQ780 I, Leica ALS70, Hyperspectral – AISA Kestrel 10, Thermal - DigiTHERM

UAV data:
Multispectral – LEICA RCD30, Lidar – GL-70, Hyperspectral – AISA Kestrel 10, Thermal – DigiTHERM

1. Land

c. Land Use & Land Cover

Company profile: EO service provider

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Cecile Tondriaux
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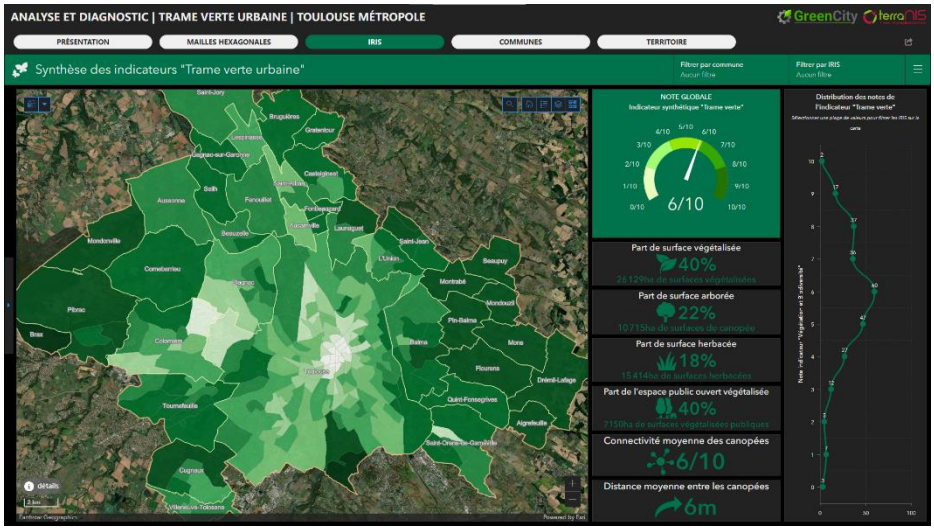
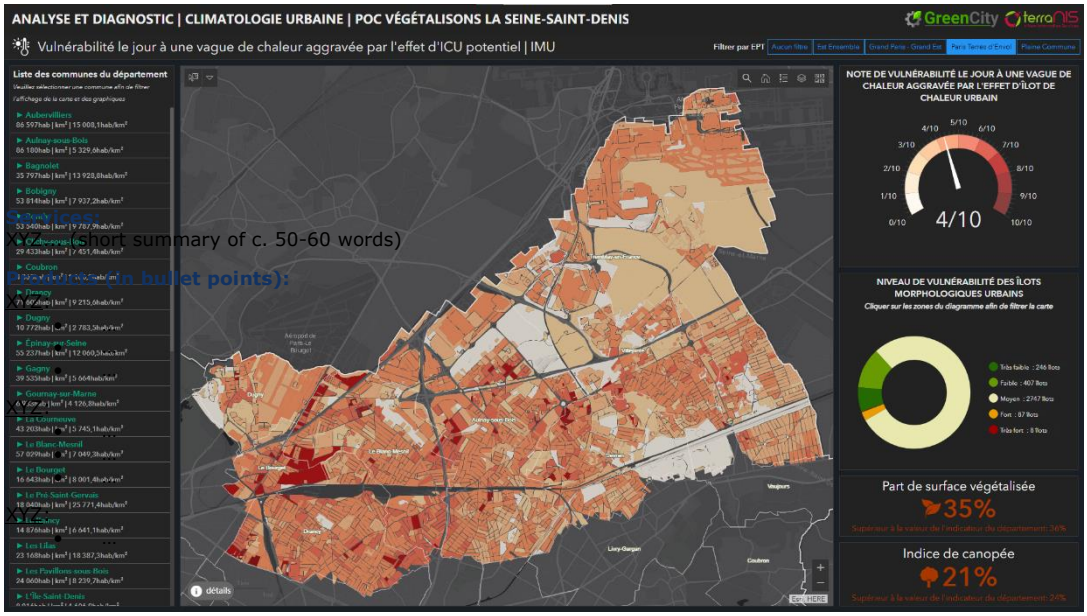
Company description:

TerraNIS is a company, created in 2014 and specialized in the development and delivery of EO based services applied to Agriculture, Viticulture and Environment.
Based in Toulouse, the company employs about 20 high skilled staff in Image processing, data analytics, agronomy and environment.
The services proposed by TerraNIS include Oenoview for Viticulture, Pixagri Neo for Agro-Ecology, and Terramap/ GreenCity for environment monitoring and land management.



Monitoring of the vegetation in urban environment

Identification of the Local Climate Zones in semi -urban areas, and assessment of vulnerability



References:
https://www.terranis.f
]https://greencitylab.terranis.fr/greencity_demo/

Data used:
Satellite data:Sentinel 2, Spot6/7, Pleiades
Airborne data: …
Drone data: …
Ground data:INSEE,

Company profile

Address
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CS 10413
67412 Illkirch Graffenstaden
FRANCE

Contact Person
Henri GIRAUD
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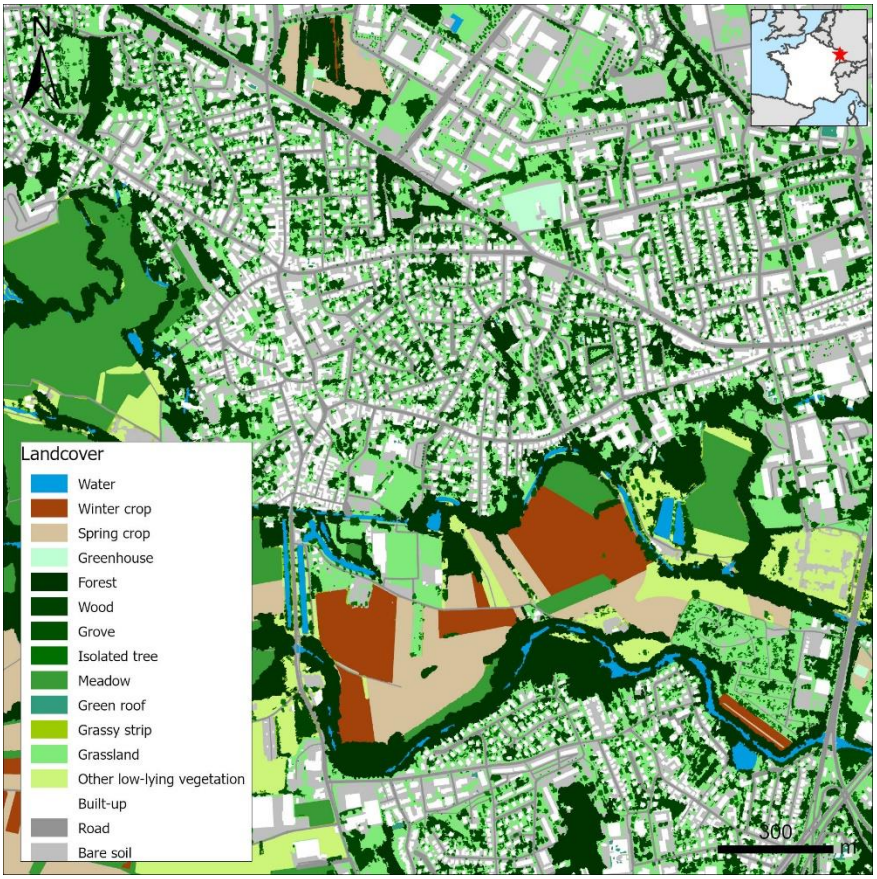
Company description:

For more than 30 years, ICube-SERTIT is a pioneer in exploiting satellite data to derive information that has high societal impact. In a world marked by climate change, natural disasters, environmental degradation and constant pressure on resources, ICube-SERTIT delivers a wide range of services to its customers: public services, international institutions, private sector, including the insurance sector.
Using satellite and aerial imagery, ICube-SERTIT designs products that meet societal needs in various domains (emergency mapping, risk and reconstruction, water & forest management, land use & urban planning…) using cutting edge technology and methods including Machine Learning and AI, while combining Earth Observation (EO) derived layers with increasingly abundant ancillary geo-spatial data to provide services tailored to client requests.



Services:
ICube-SERTIT is able to perform green infrastructure mapping derived from high and/or very high resolution satellite imagery, resulting in a key element of more generic landuse/landcover classification layers, particularly in urban areas where users (local / regional authorities, land planners) use such results to gain in quality and efficiency for the implementation of procedures, the evaluation of public policies or simply to take decisions based on objective data.

Products (in bullet points):
Landuse / landcover mapping:
- Spring / winter crops classification
- High / low-lying vegetation differentiation
- Separation between high / low-lying vegetation classes according to size, shape and proximity criteria

Ecological indicators:
- Green infrastructure continuity / density
- Necessary to identify biodiversity reservoirs and preserve habitats
- Useful for land planning purposes

References:
[1] https://sertit.unistra.fr/en/wp-content/themes/sertitheme/assets/prestations-assets/prestations/pdf/en/06_ICube-SERTIT_Portfolio_2021_EN_LandUse.pdf

Data used:
Satellite data: High / Very high spatial resolution optical imagery (Sentinel-2, SPOT 6-7, Pléiades...)
Ancillary data: Digital Surface / Terrain Model
Ground data: GIS layers (other landcover classes)

Company profile

Address
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6020 Innsbruck
Austria

Contact Person
Andreas Walli
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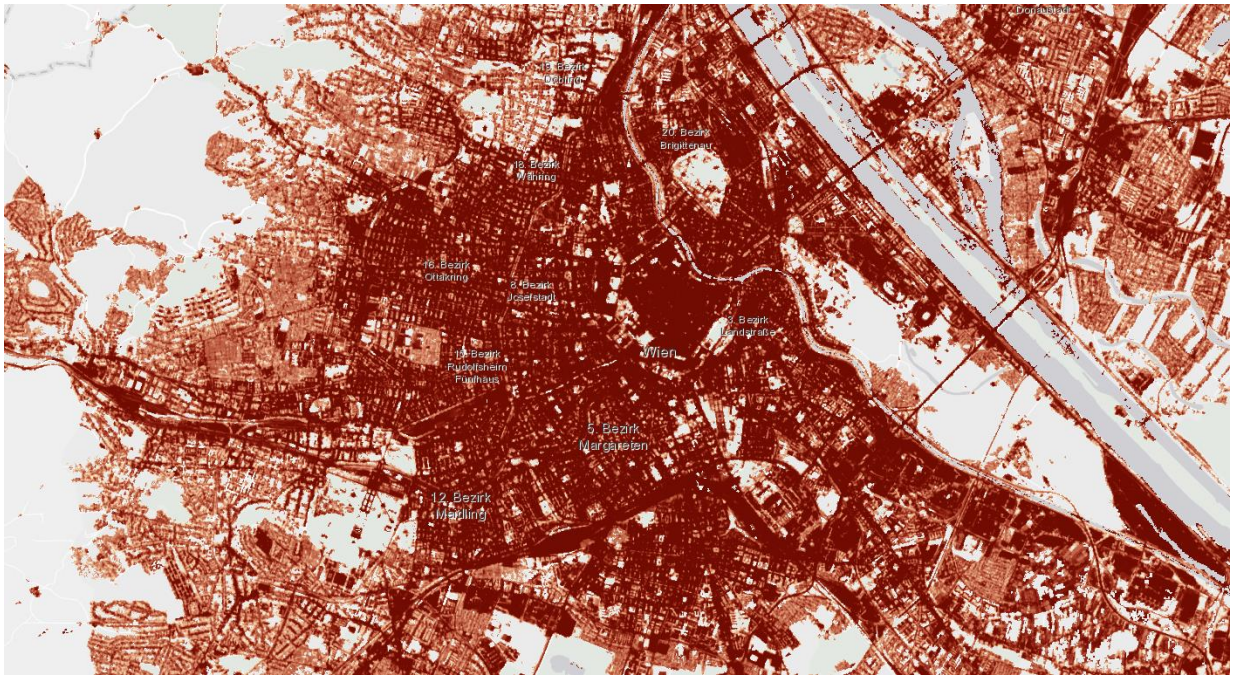
+43 512 562021

Company description:

GeoVille (http://www.geoville.com) is an internationally operating company, providing consultancy, services and products related to remote sensing, geo-information and geographic information systems and has longstanding experience in the field of environmental monitoring, focusing on the development of a multi-scale and multi-purpose land monitoring system.
GeoVille's focus is on the integration of satellite earth observation-based information and in-situ data to provide assessment and monitoring services. We enable geographic accounting of human and natural dynamics through a satellite's eye, adding the spatial dimension to information gathering, analysis and monitoring, for policy support and informed decision making.



Services:
Planning support for adaptation solutions to amplified heat stress in cities due to global warming and the Urban Heat Island effect. With regard to climate change monitoring and Green Deal Reporting Obligations the services support the Sustainable Development Goal Reporting SDG Target 11.7 and Target 15.3

Products (in bullet points):
Land Cover/Use maps:

- Built-up area extent and change (incl. vegetated patches)
- Sealed/impermeable surface extent and change, as per-pixel estimate of impermeable cover of soil (0-100%).
- 10m, 20m and 100m spatial resolution.

Derived indicators:

- Greyness per pixel
- Grey infrastructure on neighborhood level
- Distance to cool spaces (and other points of interest, e.g. hospitals)
- Population density, proportion of vulnerable population groups (e.g. elderly people)

References:
[1] https://www.geoville.com/products/dynamic-monitoring-services/
[2] https://land.copernicus.eu/pan-european/high-resolution-layers/imperviousness

Data used:
Satellite data: High-resolution optical / SAR satellite imagery, including ESA's Sentinel-1 and Sentinel-2 satellites
Airborne data: Very high resolution orthophotos (or satellite imagery) for calibration of imperviousness degree
Drone data: none
Ground data: for derived indicators (population statistics, Points of Interest)

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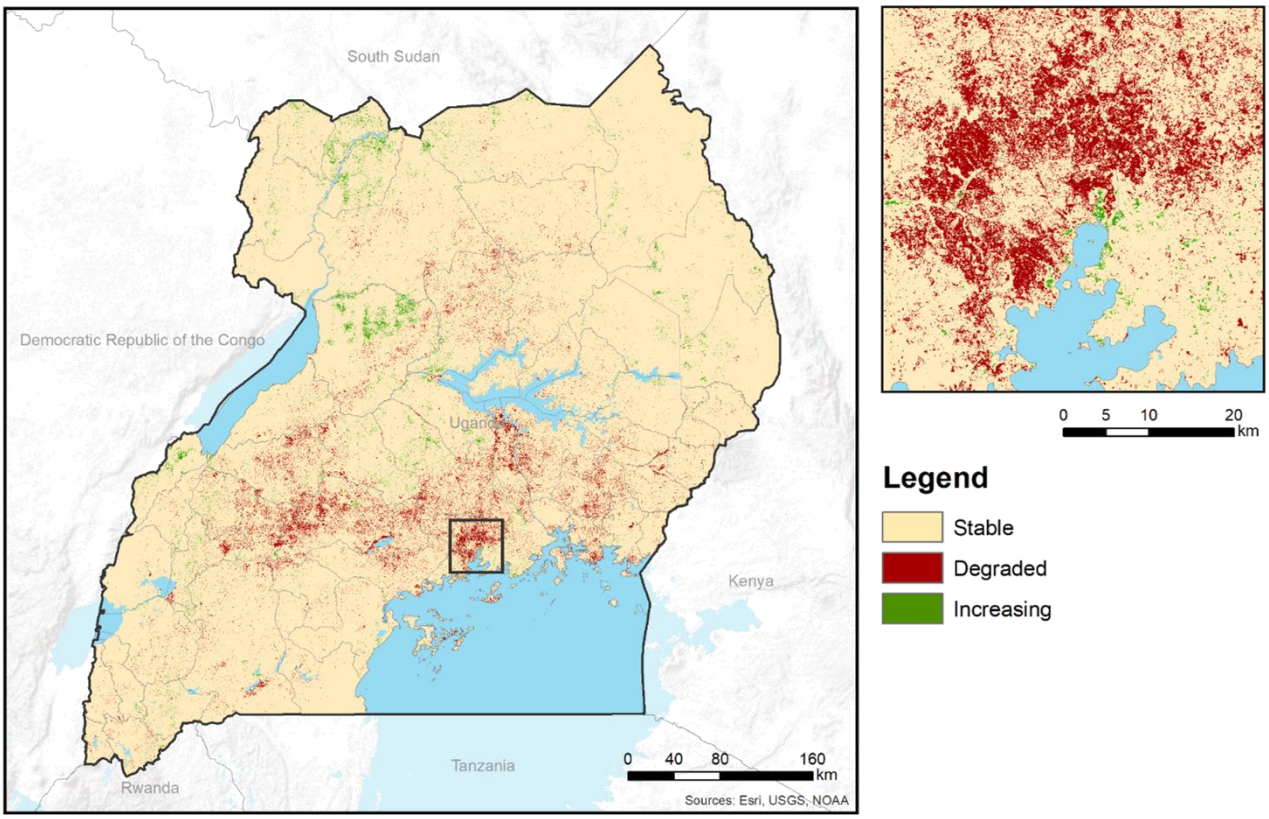

Services:
The service aims at measuring and monitoring land degradation by calculating the ratio between the degraded land area and the total land area of a country. With regard to climate change monitoring and Green Deal Reporting Obligations the services support the Sustainable Development Goal Reporting SDG Target 15.3

Products (in bullet points):
Land Cover:

- Changes in distribution of vegetation types, and human-impacted infrastructure, reflecting the use of land resources (i.e., soil, water and biodiversity) for agriculture, forestry, human settlements and other purposes
- Spatial resolution reaching from VHR to HR

Land Productivity:

- Total above-ground net primary production (NPP) defined as the energy fixated by plants minus their respiration which translates into the rate of biomass accumulation that delivers ecosystem services
- Spatial resolution reaching from VHR to HR

References:
[1] https://www.geoville.com
[2] https://www.esa-landcover-cci.org/
[3] https://land.copernicus.eu/global/products/lc
[4] http://publications.jrc.ec.europa.eu/repository/handle/JRC80541
[5] http://www.fao.org/soils-portal/soil-survey/soil-maps-and-databases/harmonized-world-soil-database-v12/en/

Data used:
Satellite data: Sentinel-2, Landsat, Sentinel-3, MODIS, MERIS, VIIRS, SPOT Vegetation, PROBA-V, Commercial satellites
Supporting data: Global datasets (e.g. CCI, Copernicus Dynamic Land Cover, JRC's Land Productivity Dynamics (LPD) dataset, Copernicus Global Land Service products, Harmonized World Soil Database (HWSD), etc.

1. Land

d. Topography & Motion

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Branch : Theophilopoulou 13, GR 11743 Athens
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mail@geosystems-hellas.gr
www.geosystems-hellas.gr

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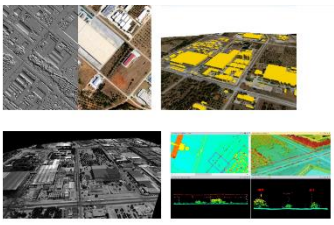

(Maltezos, E., Charalampopoulou, B. 2018. European Association of Remote Sensing Companies (EARSC) http://eomag.eu/articles/4270/airborne-lidar-remote-sensing-techniques-for-monitor-3d-industrial-cities),

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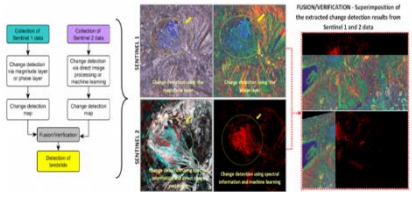

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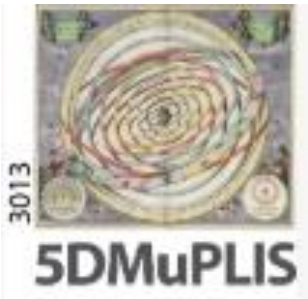
(Maltezos, E., Skitsas, M., Charalambous, E., Koutras, N., Bliziotis, D., Themistocleous, K., 2016. Critical infrastructure monitoring using UAV imagery. SPIE Proceedings, Volume 9688, Maltezos, E., Charalampopoulou, V., 2016. Reconstruction of Urban Scenes using the IMAGINE UAV/ERDAS IMAGINE TOOL. 5th International Workshop on 3D Cadastres)

- ✓ Application 5DMUPLIS: 5D Multi-Purpose LIS (Land information System), for integrating and managing various types of information (financial, architectural, topographical, cadastral, valuation, engineering, ownership, etc.) from governmental, regional and local databases at 3d spatial dimensions x, y, z + time + scale (Data use from VHR RS data and/or airphotos true ortho, LiDAR with LODs and other auxiliary) *(http://www.5dmuplis.gr/en/)*



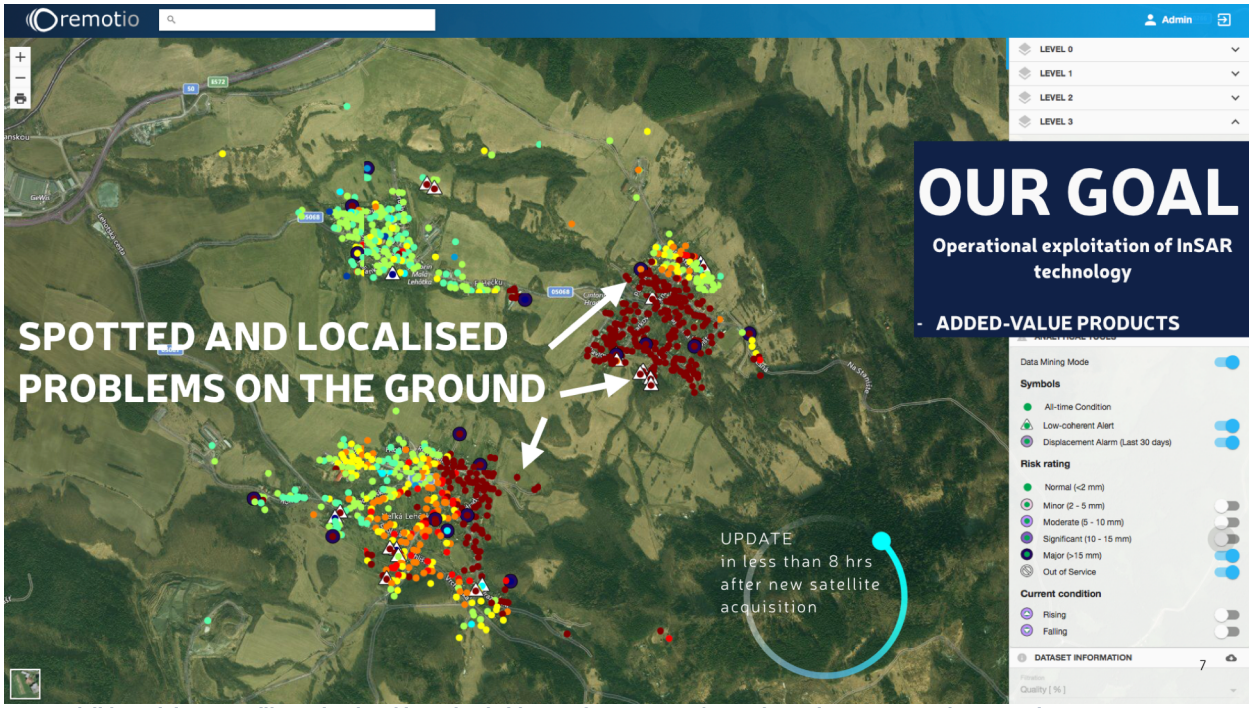
insar.sk
Company's profile

insar.sk s.r.o.
Lesna 35, 080 01, Presov
Slovakia
EU ID: 48 126 560
TAX ID: SK 212 006 9446
https://insar.space
https://remotio.space

Contact Person:
Ing. Matus Bakon, PhD.
+421/905 356 714
matusbakon@insar.sk

Company's description:

insar.sk Limited liability company is a provider of geodetic and remote sensing analysis with focus on the deformation monitoring via satellite radar interferometry (InSAR, Interferometric Synthetic Aperture Radar). The primary aim of the company is the deformation monitoring of structures and infrastructures (buildings, industrial zones, cultural heritage structures, roads, bridges, highways), urban areas, undermined and landsliding areas, deposits of mineral resources and objects of the strategic importance (dams, waterworks, powerplants, airport facilities). The company focuses on the development of autonomous procedures designed to detect outlying measurements and facilitating the automatic interpretation of higher-order products such as ground deformation maps.



Landslide activity over villages in Slovakia and subsidence of up to -3 cm/year shown in remotIO web-app environment

Services:
remotIO-X provides 24/7 infrastructure stability monitoring and ensures immediate awareness during complex deformation processes like landslides or structural collapses. remotIO-X monitors millimetric changes of man-made objects from Space. These are analyzed to identify potentially hazardous zones by pinpointing anomalous behavior. remotIO-X provides easy web-access to early warning and higher-level InSAR products which are updated several hours after new satellite acquisition is made.

remotIO-X's unique data-mining algorithm is based on the satellite radar interferometry (InSAR) technology exploiting regular acquisitions of Sentinel-1 and TerraSAR-X.

remotIO-X may reduce operating costs for monitoring structures, providing a more detailed and frequent surveillance which shall result in better safety conditions. Results are easier to interpret and faster to communicate with non-expert customers in the need for rapid response.

References:
[1] https://remotio.space
[2] https://insar.space/projects
[3] https://ieeexplore.ieee.org/document/7895168/
[4] https://copernicus-masters.com/winner/remotio-x-retrieval-of-motion-and-potential-deformation-threats/

Data used:
Sentinel-1 + any other SAR satellites (TerraSAR-X, Cosmo-SkyMed, etc.)

1. Land

e. Inland Water

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3811 HN Amersfoort
The Netherlands
https://www.neo.nl

Contact Person:
Steven Braakman
+31 (0)33 2100700
steven.braakman@neo.nl

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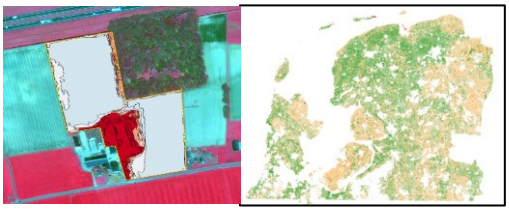

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2. Built Environment

a. Transport Networks

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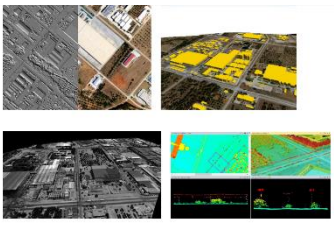

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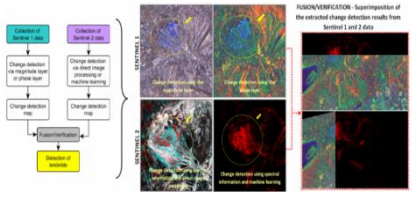

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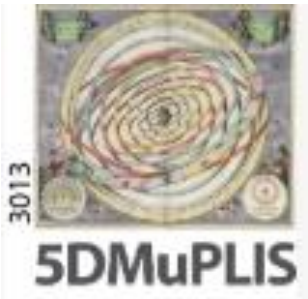

insar.sk
Company's profile

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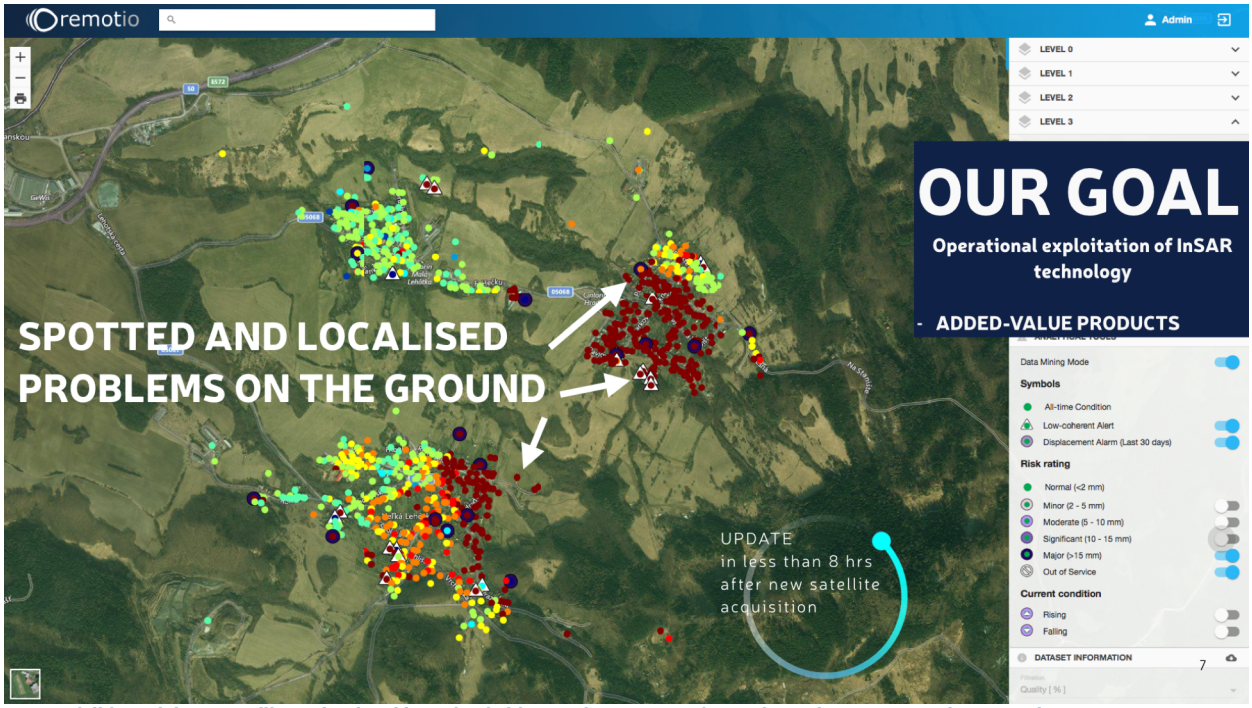
Lesna 35, 080 01, Presov
Slovakia
EU ID: 48 126 560
TAX ID: SK 212 006 9446
https://insar.space
https://remotio.space

Contact Person:
Ing. Matus Bakon, PhD.
+421/905 356 714
matusbakon@insar.sk

Company's description:

insar.sk Limited liability company is a provider of geodetic and remote sensing analysis with focus on the deformation monitoring via satellite radar interferometry (InSAR, Interferometric Synthetic Aperture Radar). The primary aim of the company is the deformation monitoring of structures and infrastructures (buildings, industrial zones, cultural heritage structures, roads, bridges, highways), urban areas, undermined and landsliding areas, deposits of mineral resources and objects of the strategic importance (dams, waterworks, powerplants, airport facilities). The company focuses on the development of autonomous procedures designed to detect outlying measurements and facilitating the automatic interpretation of higher-order products such as ground deformation maps.



Landslide activity over villages in Slovakia and subsidence of up to -3 cm/year shown in remotIO web-app environment

Services:
remotIO-X provides 24/7 infrastructure stability monitoring and ensures immediate awareness during complex deformation processes like landslides or structural collapses. remotIO-X monitors millimetric changes of man-made objects from Space. These are analyzed to identify potentially hazardous zones by pinpointing anomalous behavior. remotIO-X provides easy web-access to early warning and higher-level InSAR products which are updated several hours after new satellite acquisition is made.

remotIO-X's unique data-mining algorithm is based on the satellite radar interferometry (InSAR) technology exploiting regular acquisitions of Sentinel-1 and TerraSAR-X.

remotIO-X may reduce operating costs for monitoring structures, providing a more detailed and frequent surveillance which shall result in better safety conditions. Results are easier to interpret and faster to communicate with non-expert customers in the need for rapid response.

References:
[1] https://remotio.space
[2] https://insar.space/projects
[3] https://ieeexplore.ieee.org/document/7895168/
[4] https://copernicus-masters.com/winner/remotio-x-retrieval-of-motion-and-potential-deformation-threats/

Data used:
Sentinel-1 + any other SAR satellites (TerraSAR-X, Cosmo-SkyMed, etc.)

NEO B.V.
Stadsring 65 D
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The Netherlands
https://www.neo.nl

Contact Person:
Steven Braakman
+31 (0)33 2100700
steven.braakman@neo.nl

Company's description:

NEO is a Dutch international earth observation service provider, celebrating its 24th anniversary. We provide services that create value by sensing the dynamics of our habitat. NEO serves over 200 customers, located both in the Netherlands and globally. With its 30 Geo- and EO-specialists in 2019 the company is independent from all providers of imagery, software and other organizations.

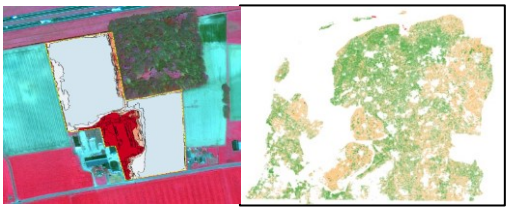
NEO is a leader in the monitoring and the change detection of geo-objects, such as forests and trees, agricultural parcels, nature reserves, but also of buildings, infrastructure, roads and water courses, etc. NEO's mission is to support organizations in keeping track of the dynamics of and on our planet. Our information helps our customers to reduce costs, increase safety, prevent errors, to comply with regulations and to manage our environment better. That is how we have impact on both industry and society.

NEO concentrates on solving technological and process challenges in monitoring of geo-objects using earth observation tools. The complex process to secure and update information from images has been mastered in SignalEyes®, NEO's certified work process (ISO9001 Quality Management and ISO27001 Information Security).

Change signalling services

Our change signalling services make use of state-of-the–art automated image classification algorithms based on artificial intelligence, so as to be able to process the ever increasing data volume. This allows for data driven processes and decision making for our clients. We deliver near real-time information as a service, in the form of **call-to-actions** for our clients. Some examples of NEO's services are given below.

Agricultural monitoring
Service to monitor agricultural activities and precision agriculture, such as harvesting, heterogeneity. Additionally: control with remote sensing supporting common agricultural policy regulations and automated change detection of LPIS registry geometries. In The Netherlands on behalf of the Paying Agency of the Ministry of Agriculture, also in Denmark and Sweden.



Tree monitoring
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Monitoring waterways
Waterways are monitored to reveal changes in geometry (new ditches, filled waterways, water quality, (floating) vegetation. Both policy makers and maintenance of waterways is supported.

Solar Panel monitoring
The service contains detailed information on locations of solar panels and properties (inclination, azimuth, peak power). The monitoring of solar panels is performed using aerial imagery and satellite imagery. Sustainability goals are monitored.

Imperviousness monitor
The imperviousness product monitors imperviousness and permeability of the surface. It allows for reliable analyses and supports policy and planning processes.

2. Built Environment
b. Infrastructure

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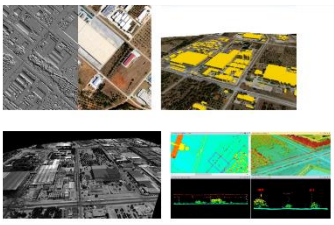
Tel.: +30 210 28 46 144 - 145
mail@geosystems-hellas.gr
www.geosystems-hellas.gr

Company's description:

GEOSYSTEMS HELLAS (GSH) is acting commercially as an authorized reseller for Hexagon Geospatial and Hexagon Airborne solutions, and as a consultant in Greece and Cyprus. GSH is working on commercial Environmental, Photogrammetrical, Remote Sensing projects and R&D projects for land management, crisis management and Spatial Data Infrastructure (INSPIRE Directive) implementations. GSH] is a pioneer in introducing Information Technology using extensively modern, digital geodata capturing and data processing techniques for production of maps and geographic information systems. GSH is deeply involved in Big Data and Data Fusion and Data Analytics techniques for National projects and establishment of infrastructure for spatial information (Metadata, Data Specifications, Data and Service Sharing and Monitoring and Reporting). [GSH] holds extensive expertise in regards to operational requirements/scenarios definition in fields of data exchange/sharing in an interoperability manner.

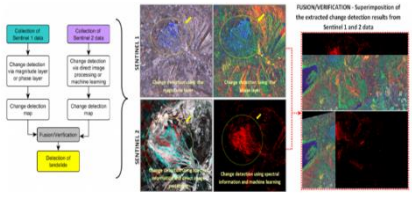
Services:

- ✓ Creation of 3D modern cartographic backgrounds for smart and safe management of industrial areas using a multi-modal data fusion approach (LIDAR and aerial RGB imagery) _ERDAS IMAGINE



(Maltezos, E., Charalampopoulou, B. 2018. European Association of Remote Sensing Companies (EARSC) http://eomag.eu/articles/4270/airborne-lidar-remote-sensing-techniques-for-monitor-3d-industrial-cities),

- ✓ Change detection maps using satellite data and ML techniques (Sentinel 1, 2 and any other satellites) _ ERDAS IMAGINE



(http://eomag.eu/articles/4157/landslide-detection-using-sentinels-monitoring-the-june-2017-disaster-event-in-amyntaio-mine)

- ✓ Critical infrastructure monitoring using UAV imagery_ ERDAS IMAGINE/UAV

(Maltezos, E., Skitsas, M., Charalambous, E., Koutras, N., Bliziotis, D., Themistocleous, K., 2016. Critical infrastructure monitoring using UAV imagery. SPIE Proceedings, Volume 9688, Maltezos, E., Charalampopoulou, V., 2016. Reconstruction of Urban Scenes using the IMAGINE UAV/ERDAS IMAGINE TOOL. 5th International Workshop on 3D Cadastres)

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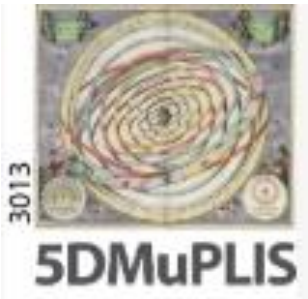

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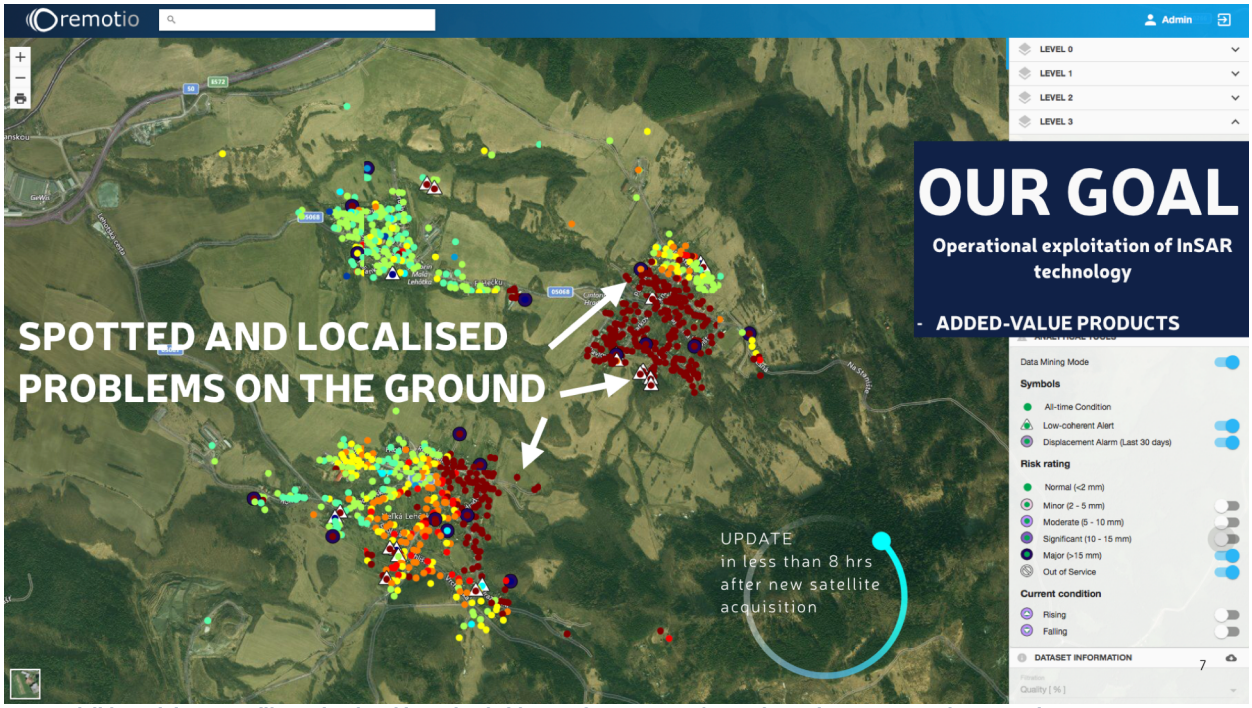

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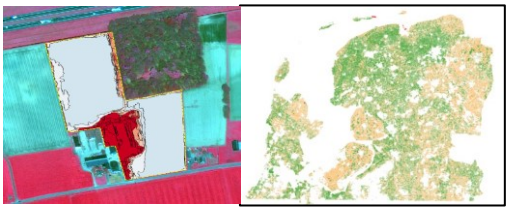

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PHOTOMAP

Company profile

PHOTOMAP s.r.o
Poludníková 3/1453
040 12 Košice
Slovakia
TAX ID: SK2021736145
https://www.photomap.sk

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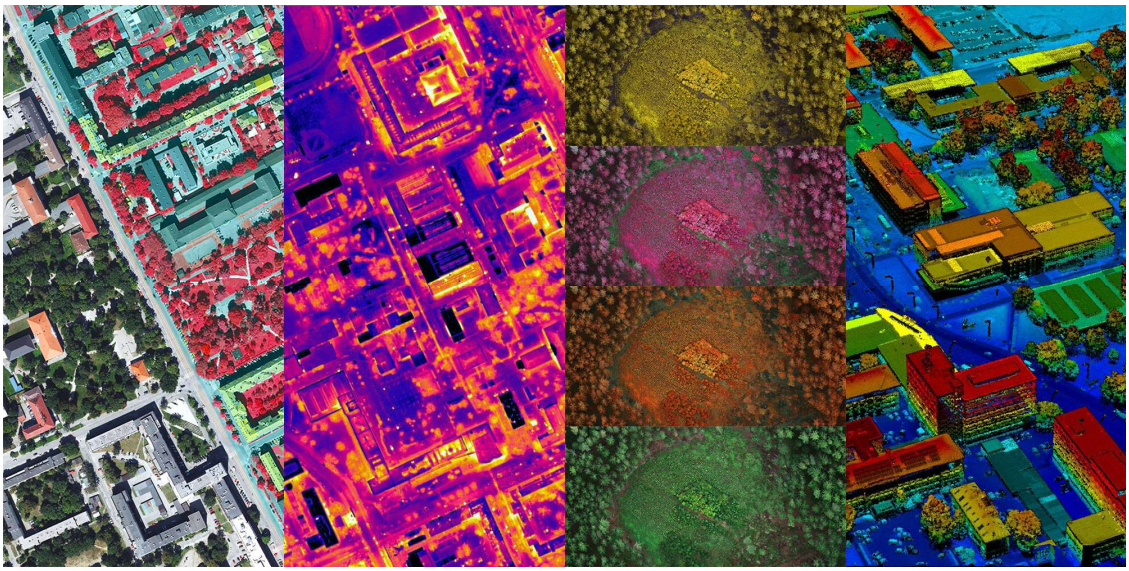
Company's description:

PHOTOMAP is a Slovak remote sensing company that specializes in geospatial data acquisition, processing, and analysis. Our key strength lies in the long unrivalled experience dated since 2003 in using a variety of platforms and sensors. We operate several UAVs, aircrafts and cooperate with satellite data providers in order to deliver the most suitable and accurate products for your project needs. With our ability to deliver multispectral, thermal, hyperspectral, lidar and radar data products and analysis, we can satisfy even the most demanding clients.



Several product examples: RGB/CIR, Thermal, Hyperspectral composites, Lidar.

Services:

- Data acquisition services
  - Depending on project size and needs, we can acquire data using an UAV, aircraft or satellite to deliver high-resolution imagery, thermal, hyperspectral lidar or radar data
- Data processing services
  - Orthorectification, georeferencing, mosaicking, tonal balancing, tiling and other imagery related processing
  - DSM, DTM generation from stereo imagery or lidar
  - Vectorization (2D, 3D)
  - Data visualization: Thermal and hyperspectral data, 3D models and many more
- Analytical services
  - Classification of lidar and hyperspectral data
  - Change detection: Illegal construction, deforestation, fire and flood damage, vegetation health
  - Risk assessment: Identification of potentially dangerous vegetation for powerlines and other infrastructure
- Consultation services
  - PHOTOMAP provides consultation services in the Earth observation field to various clients and other EARSC members (CybELE)

References:

[1] https://www.photomap.sk/referencie.html

Data used:

Satellite data:
WorldView-1/2/3/4, GeoEye-1, Pleiades, SPOT 4/5/6/7, QuickBird, Ikonos, Sentinel-1/2/3, Landsat 5/7/8, TrippleSat, KazEOSat -1/2, TerraSAR-X

Airborne data:
Multispectral – UltraCam Eagle Mark 3, UltraCam XP, UltraCam LP, PhaseOne (RGB+NIR), Lidar – Riegel VQ780 I, Leica ALS70, Hyperspectral – AISA Kestrel 10, Thermal - DigiTHERM

UAV data:
Multispectral – LEICA RCD30, Lidar – GL-70, Hyperspectral – AISA Kestrel 10, Thermal – DigiTHERM

2. Built Environment

c. Urban Areas

Company profile: EO service provider

Address
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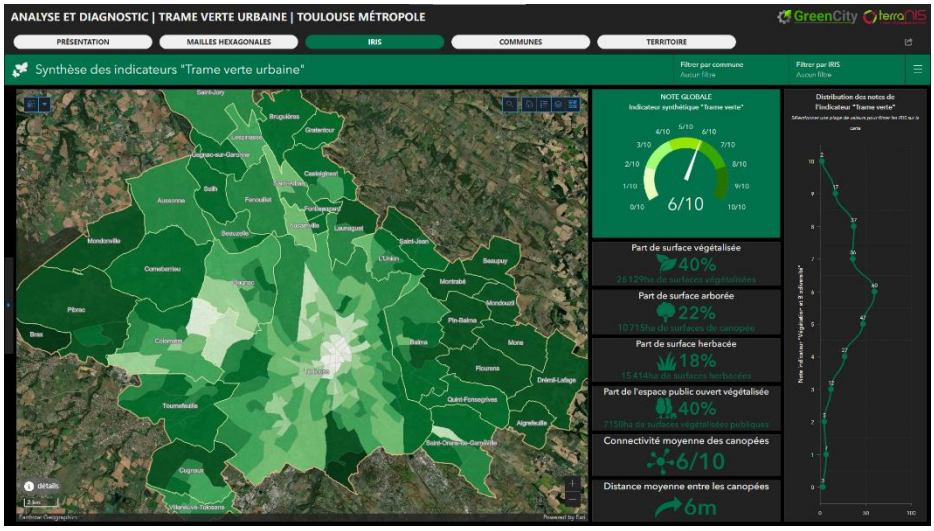
Contact Person
Clement Murgue
Clement.murgue@terranis.fr
Cecile Tondriaux
cecile.tondriaux@terranis.fr

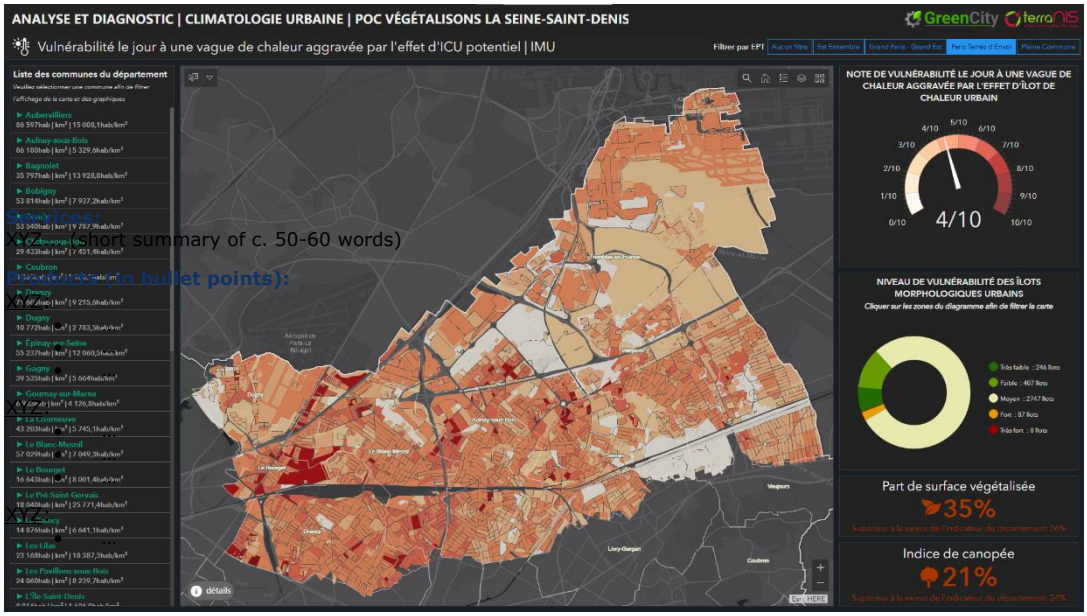
Company description:

TerraNIS is a company, created in 2014 and specialized in the development and delivery of EO based services applied to Agriculture, Viticulture and Environment.
Based in Toulouse, the company employs about 20 high skilled staff in Image processing, data analytics, agronomy and environment.
The services proposed by TerraNIS include Oenoview for Viticulture, Pixagri Neo for Agro-Ecology, and Terramap/ GreenCity for environment monitoring and land management.



Monitoring of the vegetation in urban environment

Identification of the Local Climate Zones in semi -urban areas, and assessment of vulnerability



References:
https://www.terranis.f
]https://greencitylab.terranis.fr/greencity_demo/

Data used:
Satellite data:Sentinel 2, Spot6/7, Pleiades
Airborne data: …
Drone data: …
Ground data:INSEE,

eoanalytics
Aerial Mapping & Remote Sensing
www.eoanalytics.ie

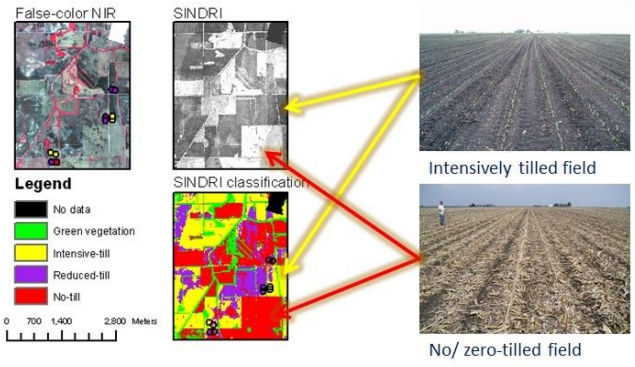
Dr. Guy Serbin, CEO
Talent Garden Dublin, Glasnevin, Dublin 11, D11 YNR2, Ireland
guy@eoanalytics.ie +353-89-2076764

EOanalytics is a Dublin-based Earth observation (EO) startup, incorporated in November 2018. We support operational, research and development, educational, and consulting activities. Our primary area of interests are:

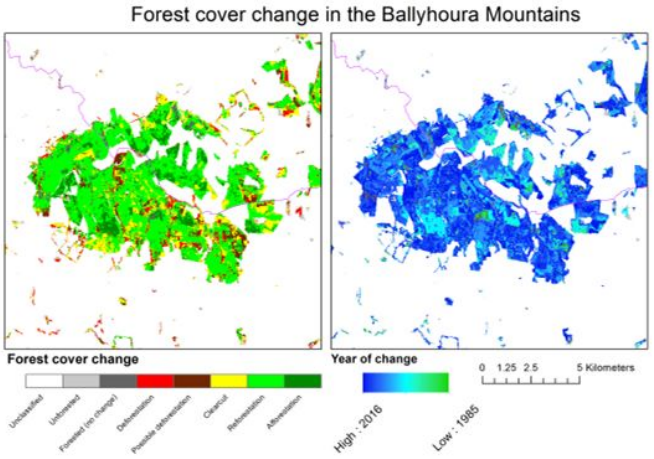
- Agricultural and environmental applications, including crop production, area, and yield (PAY) estimation, tillage intensity monitoring, fire fuel monitoring, and land cover land use change detection.
- Geospatial big data management and delivery for spatiotemporal analyses.
- Improved satellite and airborne EO sensors.
- Machine learning and edge processing of EO data for real time mapping and monitoring.

Our staff have used multi- and hyperspectral remote sensing data at different scales (satellite, airborne, UAV, and photospectrometry) for a number of applications:

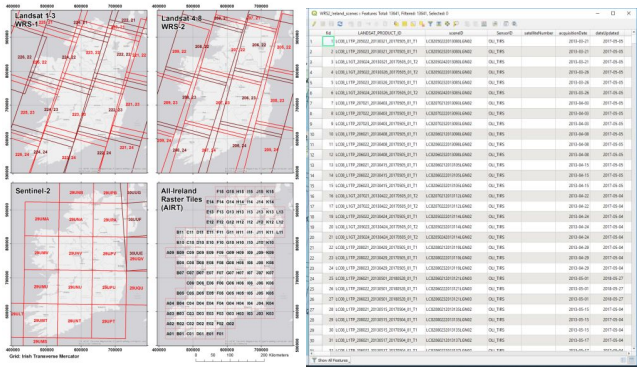
Serbin et al., 2009. 'An Improved ASTER Index for Remote Sensing of Crop Residue', *Remote Sensing*, 1(4), 971-991.



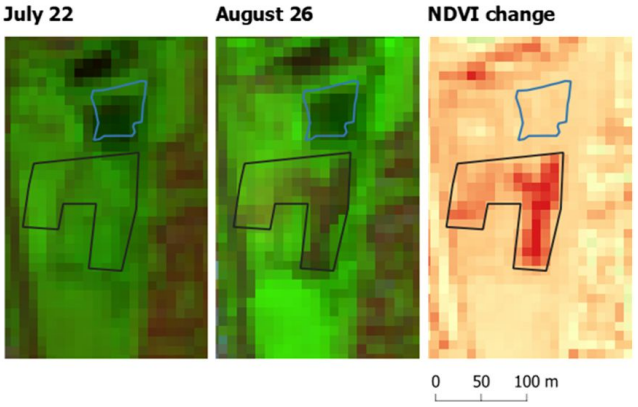
The Ireland Forest Disturbance from Earth Observation (IForDEO) Python module (code release pending peer-reviewed publication)



The Irish Earth Observation (IEO) Python satellite data management module



Urban habitat destruction in Sean Walsh Memorial Park from Sentinel-2, Tallaght, Ireland, 2019



Company profile

Address
Sparkassenplatz 2
6020 Innsbruck
Austria

Contact Person
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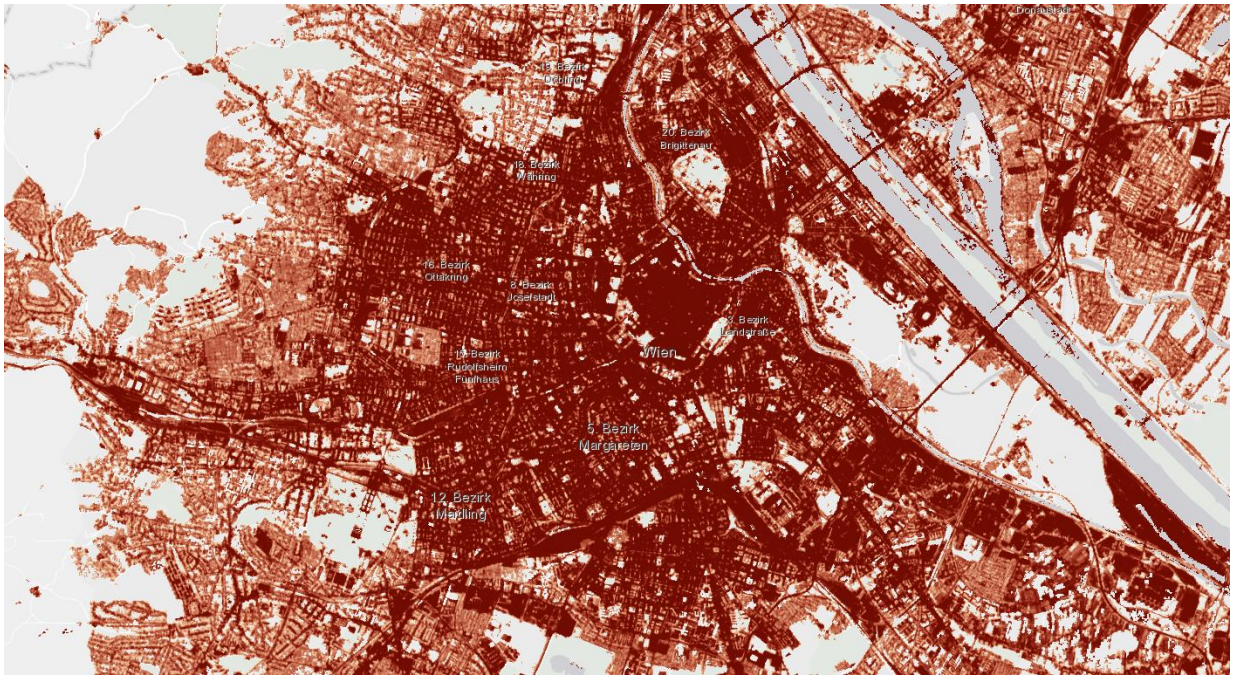
walli@geoville.com
+43 512 562021

Company description:

GeoVille (http://www.geoville.com) is an internationally operating company, providing consultancy, services and products related to remote sensing, geo-information and geographic information systems and has longstanding experience in the field of environmental monitoring, focusing on the development of a multi-scale and multi-purpose land monitoring system.
GeoVille's focus is on the integration of satellite earth observation-based information and in-situ data to provide assessment and monitoring services. We enable geographic accounting of human and natural dynamics through a satellite's eye, adding the spatial dimension to information gathering, analysis and monitoring, for policy support and informed decision making.



Services:
Planning support for adaptation solutions to amplified heat stress in cities due to global warming and the Urban Heat Island effect. With regard to climate change monitoring and Green Deal Reporting Obligations the services support the Sustainable Development Goal Reporting SDG Target 11.7 and Target 15.3

Products (in bullet points):
Land Cover/Use maps:

- Built-up area extent and change (incl. vegetated patches)
- Sealed/impermeable surface extent and change, as per-pixel estimate of impermeable cover of soil (0-100%).
- 10m, 20m and 100m spatial resolution.

Derived indicators:

- Greyness per pixel
- Grey infrastructure on neighborhood level
- Distance to cool spaces (and other points of interest, e.g. hospitals)
- Population density, proportion of vulnerable population groups (e.g. elderly people)

References:
[1] https://www.geoville.com/products/dynamic-monitoring-services/
[2] https://land.copernicus.eu/pan-european/high-resolution-layers/imperviousness

Data used:
Satellite data: High-resolution optical / SAR satellite imagery, including ESA's Sentinel-1 and Sentinel-2 satellites
Airborne data: Very high resolution orthophotos (or satellite imagery) for calibration of imperviousness degree
Drone data: none
Ground data: for derived indicators (population statistics, Points of Interest)

Company profile

Address
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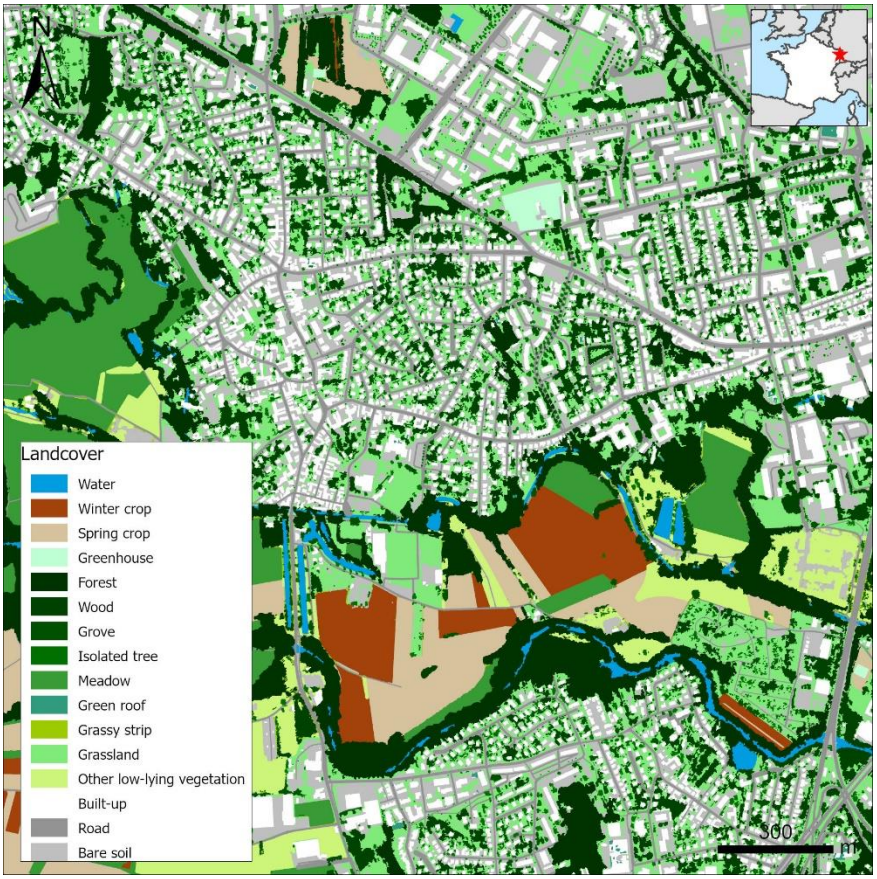
+33 (0)3 68 85 46 44

Company description:

For more than 30 years, ICube-SERTIT is a pioneer in exploiting satellite data to derive information that has high societal impact. In a world marked by climate change, natural disasters, environmental degradation and constant pressure on resources, ICube-SERTIT delivers a wide range of services to its customers: public services, international institutions, private sector, including the insurance sector.
Using satellite and aerial imagery, ICube-SERTIT designs products that meet societal needs in various domains (emergency mapping, risk and reconstruction, water & forest management, land use & urban planning…) using cutting edge technology and methods including Machine Learning and AI, while combining Earth Observation (EO) derived layers with increasingly abundant ancillary geo-spatial data to provide services tailored to client requests.



Services:
ICube-SERTIT is able to perform green infrastructure mapping derived from high and/or very high resolution satellite imagery, resulting in a key element of more generic landuse/landcover classification layers, particularly in urban areas where users (local / regional authorities, land planners) use such results to gain in quality and efficiency for the implementation of procedures, the evaluation of public policies or simply to take decisions based on objective data.

Products (in bullet points):
Landuse / landcover mapping:
- Spring / winter crops classification
- High / low-lying vegetation differentiation
- Separation between high / low-lying vegetation classes according to size, shape and proximity criteria

Ecological indicators:
- Green infrastructure continuity / density
- Necessary to identify biodiversity reservoirs and preserve habitats
- Useful for land planning purposes

References:
[1] https://sertit.unistra.fr/en/wp-content/themes/sertitheme/assets/prestations-assets/prestations/pdf/en/06_ICube-SERTIT_Portfolio_2021_EN_LandUse.pdf

Data used:
Satellite data: High / Very high spatial resolution optical imagery (Sentinel-2, SPOT 6-7, Pléiades...)
Ancillary data: Digital Surface / Terrain Model
Ground data: GIS layers (other landcover classes)

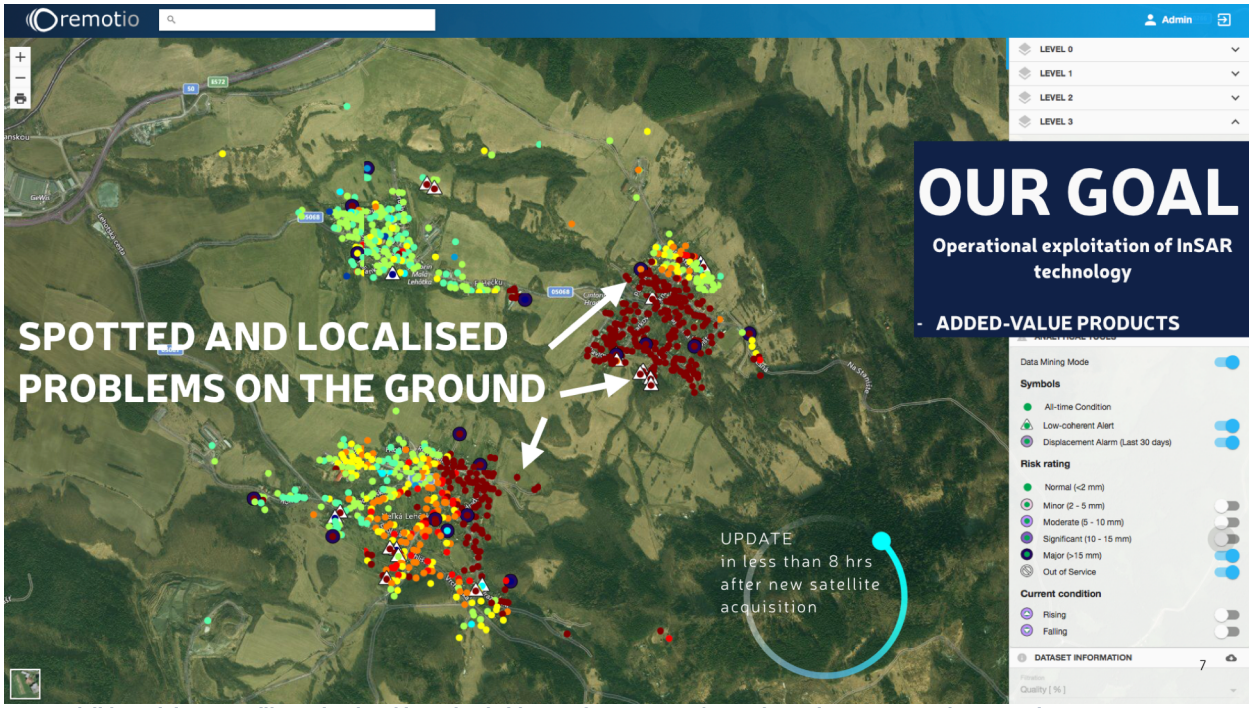
insar.sk
Company's profile

insar.sk s.r.o.
Lesna 35, 080 01, Presov
Slovakia
EU ID: 48 126 560
TAX ID: SK 212 006 9446
https://insar.space
https://remotio.space

Contact Person:
Ing. Matus Bakon, PhD.
+421/905 356 714
matusbakon@insar.sk

Company's description:

insar.sk Limited liability company is a provider of geodetic and remote sensing analysis with focus on the deformation monitoring via satellite radar interferometry (InSAR, Interferometric Synthetic Aperture Radar). The primary aim of the company is the deformation monitoring of structures and infrastructures (buildings, industrial zones, cultural heritage structures, roads, bridges, highways), urban areas, undermined and landsliding areas, deposits of mineral resources and objects of the strategic importance (dams, waterworks, powerplants, airport facilities). The company focuses on the development of autonomous procedures designed to detect outlying measurements and facilitating the automatic interpretation of higher-order products such as ground deformation maps.



Landslide activity over villages in Slovakia and subsidence of up to -3 cm/year shown in remotIO web-app environment

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remotIO-X may reduce operating costs for monitoring structures, providing a more detailed and frequent surveillance which shall result in better safety conditions. Results are easier to interpret and faster to communicate with non-expert customers in the need for rapid response.

References:
[1] https://remotio.space
[2] https://insar.space/projects
[3] https://ieeexplore.ieee.org/document/7895168/
[4] https://copernicus-masters.com/winner/remotio-x-retrieval-of-motion-and-potential-deformation-threats/

Data used:
Sentinel-1 + any other SAR satellites (TerraSAR-X, Cosmo-SkyMed, etc.)

NEO B.V.
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Steven Braakman
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Company's description:

NEO is a Dutch international earth observation service provider, celebrating its 24th anniversary. We provide services that create value by sensing the dynamics of our habitat. NEO serves over 200 customers, located both in the Netherlands and globally. With its 30 Geo- and EO-specialists in 2019 the company is independent from all providers of imagery, software and other organizations.

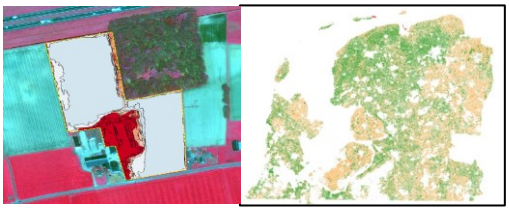
NEO is a leader in the monitoring and the change detection of geo-objects, such as forests and trees, agricultural parcels, nature reserves, but also of buildings, infrastructure, roads and water courses, etc. NEO's mission is to support organizations in keeping track of the dynamics of and on our planet. Our information helps our customers to reduce costs, increase safety, prevent errors, to comply with regulations and to manage our environment better. That is how we have impact on both industry and society.

NEO concentrates on solving technological and process challenges in monitoring of geo-objects using earth observation tools. The complex process to secure and update information from images has been mastered in SignalEyes®, NEO's certified work process (ISO9001 Quality Management and ISO27001 Information Security).

Change signalling services

Our change signalling services make use of state-of-the–art automated image classification algorithms based on artificial intelligence, so as to be able to process the ever increasing data volume. This allows for data driven processes and decision making for our clients. We deliver near real-time information as a service, in the form of **call-to-actions** for our clients. Some examples of NEO's services are given below.

Agricultural monitoring
Service to monitor agricultural activities and precision agriculture, such as harvesting, heterogeneity. Additionally: control with remote sensing supporting common agricultural policy regulations and automated change detection of LPIS registry geometries. In The Netherlands on behalf of the Paying Agency of the Ministry of Agriculture, also in Denmark and Sweden.



Tree monitoring
The Tree Register is a service providing information on all trees in the Netherlands (location, height) that supports clients in tree management and law enforcement tasks. Additionally sustainability of urban environments can be monitored.

Pipeline monitoring
Our pipeline monitoring services deliver near-real time information and calls-to-action that safeguard pipeline integrity and environmental safety. We help to reduce risks and costs.

Monitoring waterways
Waterways are monitored to reveal changes in geometry (new ditches, filled waterways, water quality, (floating) vegetation. Both policy makers and maintenance of waterways is supported.

Solar Panel monitoring
The service contains detailed information on locations of solar panels and properties (inclination, azimuth, peak power). The monitoring of solar panels is performed using aerial imagery and satellite imagery. Sustainability goals are monitored.

Imperviousness monitor
The imperviousness product monitors imperviousness and permeability of the surface. It allows for reliable analyses and supports policy and planning processes.

PHOTOMAP

Company profile

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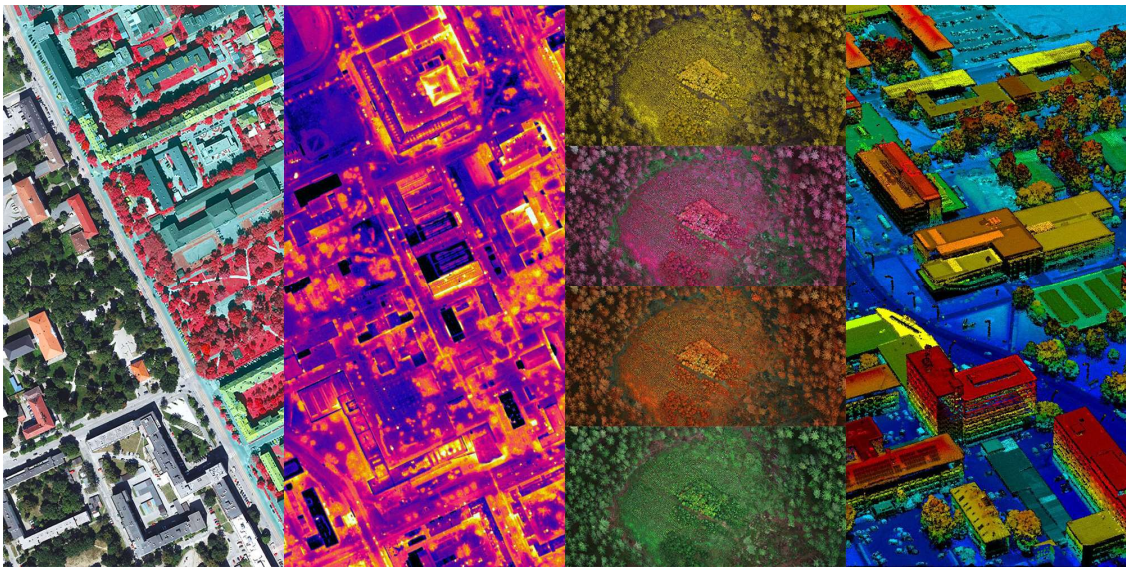
Company's description:

PHOTOMAP is a Slovak remote sensing company that specializes in geospatial data acquisition, processing, and analysis. Our key strength lies in the long unrivalled experience dated since 2003 in using a variety of platforms and sensors. We operate several UAVs, aircrafts and cooperate with satellite data providers in order to deliver the most suitable and accurate products for your project needs. With our ability to deliver multispectral, thermal, hyperspectral, lidar and radar data products and analysis, we can satisfy even the most demanding clients.



Several product examples: RGB/CIR, Thermal, Hyperspectral composites, Lidar.

Services:

- Data acquisition services
  - Depending on project size and needs, we can acquire data using an UAV, aircraft or satellite to deliver high-resolution imagery, thermal, hyperspectral lidar or radar data
- Data processing services
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  - DSM, DTM generation from stereo imagery or lidar
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- Analytical services
  - Classification of lidar and hyperspectral data
  - Change detection: Illegal construction, deforestation, fire and flood damage, vegetation health
  - Risk assessment: Identification of potentially dangerous vegetation for powerlines and other infrastructure
- Consultation services
  - PHOTOMAP provides consultation services in the Earth observation field to various clients and other EARSC members (CybELE)

References:

[1] https://www.photomap.sk/referencie.html

Data used:

Satellite data:
WorldView-1/2/3/4, GeoEye-1, Pleiades, SPOT 4/5/6/7, QuickBird, Ikonos, Sentinel-1/2/3, Landsat 5/7/8, TrippleSat, KazEOSat -1/2, TerraSAR-X

Airborne data:
Multispectral – UltraCam Eagle Mark 3, UltraCam XP, UltraCam LP, PhaseOne (RGB+NIR), Lidar – Riegel VQ780 I, Leica ALS70, Hyperspectral – AISA Kestrel 10, Thermal - DigiTHERM

UAV data:
Multispectral – LEICA RCD30, Lidar – GL-70, Hyperspectral – AISA Kestrel 10, Thermal – DigiTHERM

3. Security & Safety

a. Food Security & Safety

Company profile

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Contact Person
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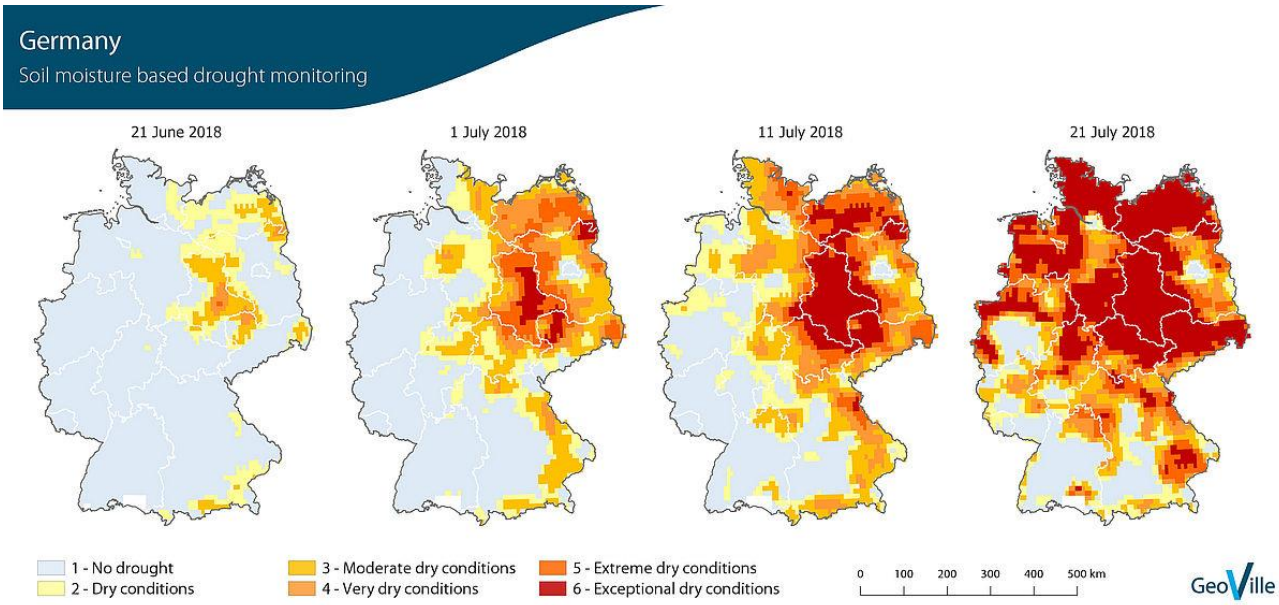
Company description:

GeoVille (http://www.geoville.com) is an internationally operating company, providing consultancy, services and products related to remote sensing, geo-information and geographic information systems and has longstanding experience in the field of environmental monitoring, focusing on the development of a multi-scale and multi-purpose land monitoring system.
GeoVille's focus is on the integration of satellite earth observation-based information and in-situ data to provide assessment and monitoring services. We enable geographic accounting of human and natural dynamics through a satellite's eye, adding the spatial dimension to information gathering, analysis and monitoring, for policy support and informed decision making.



Services:
This EO service provides time-series information on droughts by determining surface dryness and soil moisture anomalies as well as vegetation stress and degradation. Climate change is expected to increasingly impact precipitation patterns and evapotranspiration processes. Thus, there will be a significant influence on the availability of soil and groundwater leading to higher frequent, longer and more severe droughts in many regions. With regard to climate change monitoring and Green Deal Reporting Obligations the services support the Sustainable Development Goal Reporting SDG Target 1.5, Target 2.4, Target 6.4, Target 13.1, Target 15.3

Products (in bullet points):
Drought extent and severity maps:

- Identifying droughts
- Influence on the availability of soil and groundwater
- Spatial resolution available at different scales (e.g. 10m from 2016 onwards)
- Temporal coverage from 2001 until now
- Temporal resolution from monthly to seasonal

Derived indicators:

- Vegetation stress
- Soil moisture anomaly
- Trend analyses
- Hazard extent map / Risk exposure
- Crop zoning agriculture
- etc.

References:
[1] https://www.geoville.com
[2] https://www.copernicus.eu/en/european-drought-observatory

Data used:
Satellite data: Optical (Sentinel-2, Landsat-8, MODIS, Geostationary satellites); Radar (Sentinel-1, MetOp ASCAT, SMAP, TRMM, SSM/I)
Supporting data: (in-situ information of drought parameters)

Company profile

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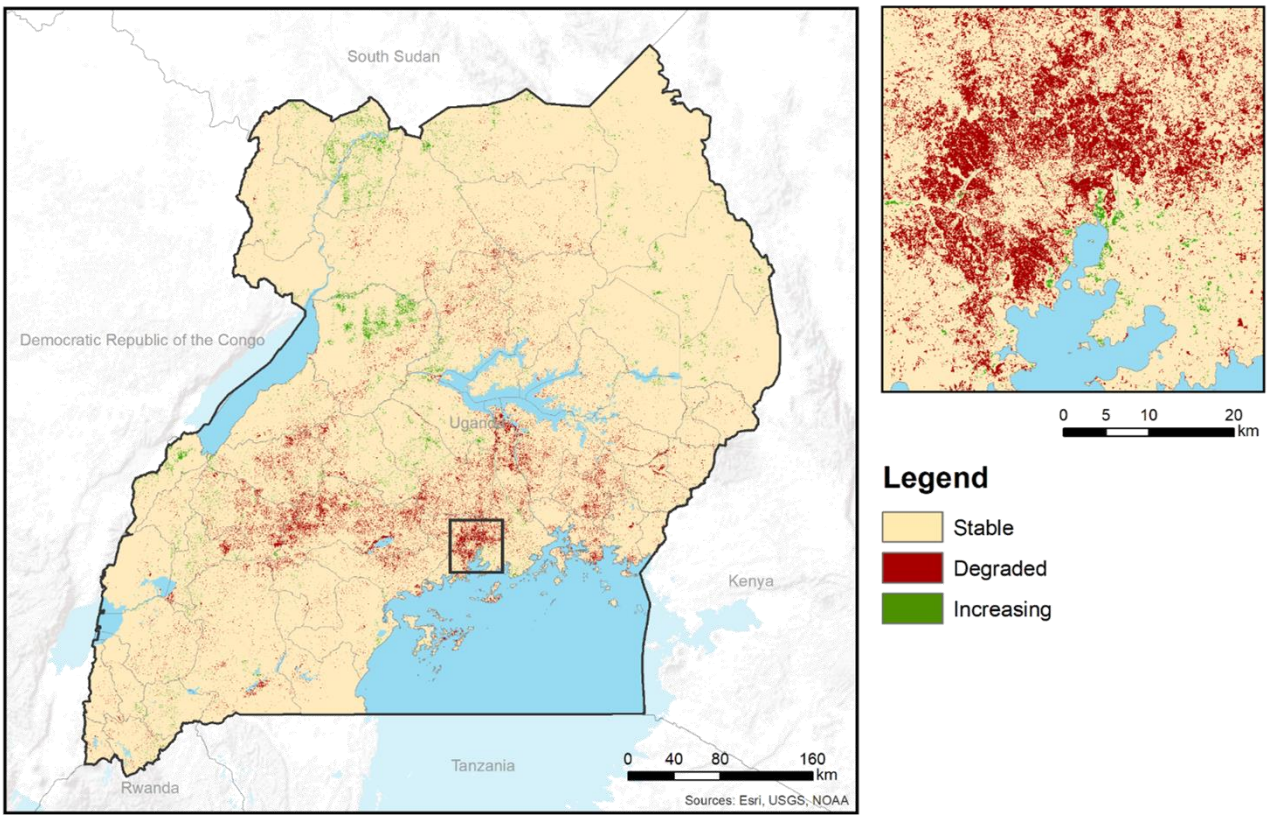

Services:
The service aims at measuring and monitoring land degradation by calculating the ratio between the degraded land area and the total land area of a country. With regard to climate change monitoring and Green Deal Reporting Obligations the services support the Sustainable Development Goal Reporting SDG Target 15.3

Products (in bullet points):
Land Cover:

- Changes in distribution of vegetation types, and human-impacted infrastructure, reflecting the use of land resources (i.e., soil, water and biodiversity) for agriculture, forestry, human settlements and other purposes
- Spatial resolution reaching from VHR to HR

Land Productivity:

- Total above-ground net primary production (NPP) defined as the energy fixated by plants minus their respiration which translates into the rate of biomass accumulation that delivers ecosystem services
- Spatial resolution reaching from VHR to HR

References:
[1] https://www.geoville.com
[2] https://www.esa-landcover-cci.org/
[3] https://land.copernicus.eu/global/products/lc
[4] http://publications.jrc.ec.europa.eu/repository/handle/JRC80541
[5] http://www.fao.org/soils-portal/soil-survey/soil-maps-and-databases/harmonized-world-soil-database-v12/en/

Data used:
Satellite data: Sentinel-2, Landsat, Sentinel-3, MODIS, MERIS, VIIRS, SPOT Vegetation, PROBA-V, Commercial satellites
Supporting data: Global datasets (e.g. CCI, Copernicus Dynamic Land Cover, JRC's Land Productivity Dynamics (LPD) dataset, Copernicus Global Land Service products, Harmonized World Soil Database (HWSD), etc.

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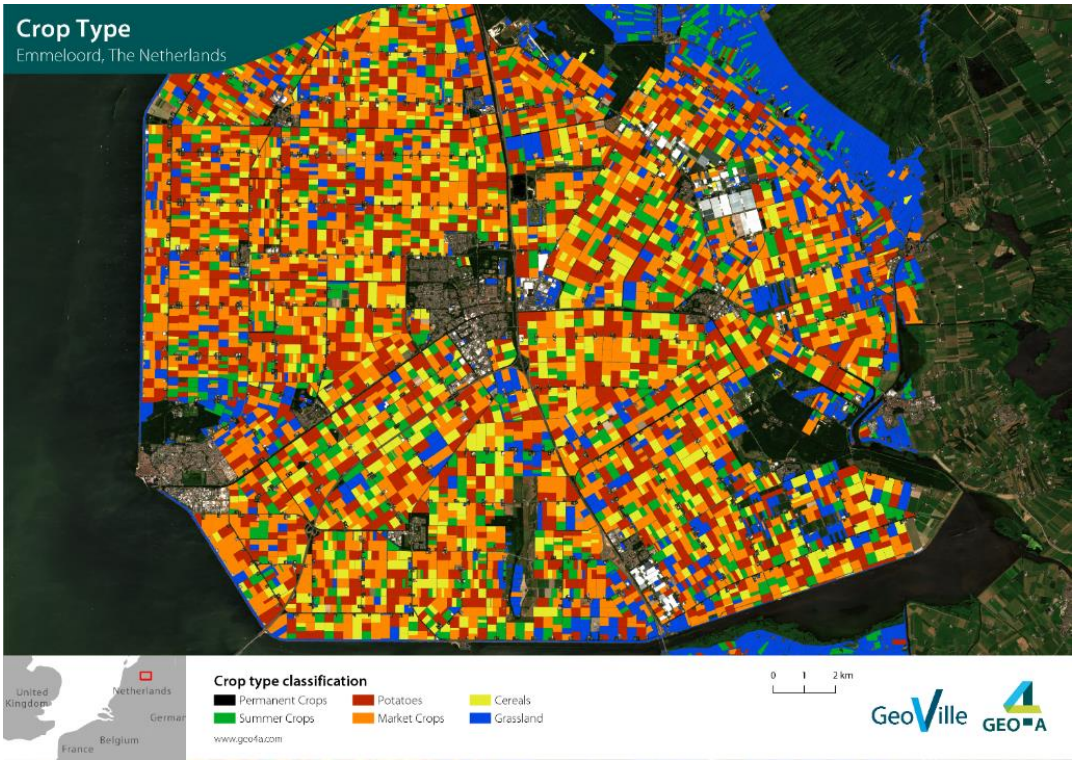

Crop types in a selected area of interest (Emmeloord, The Netherlands) (Source: GeoVille/Geo4A)

Services:
The crop type detection service provides information on types and location of crops grown with different levels of detail. With regard to climate change monitoring and Green Deal Reporting Obligations the services support the Sustainable Development Goal Reporting SDG Target 2.3, Target 2.4, Target 6.4, Target 15.4

Products (in bullet points):
Crop type and condition:
- Besides summer and winter crops, various types such as potatoes, maize, cereals, and other field crops can be detected using Earth observation techniques.
- Spatial resolution: 10m
- Temporal resolution: from the beginning of the respective growing season, various time steps

Derived indicators:
- Regional yield statistics
- Functionalities of plants, early stress detection
- Information on crop rotation and on crop (seasonal) calendar
- Risk exposure
- Information of vegetation stages
- Detect crop damage at field level
- Impact on food security

References:
[1] https://www.geoville.com
[2] https://www.geo4a.com

Data used:
Satellite data: Optical (Sentinel-2, Landsat-7, Landsat-8, or commercial VHR / HHR satellite data), Radar (Sentinel-1)
Supporting data: Field parcel delineation; in-situ crop type information such as LPIS

6. Disaster & Geohazards

a. Floods

Company profile

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Parc d'Innovation
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FRANCE
https://sertit.unistra.fr/

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Stéphanie BATTISTON
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+33 (0)3 68 85 48 17

Company description:

For more than 30 years, ICube-SERTIT is a pioneer in exploiting satellite data to derive information that has high societal impact. In a world marked by climate change, natural disasters, environmental degradation and constant pressure on resources, ICube-SERTIT delivers a wide range of services to its customers: public services, international institutions, private sector, including the insurance sector.
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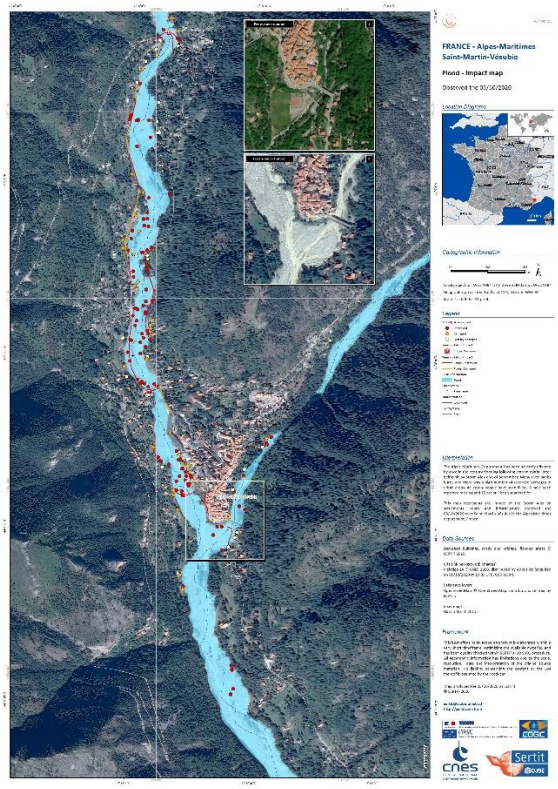

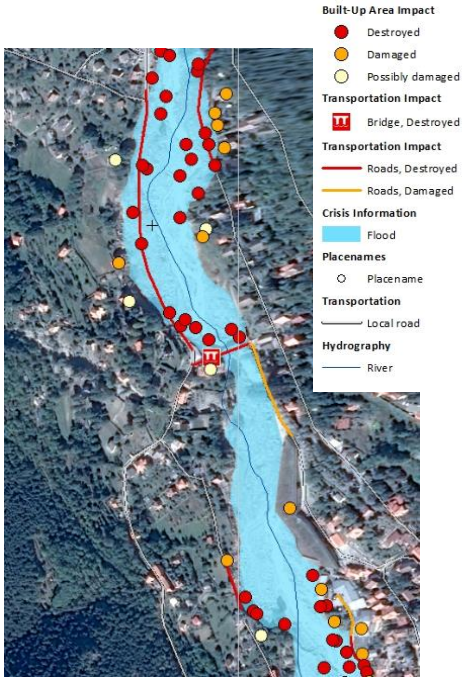

Services:
ICube-SERTIT's world-renowned **Disaster Rapid Mapping Service** is unique in France for its **24/7/365** operational class, its management and production capacity during solicitation, and its ISO 9001 certification. This service is used in emergency situations to meet the information needs of risk, crisis and reconstruction management actors before, during and after disasters. It is an operator in the European Copernicus Emergency Management Service (Rapid Mapping and Risk & Recovery Mapping) and the International Charter Space and Major Disasters dedicated to national civil securities. It also works alongside **local and regional players**, as well as with the world of insurance, to answer their specific needs in **rush** (hours) **or standard modes** (days to weeks).

Products (in bullet points):
Crisis Rapid Mapping:
- Disaster extent and monitoring
- Assessment of human and material impact, damage grading

Risk & Recovery Mapping:
- Extent of simulated risks
- Consolidation of the damages of an event
- Monitoring and analysis of reconstruction
- Detailed assessment of human, material, environmental and economic impacts

References:
[1] https://sertit.unistra.fr/en/wp-content/themes/sertitheme/assets/prestations-assets/prestations/pdf/en/01_ICube-SERTIT_Portfolio_2021_EN_RMS.pdf
[2] https://sertit.unistra.fr/en/wp-content/themes/sertitheme/assets/prestations-assets/prestations/pdf/en/02_ICube-SERTIT_Portfolio_2021_EN_RR.pdf

Data used:
Spatial data: All kinds of optical and SAR satellite imagery, plus drone or aerial data if available
Other data: Topographic, socio-economic, social media and user's field data

PHOTOMAP

Company profile

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040 12 Košice
Slovakia
TAX ID: SK2021736145
https://www.photomap.sk

Contact Person
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+421 905 966 022
durica@photomap.sk

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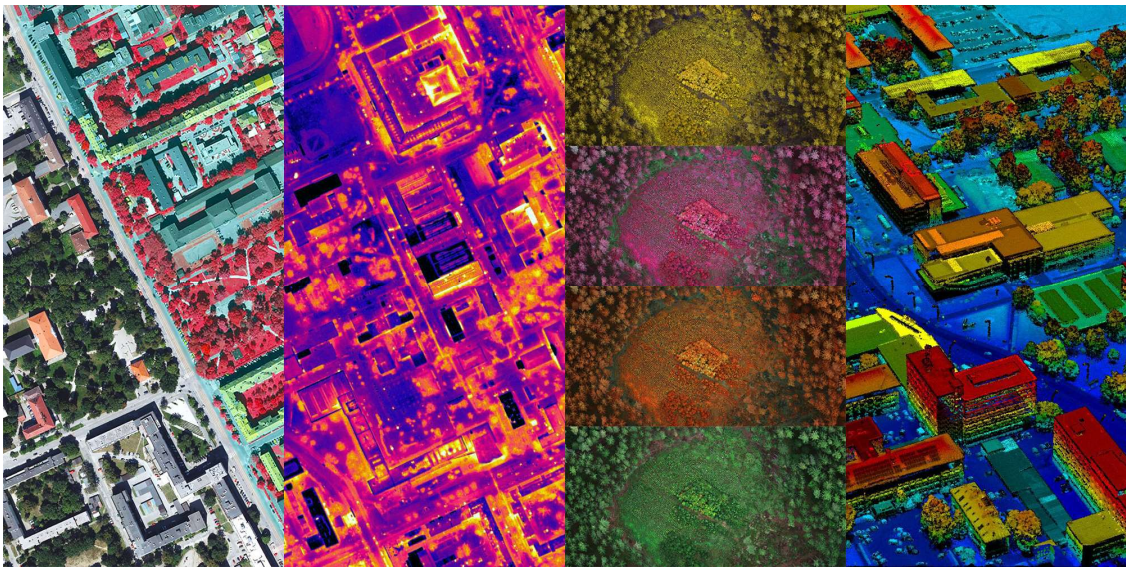

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UAV data:
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6. Disaster & Geohazards

b. Landslides

insar.sk
Company's profile

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Slovakia
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TAX ID: SK 212 006 9446
https://insar.space
https://remotio.space

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Ing. Matus Bakon, PhD.
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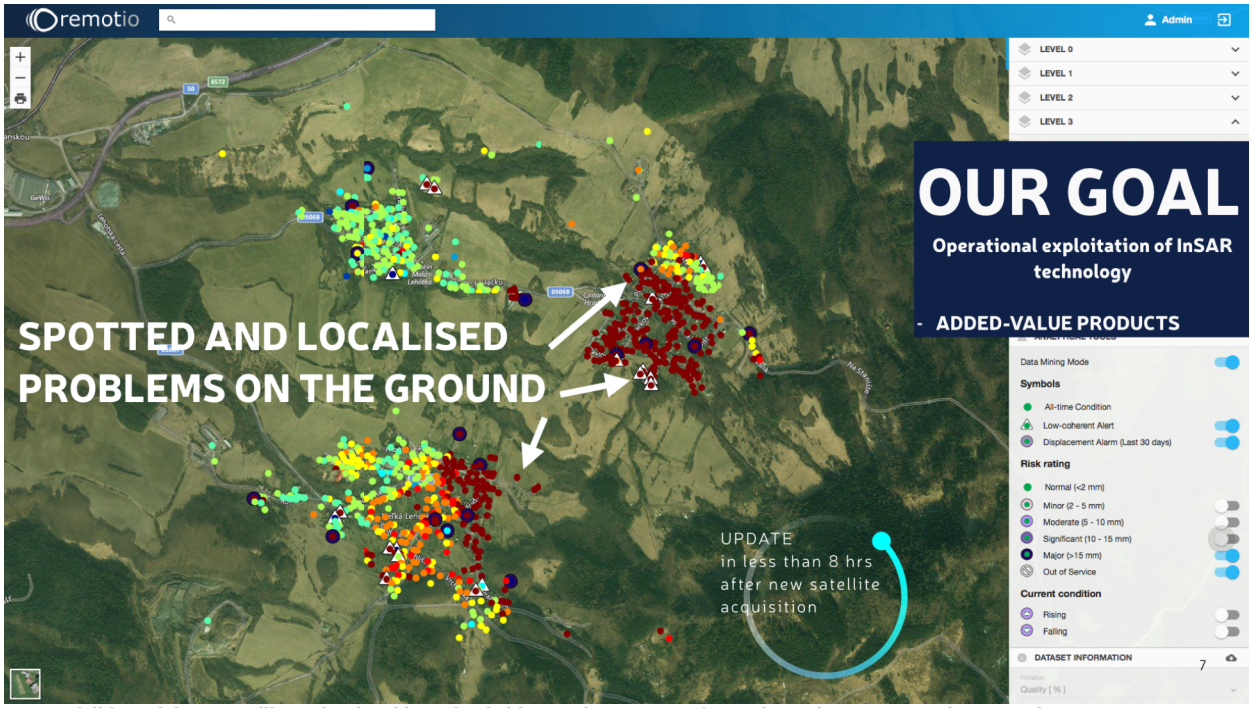

Landslide activity over villages in Slovakia and subsidence of up to -3 cm/year shown in remotIO web-app environment

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[3] https://ieeexplore.ieee.org/document/7895168/
[4] https://copernicus-masters.com/winner/remotio-x-retrieval-of-motion-and-potential-deformation-threats/

Data used:
Sentinel-1 + any other SAR satellites (TerraSAR-X, Cosmo-SkyMed, etc.)

Company profile

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Contact Person
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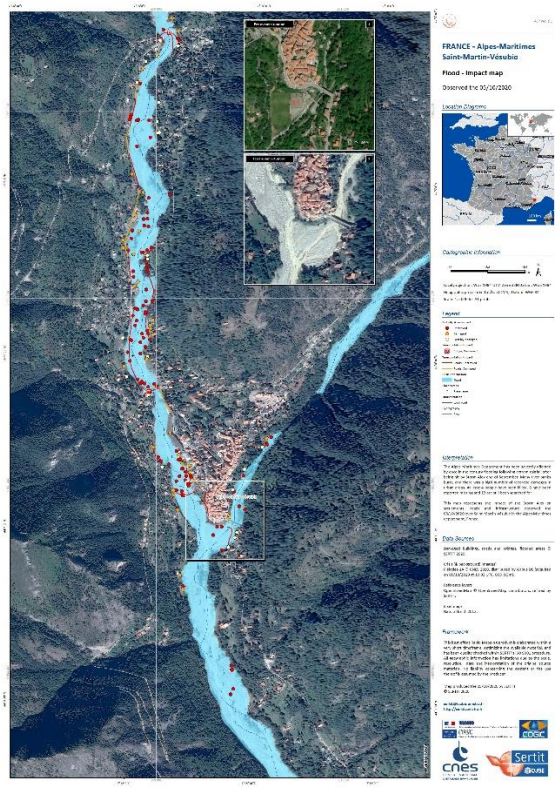
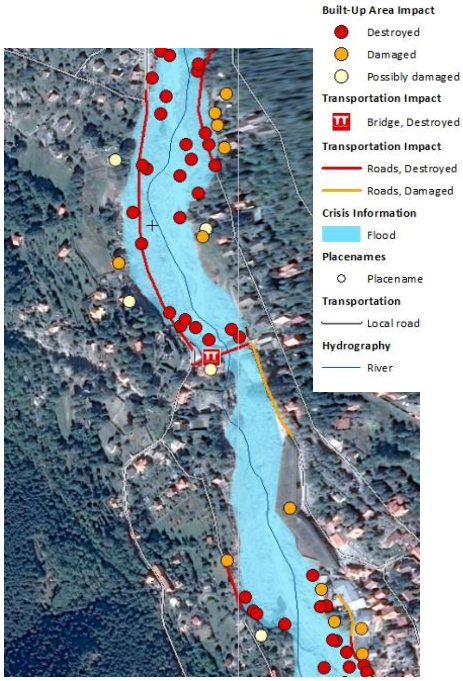
Using satellite and aerial imagery, ICube-SERTIT designs products that meet societal needs in various domains (emergency mapping, risk and reconstruction, water & forest management, land use & urban planning…) using cutting edge technology and methods including Machine Learning and AI, while combining Earth Observation (EO) derived layers with increasingly abundant ancillary geo-spatial data to provide services tailored to client requests.





Services:
ICube-SERTIT's world-renowned **Disaster Rapid Mapping Service** is unique in France for its **24/7/365** operational class, its management and production capacity during solicitation, and its ISO 9001 certification. This service is used in emergency situations to meet the information needs of risk, crisis and reconstruction management actors before, during and after disasters. It is an operator in the European Copernicus Emergency Management Service (Rapid Mapping and Risk & Recovery Mapping) and the International Charter Space and Major Disasters dedicated to national civil securities. It also works alongside **local and regional players**, as well as with the world of insurance, to answer their specific needs in **rush** (hours) **or standard modes** (days to weeks).

Products (in bullet points):
Crisis Rapid Mapping:
- Disaster extent and monitoring
- Assessment of human and material impact, damage grading

Risk & Recovery Mapping:
- Extent of simulated risks
- Consolidation of the damages of an event
- Monitoring and analysis of reconstruction
- Detailed assessment of human, material, environmental and economic impacts

References:
[1] https://sertit.unistra.fr/en/wp-content/themes/sertitheme/assets/prestations-assets/prestations/pdf/en/01_ICube-SERTIT_Portfolio_2021_EN_RMS.pdf
[2] https://sertit.unistra.fr/en/wp-content/themes/sertitheme/assets/prestations-assets/prestations/pdf/en/02_ICube-SERTIT_Portfolio_2021_EN_RR.pdf

Data used:
Spatial data: All kinds of optical and SAR satellite imagery, plus drone or aerial data if available
Other data: Topographic, socio-economic, social media and user's field data

6. Disaster & Geohazards

c. Fires

Company profile

Address
Parc d'Innovation
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FRANCE

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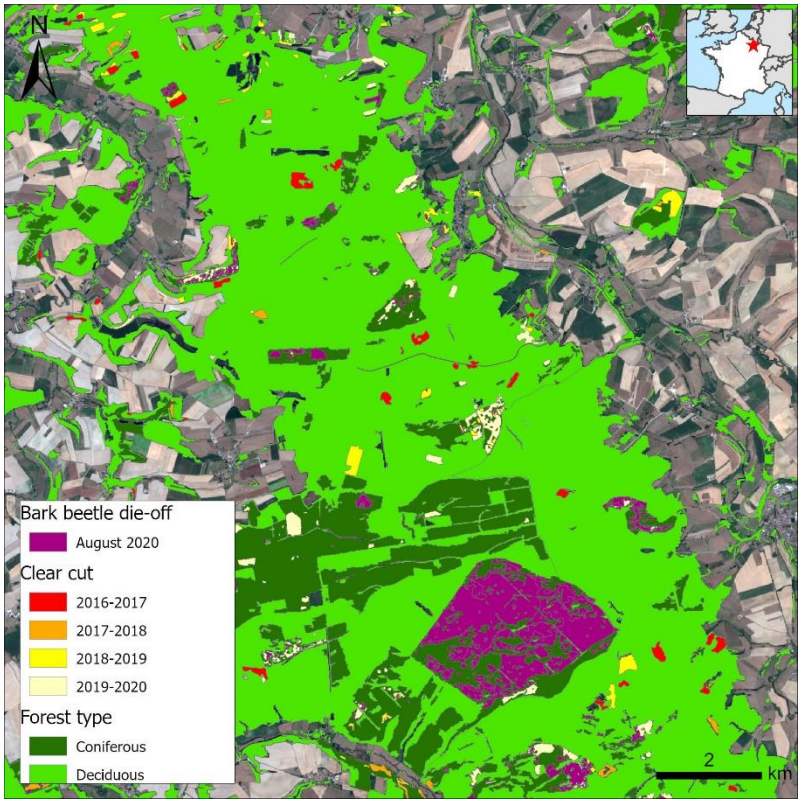
Company description:

For more than 30 years, ICube-SERTIT is a pioneer in exploiting satellite data to derive information that has high societal impact. In a world marked by climate change, natural disasters, environmental degradation and constant pressure on resources, ICube-SERTIT delivers a wide range of services to its customers: public services, international institutions, private sector, including the insurance sector.
Using satellite and aerial imagery, ICube-SERTIT designs products that meet societal needs in various domains (emergency mapping, risk and reconstruction, water & forest management, land use & urban planning…) using cutting edge technology and methods including Machine Learning and AI, while combining Earth Observation (EO) derived layers with increasingly abundant ancillary geo-spatial data to provide services tailored to client requests.



Services:
ICube-SERTIT uses satellite imagery to provide a list of forestry related services, including for instance forest cover mapping and monitoring with tree types and species differentiation, assessment of one-off events (storms, fires, parasitic attacks…) impact and consequences on forests, or detailed tree stands characterization through EO derived height and density indexes.

Products (in bullet points):
Forest mapping:
- Forest cover extent
- Clear-cuts, reforestation, afforestation

Forest characterization:
- Tree types and species differentiation
- Tree stands height and density indexes for sylvicultural management purposes

Impact and consequences of rapid/long-lasting changes:
- Bark beetle die-offs
- Windfall damage mapping
- Forest fire mapping and forestry recolonization

References:
[1] https://sertit.unistra.fr/en/wp-content/themes/sertitheme/assets/prestations-assets/prestations/pdf/en/04_ICube-SERTIT_Portfolio_2021_EN_Forest.pdf
[2] https://sertit.unistra.fr/en/wp-content/themes/sertitheme/assets/prestations-assets/prestations/pdf/en/05_ICube-SERTIT_Portfolio_2021_EN_ClearCuts.pdf
[3] https://data.public.lu/en/datasets/regiowood-forest-types-2016/

Data used:
Satellite data: All kinds of optical (Sentinel-2, SPOT 6-7, Pléiades...) and SAR (Sentinel-1) imagery
Ground data: Tree stands characteristics resulting from in-field campaigns