



Joint Workshop of the GOFC-GOLD SCERIN and MedRIN Networks

CIHEAM conference center, Chania, Greece, July 16 – July 19, 2024
Land Cover Change (LCC) and Extreme Events in the Context of Climate Change

Mediterranean Agronomic Institute of Chania
Region of Crete
Eratosthenes Center of Excellence, Cyprus University of Technology
Aristotle University of Thessaloniki
NASA LCLUC Program
GOFC-GOLD and START, USA



EXCELSIOR: Earth Observation in the EMMENA region

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CONSORTIUM



AFFILIATED ENTITIES



This project has received funding from the European Union's "Horizon 2020 Research and Innovation Programme" under Grant Agreement No 857510".



This project has received funding from the Government of the Republic of Cyprus through the "Directorate General for European Programmes, Coordination and and Development".



This project is co-funded by the Cyprus University of Technology.

www.cut.ac.cy Cyprus University of Technology, 2007 (2003 by law)

www.excelcior2020.eu EXCELSIOR H2020 Teaming Project (2019): **Project**

www.eratosthenes.org.cy ERATOSTHENES CoE (2020): **New Entity**



Credit: Copernicus Sentinel data (2015)/ESA

EXCELSIOR – Upgrade RS Lab at CUT to ERATOSTHENES Centre of Excellence

- **Funded under H2020 & Republic of Cyprus**
- **Pillar:** Spreading Excellence and Widening Participation
- **Work Programme Year:** H2020-2018-2020
- **Call:** H2020-WIDESPREAD-2018-2020
- **Topic:** WIDESPREAD-01-2018-2019 Teaming 2
- **Type of action:** CSA (Coordination and support action)
- **Grant Agreement number:** 857510, Acronym: EXCELSIOR
- **Total Budget:** >38,000,000 € (15 millions from EC+ 15 from Republic of Cyprus+ 8 millions from CUT, etc.)
- **Duration:** 7 Years (EC) + 8 years (Republic of Cyprus/RC)
- **Start:** 1 October 2019 / End: 30 September 2026 (EC) / 30 September 2034 (RC)



For more information visit: <https://excelsior2020.eu/> and <https://eratosthenes.org.cy/>

The idea behind EXCELSIOR

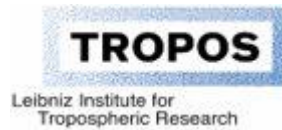
- **Our mission:**

To upgrade the existing Remote Sensing & Geo-Environment Lab (ERATOSTHENES Research Centre), within the Faculty of Engineering & Technology of the Cyprus University of Technology (since 2007), into a **sustainable, viable and autonomous Centre of Excellence: the ERATOSTHENES Centre of Excellence (ECoE).**

- **Our vision:**

The ERATOSTHENES CoE, becomes a **world-class Digital Innovation Hub (DIH) for EO and Geospatial Information** and develops into the **reference Centre in the Eastern Mediterranean, Middle East and North Africa Region (EMMENA).**

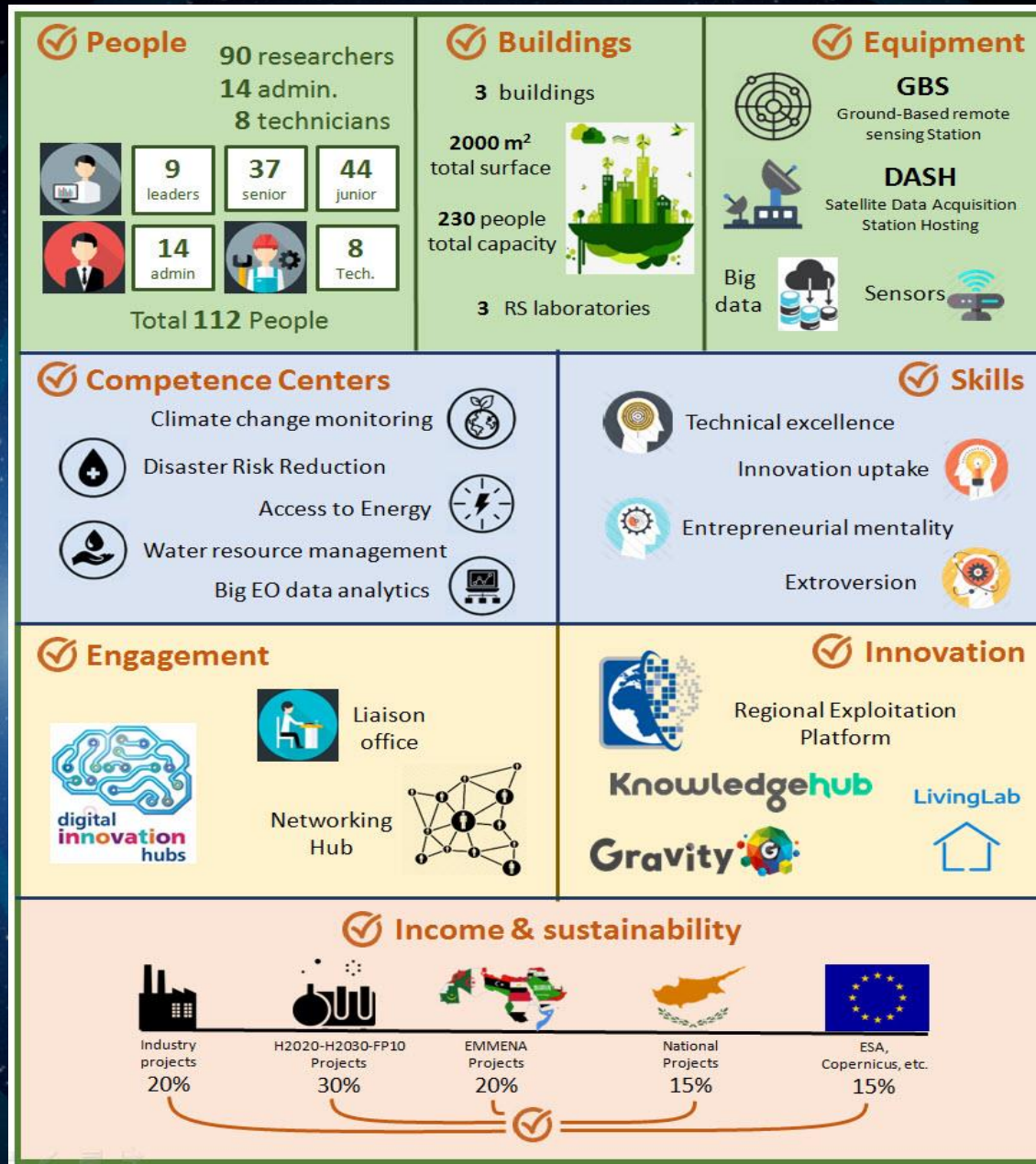
EXCELSIOR Consortium

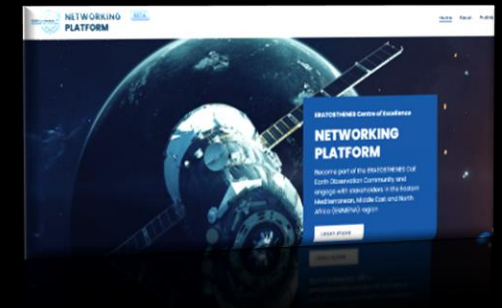
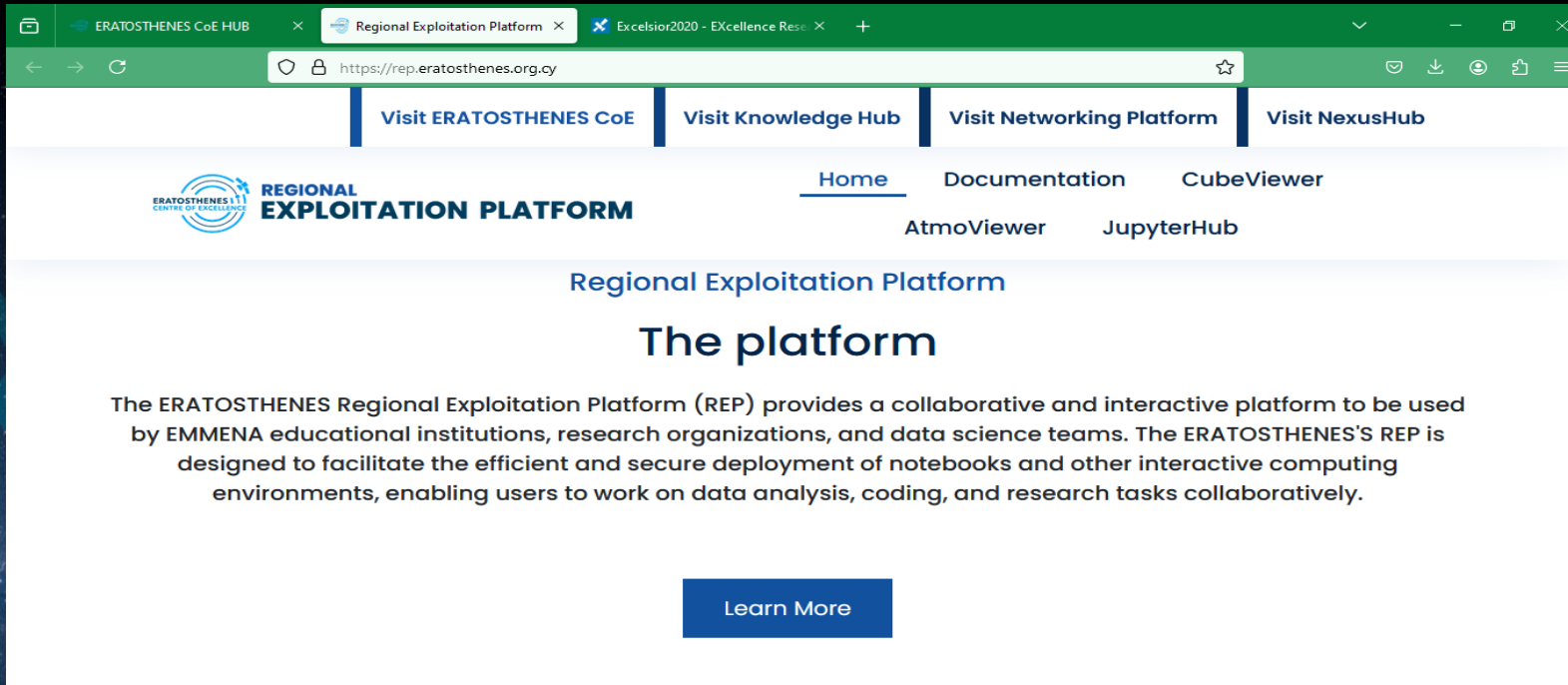


Affiliated partners



Excelsior Implementation





The ERATOSTHENES Regional exploitation platform is a web application that acts as a gateway to a shared computing environment for multiple users in EMMENA region and makes available ECoE's and 3rd party data, models, algorithms etc. to EMMENA stakeholders.

The ERATOSTHENES CoE consists of three Departments:

- **Environment and Climate**

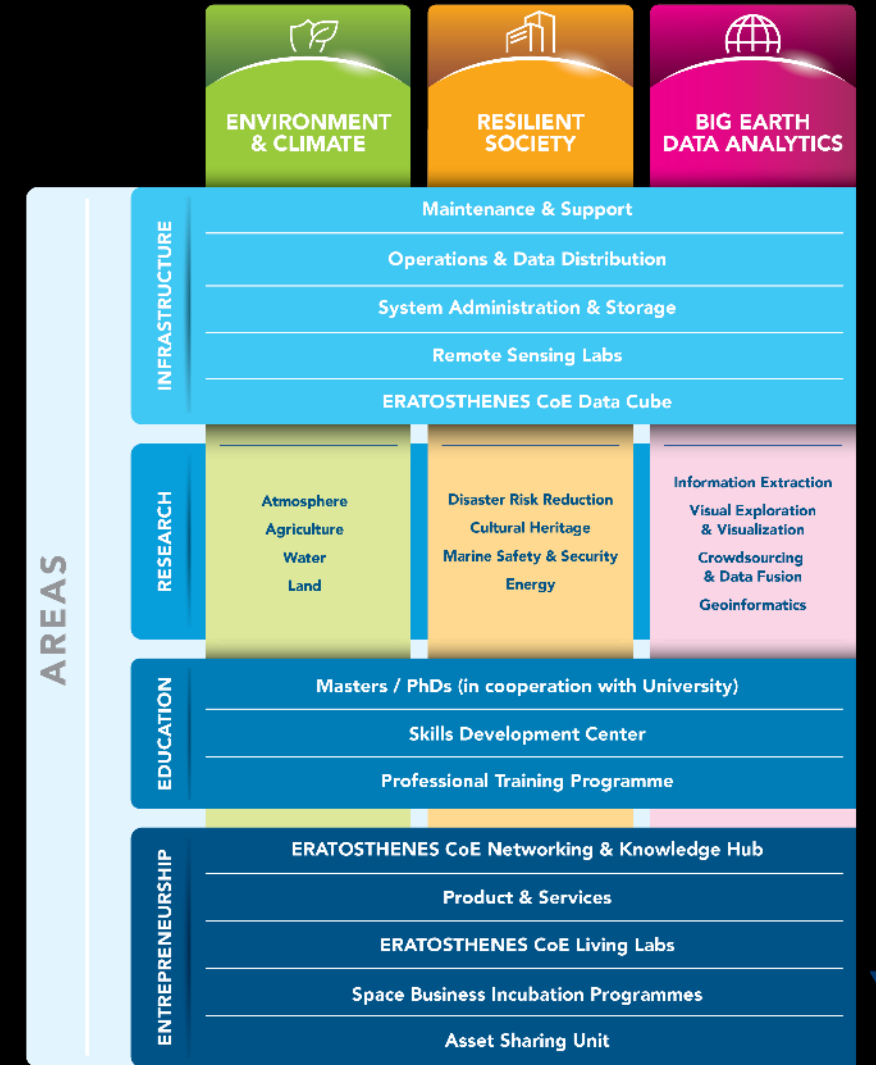
- Atmosphere
- Agriculture
- Water
- Land

- **Resilient Society**

- Disaster Risk Reduction
- Cultural Heritage
- Access to Energy
- Marine Safety and Security

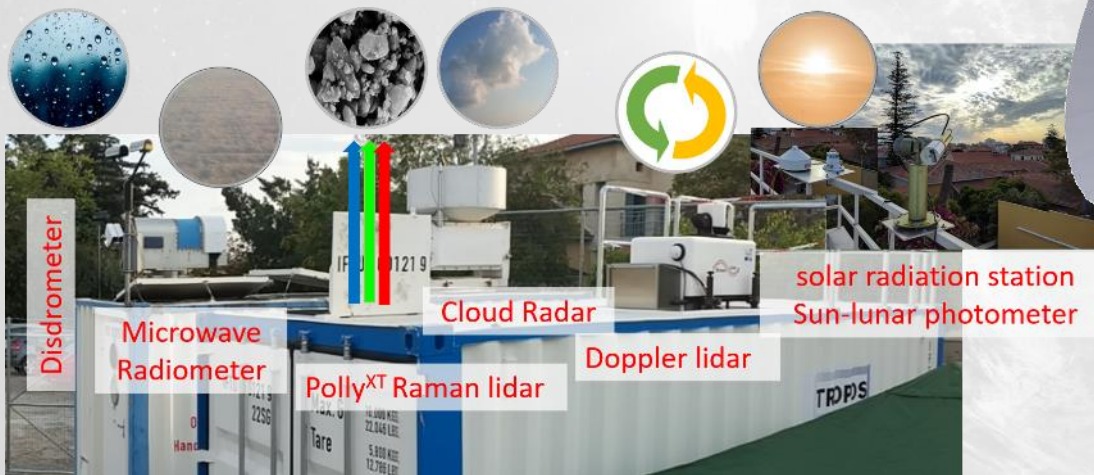
- **Big Earth Data Analytics**

- Information extraction
- Visual exploration & visualization
- Crowdsourcing & data fusion
- Geoinformatics



Investment

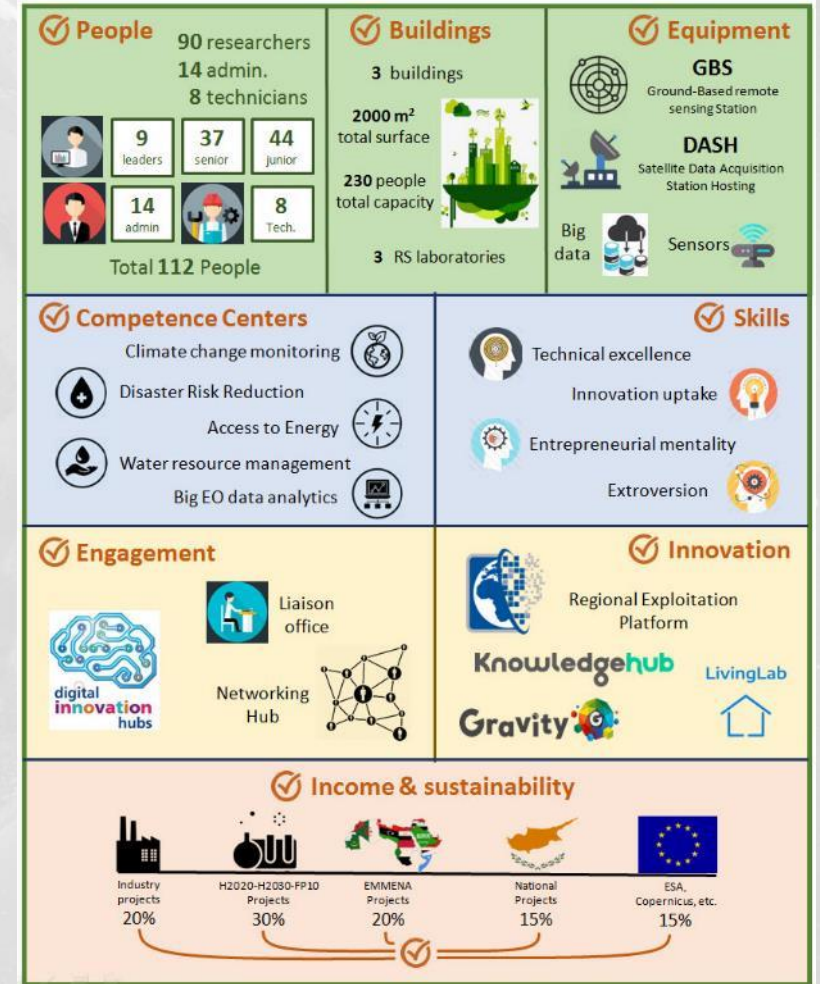
- 112 Personnel in 7 years, 132 in 15 years
- 2000m² Offices and Research Laboratories
- State-of-the-art-Remote Sensing Research Infrastructure



Ground based station (GBS)



Data Acquisition Station (DAS)



Data Acquisition Station (DAS)

Through governmental funding ECoE has acquired key infrastructure and equipment that will directly contribute to the Research Excellence and Service capacity of the ECoE such as the Data Acquisition Station (DAS).

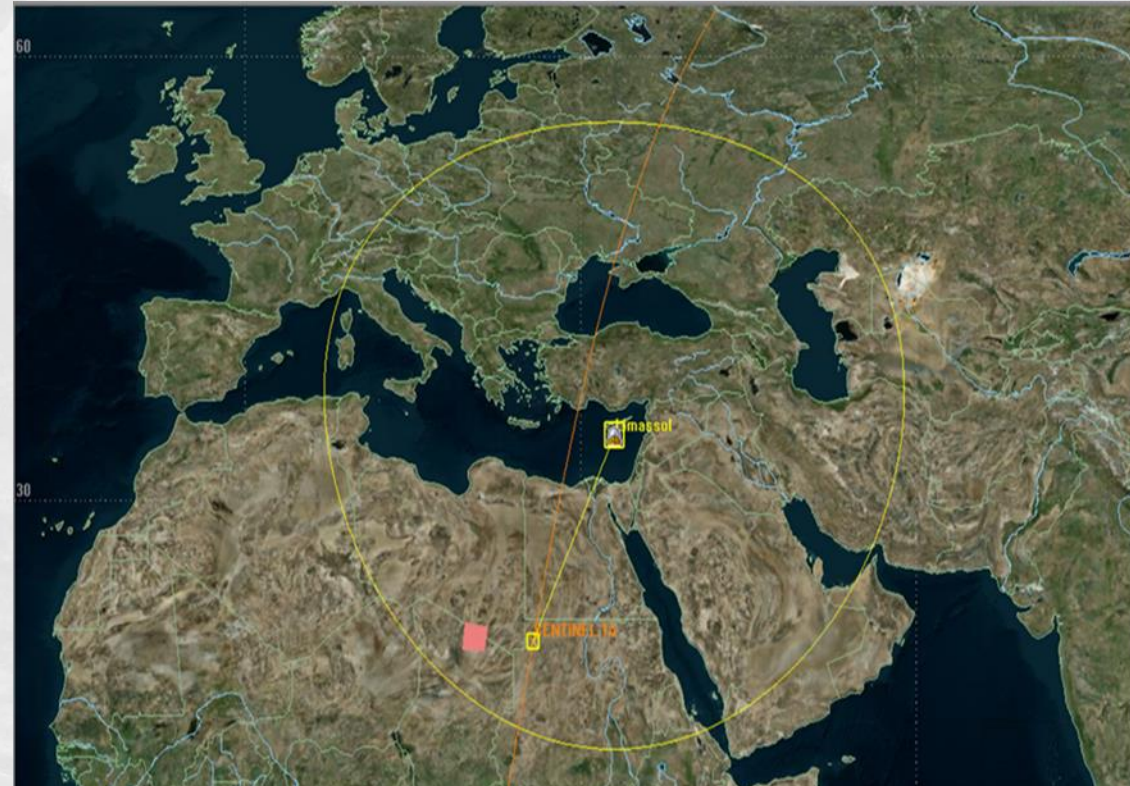
The DAS is being purchased and will be operational offering Commercial Services for international Business Customers in December 2025

Within EXCELSIOR, ECoE is supported – amongst others – by the **German Aerospace Center (DLR)** in establishing DAS

CYTA – as strategic partner of ECoE – will host and operate DAS



Deutsches Zentrum
für Luft- und Raumfahrt
German Aerospace Center



Technical Description of the Data Acquisition Station

- 9m full-motion Triband Antenna from Safran -France
- To be installed at 35°.049 longitude & 33°.284 latitude
- Simultaneous Reception in S, X & Ka Bands
- Tracking satellites orbiting as low as 400km
- Horizon visibility down to 5° elevation
- Transmit capability in S-Band (both RHCP & LHCP) for TT&C services
- Transmit EIRP up to 60dBW per polarization
- Pointing accuracy: < 0,045° rms
- Tracking accuracy: < 0,015° rms
- Cortex Low & High Data Rate Baseband equipment
-



GBS ATMOSPHERIC REMOTE SENSING STATION IN LIMASSOL: Fully operational



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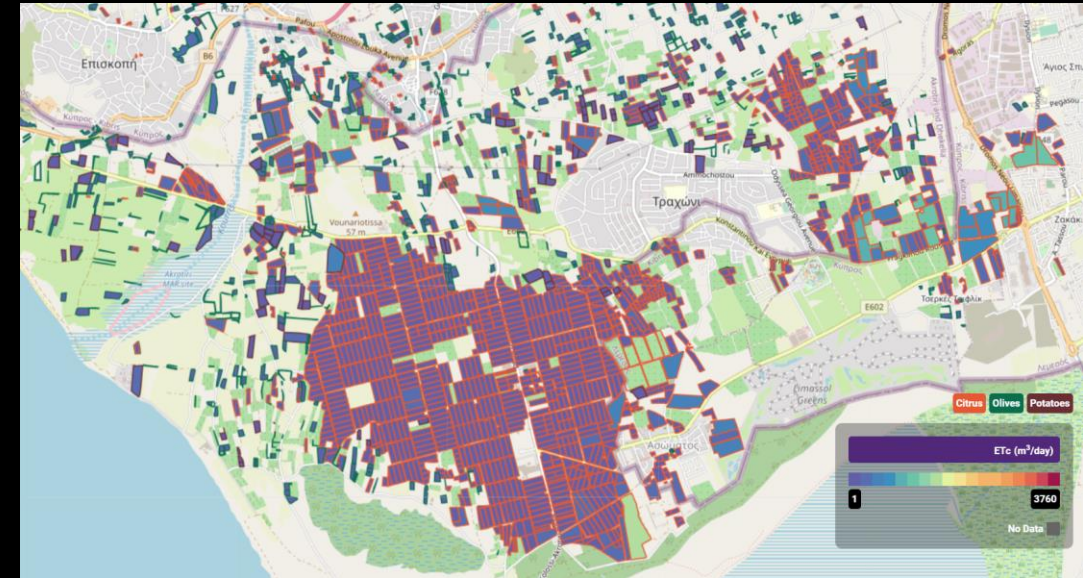
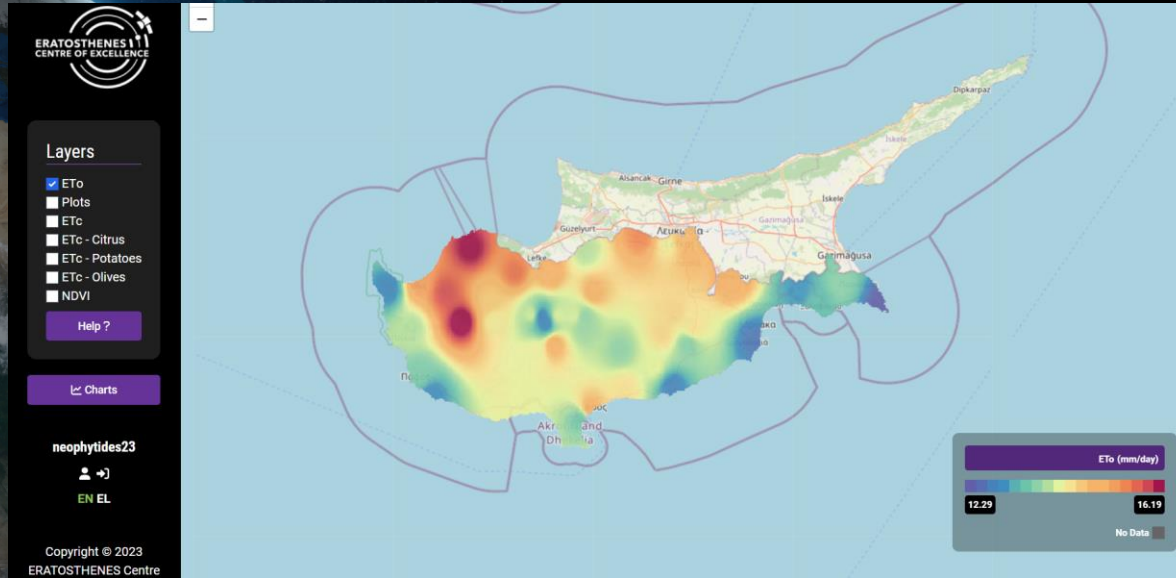
TECHNOLOGY APPLICATIONS – MATURE/IN PILOT STUDIES

- Agri-Nexus-Hub tool for agricultural applications (TRL5) (ECoE)
- UVI Risk assessment tool for health and agricultural applications (TRL4) (ECoE - PMOD/WRC – NOA)
- Earthquake risk assessment tool (TRL4) (CUT –ECoE – U Sheffield)
- Earth Observation for Cultural Property Documentation and Protection (TRL4) (ECoE – DLR)

TECHNOLOGY APPLICATIONS AT THE EARLY STAGES OF DEVELOPMENT

- Cyprus Geohazards Observatory (Landslides/Earthquakes) (TRL4) (ECoE – NOA)
- Earth Observation for Cultural Property Documentation and Protection (TRL4) (ECoE – DLR)
- Allocation of Electric Vehicle Charging using GIS (TRL4) (ECoE-FOSS)
- Sowing & Harvesting tool for agricultural applications (ECoE - NOA)
- Carbon Farming Platform (ECoE)
- Cyprus Fire and Flood Observatory (Disaster Risk Reduction Fires, Floods) (ECoE – NOA)
- Atmosphere Identification Tools (GBS infrastructure) (ECoE – TROPOS)
- Marine Identification System (Early Warning System) (ECoE - DLR)
- Marine Pollution Monitor (ECoE - DLR)
- Digital tools for risk assessment of CH sites (ECoE – DLR)
- Digital technology tool for identifying unknown buried archaeological sites (ECoE – DLR)

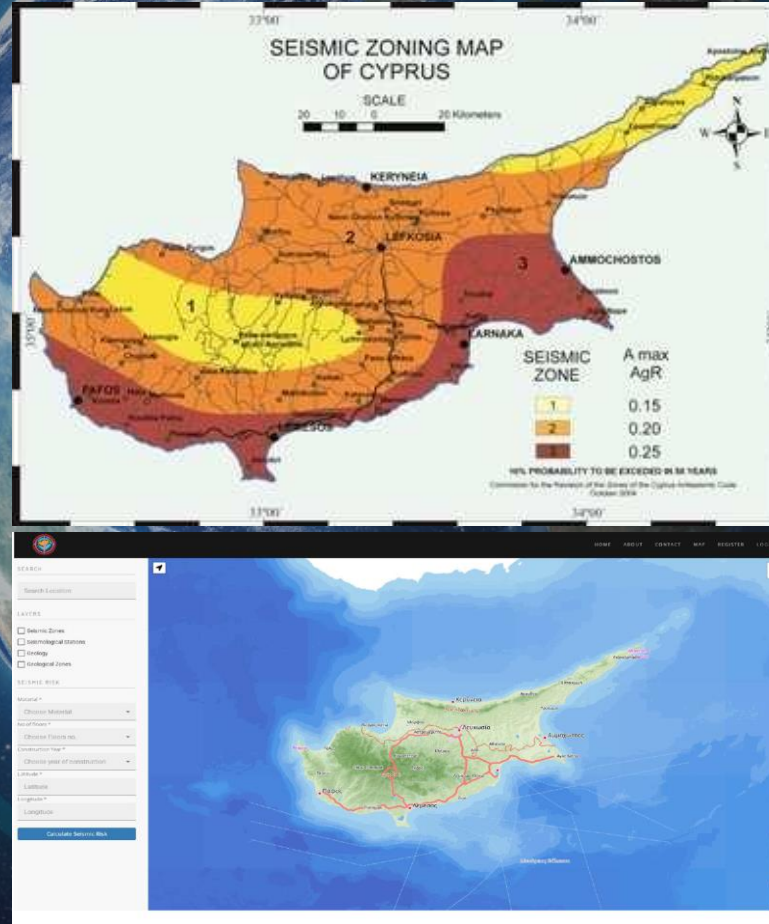
Agri Nexus Hub Platform at a glance



- ➔ A day-to-day informational tool for farmers to optimize irrigation management
- ➔ Daily Potential Evapotranspiration calculations
- ➔ Citrus, Potatoes and Olives

Platform Development - Seismic Risk Assessment

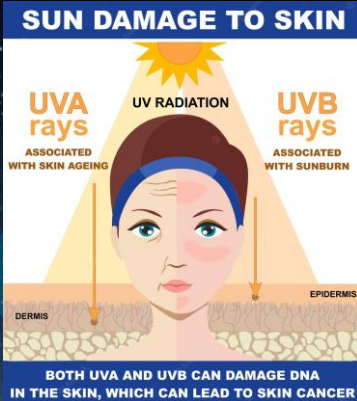
- The seismic vulnerability of a building is considered automatically in the assessment through a GIS tool
- User selects location of building on interactive map of Cyprus (connected with seismic zones and soil conditions)
- Upon selection of location, the vulnerability of the building to the specific earthquake event is estimated.



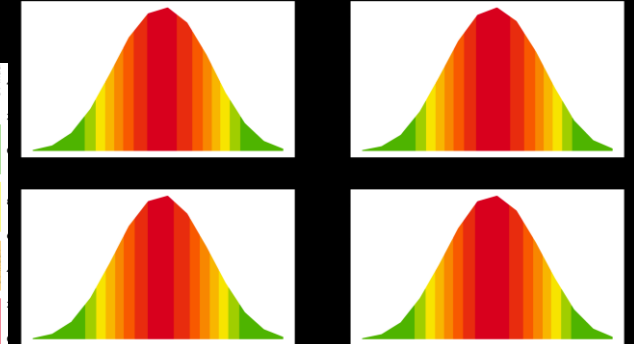
Strategic Partner:
GEOMATIC
TECHNOLOGIES LTD
(Nicosia, Cyprus)



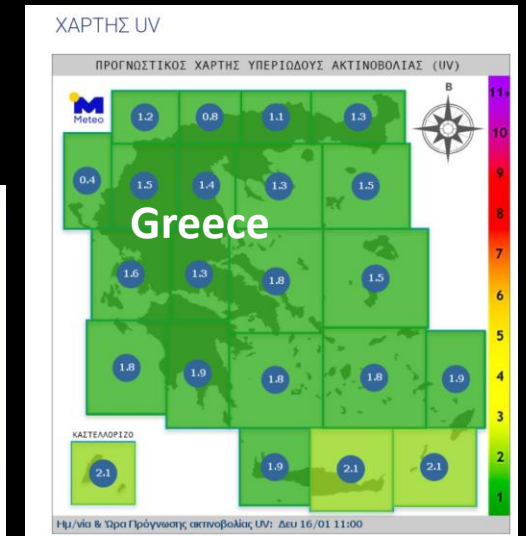
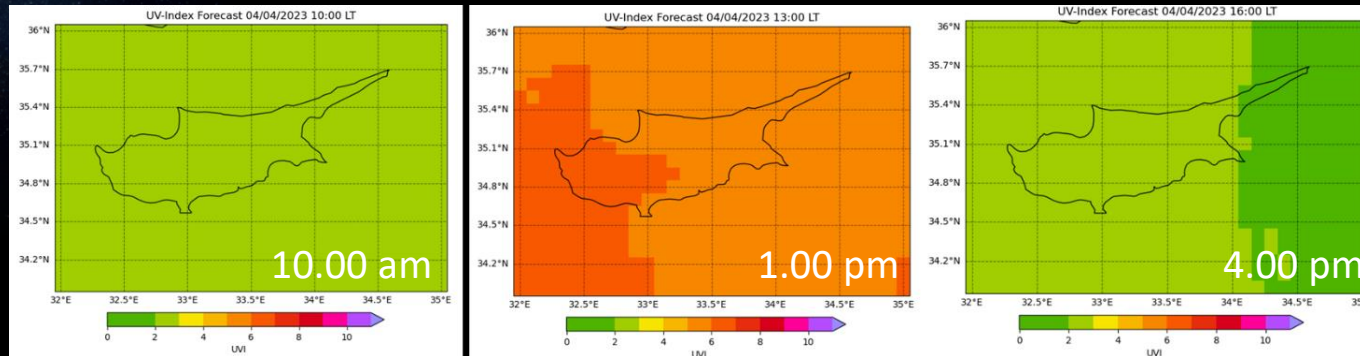
UV-Index in Cyprus



EXPOSURE CATEGORY	UVI RANGE
LOW	< 2
MODERATE	3 TO 5
HIGH	6 TO 7
VERY HIGH	8 TO 10
EXTREME	11+

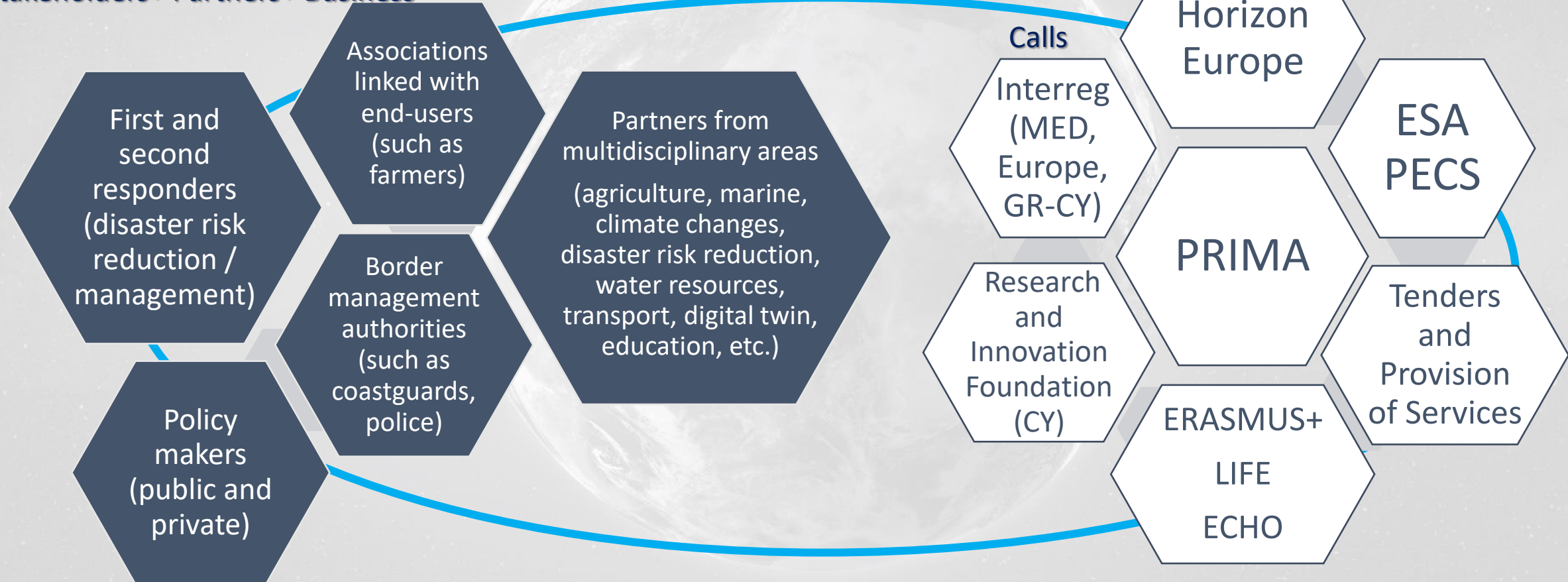


UV-Index forecast over Cyprus on 04-04-2023



Call for collaborations/ Joining Forces!

Stakeholders+ Partner+ Business



Thank you

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