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## EXCELSIOR Project

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Project full title:	<b>ERATOSTHENES: Excellence Research Centre for Earth Surveillance and Space-Based Monitoring of the Environment</b>
Project acronym:	<b>EXCELSIOR</b>
Work Package:	<b>WP1 Project Management and Coordination</b>
Deliverable:	<b>D1.15 Impact Assessment Report for RP 2</b>
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## Executive Summary

This deliverable provides the impact assessment report for RP2 (M16-M30). It provides an update on the overall and specific objectives of the EXCELSIOR project that have been achieved within RP2. This task undertakes the establishment of a methodology for the yearly monitoring of the impact of the different activities carried out by Eratosthenes Centre of Excellence (ECoE) and its partners through EXCELSIOR against a set of quantified targets. The list of Key Performance Indicators established in D1.12 has been revised based on the comments received by the EXCELSIOR project reviewers on 23 June 2021 following the first project review. This list is hereby updated to reflect the activities of RP2. By monitoring the impact for the RP2, it will provide direction of the activities needed to fulfil the KPIs for the following reporting periods. The impact assessment report will be used to assess the implementation of the work plan and adjust the activities in agreement with WP and task Leaders to ensure the achievement of the Project's strategic objectives. WP1 provides the KPI monitoring framework and general quality processes, while the WP3 defines concrete actions affecting all other WPs for meeting the Impact KPIs. This task's activities will be coordinated with WP3 activities on strategy definition as a continuous process, in order to update the human resources, infrastructure acquisition and overall work plan and to meet new priorities identified. The analysis outputs will update the Project Action Plan of Task 1.1.

The following activities were examined and assessed according to the KPIs. These activities include proposals, dissemination events, publications, academia, networks, etc. The impact for each activity was also included.



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## Table of Contents

List of Figures.....	6
List of Tables.....	7
Abbreviations .....	8
1 Introduction.....	9
1.1 Key Performance Indicators .....	9
1.2 Metrics for evaluating impacts.....	10
2 Activities and Impact Assessment for RP2 .....	11
2.1 Infrastructure and equipment.....	11
2.2 Trainings and capacity building activities.....	11
2.3 Research institute networks.....	14
2.4 Calibration/ Validation capacities – Monitoring networks .....	14
2.5 Researchers, administrative and technical staff .....	15
2.5.1 Employment of personnel .....	15
2.5.2 Researchers’ mobility .....	16
2.6 Memoranda of Understanding.....	17
2.7 Professional skills development programs.....	18
2.8 Collaborating networks/institutions .....	18
2.9 Postgraduate students .....	18
2.10 Project proposals, tenders, services, and funding .....	19
2.11 Publications .....	29
2.12 Patents.....	38
2.13 Start-ups and spin-offs .....	39
2.14 Workshops, meetings, and other activities.....	39
3 Measuring Impact through KPIs for RP2 .....	50
4 Overall Impact .....	57
5 Conclusions.....	62
References.....	63
Appendix A .....	67



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## List of Figures

Figure 1: Strategy for measuring impact assessment .....	10
Figure 2: Attendees of seminar titled “Crop Classification using Sentinel Data” provided by NOA .....	12
Figure 3: Attendees of training titled “Earthquakes/Landslides: Training on data processing to ECoE based on the NOA’s workflow for GEObservatory” provided by NOA .....	12
Figure 4: Attendees of training on “Introduction to Earth observation data processing in cloud environments” provided by DLR .....	13
Figure 5: ECoE joined the Associate Partnership Program of ACTRIS IMP .....	14
Figure 6: Internship at the Department of the Environment and Climate of the ECoE .....	16
Figure 7: Memoranda of Understanding signed between ECoE and stakeholders during RP2 .....	18
Figure 8: Research project proposals submitted under national and international calls during RP2...	21
Figure 9: Research projects granted during RP2 .....	21
Figure 10: Partnerships per country during RP2 .....	28
Figure 11: Partnerships per region during RP2 .....	29
Figure 12: ECoE’s publications during RP2 (1/1/2021 – 31/03/2022) .....	32
Figure 13: Publications per ECoE department during RP2 .....	32
Figure 14: Publication types in Environment and Climate department during RP2 .....	33
Figure 15: Publication types in Resilient Society department during RP2 .....	33
Figure 16: Publication types in Big Earth Data Analytics department during RP2 .....	34
Figure 17: ECoE’s Google Scholar profile .....	35
Figure 18: ECoE’s publications citations per year as calculated in Google Scholar (top) and Scopus (bottom) .....	35
Figure 19: ECoE’s h-index as calculated in Scopus .....	36
Figure 20: Participation in international conferences/workshops.....	38
Figure 21: The Second Virtual EXCELSIOR Workshop: "Atmospheric & Climate Research in the EMMENA Region" co-organised by the ECoE on 8 June 2021.....	42
Figure 22: Participants of the 2nd virtual EXCELSIOR Workshop per organisation type .....	42
Figure 23: The 1 <sup>st</sup> CASSINI Space Data Hackathon in Cyprus on 18-20 June 2021.....	43
Figure 24: The Cyprus Launch Event for Horizon Europe on 7 April 2021 .....	43
Figure 25: The MedRIN annual meeting on 25 February 2021 .....	44
Figure 26: Invitations for the invited talks organised by the ECoE during RP2 .....	46
Figure 27: Stakeholders' events organised by the ECoE during RP2.....	47
Figure 28: Participation of the ECoE at the European Researchers' Night 2021 .....	48
Figure 29: Promotion of the ECoE and its activities through press and TV.....	49
Figure 30: SpaceUp Cyprus 2021 LIVE co-organised by the ECoE on CyBC news .....	49
Figure 31: ECoE’s impact on society by the end of RP2 and the goals of EXCELSIOR project.....	57
Figure 32: ECoE’s impact on scientific community by the end of RP2 and the goals of EXCELSIOR project .....	58
Figure 33: ECoE’s impact on participating organisations by the end of RP2 and the goals of EXCELSIOR project .....	58
Figure 34: ECoE’s overall impact by the end of RP2 and the goals of EXCELSIOR project .....	60



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## List of Tables

Table 1: Memoranda of Understanding signed during RP2 .....	17
Table 2: PhD registrations during RP2.....	19
Table 3: Research project proposals submitted during RP2 .....	19
Table 4: Tenders submitted during RP2 .....	22
Table 5: Partnerships through the preparation of research project proposals and tenders .....	23
Table 6: Publications during RP2 .....	29
Table 7: Participation in international conferences/workshops during RP2 .....	36
Table 8: Workshops, meetings, and other activities during RP2 of the EXCELSIOR project .....	39
Table 9: Invited talks organised by the ECoE during RP2 .....	44
Table 10: List of Key Performance Indicators.....	51
Table 11: Current status of KPIs (RP2) and future goals (RP3).....	60



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## Abbreviations

ACTRIS	The Aerosol, Clouds and Trace Gases Research Infrastructure
ACTRIS IMP	ACTRIS Implementation project
BIC	Business Incubation Centre
CAMS	Copernicus Atmosphere Monitoring Service
CCRSS	Concrete Corrosion Remote sensing system
CUT	Cyprus University of Technology
DLR	German Aerospace Centre
DMRID	Deputy Ministry of Research, Innovation and Digital Policy
ECoE	Eratosthenes Centre of Excellence
EMMENA	Eastern Mediterranean, Middle East, and North Africa
EO	Earth Observation
ESA	European Space Agency
EXCELSIOR	Eratosthenes: Excellence Research Centre for Earth Surveillance and Space-based Monitoring of the Environment
FTE	Full-Time Equivalent
GBS	Ground-based Remote Sensing Station
GEE	Google Earth Engine
GEO	Group on Earth Observations
HR	Human Resources
IA	Impact Assessment
IP	Intellectual Properties
KPIs	Key Performance Indicators
MoU	Memorandum of Understanding
NITCA	Novel Integrated Technology for the Characterization of Asphalt
NOA	National Observatory of Athens
PSI	Persistent Scatterer Interferometry
RI	Research Infrastructure
RIF	Research and Innovation Foundation
RP	Reporting Period
RS	Remote Sensing
SCWV	Smart 'CropWATER' Valve





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## 1 Introduction

Impact assessment (IA) involves the assessment of short to long-term actions brought about through the development intervention or series of interventions during the phase or project considered. IA focuses on change and pathways towards change, rather than on activities or deliverables. IA includes:

- determining the nature of impact
- describing activities and potential impacts and,
- the expected magnitude of impact

In addition, it considers the potential for project impacts to combine with other impacts associated with existing or planned developments and the potential for project impacts to extend across national boundaries. Key performance indicators (KPIs), which describe how well a project is achieving its objectives, play a key role in this process. They are an indispensable management tool, allowing monitoring of progress, enabling evidence-based decision-making, and aiding in the development of future strategies. The Key Performance Indicators (KPIs) presented refer to the activities carried out by the Eratosthenes Centre of Excellence (ECoE). On some occasions, double affiliations in meetings, presentations and publications are still present.

### 1.1 Key Performance Indicators

The impacts assessed in this report focus on the future results of the ECoE. In order to measure these impacts, a longitudinal IA will need to be conducted that will require at least a decade to show impact and will not be able to be definitively measured. **Key Performance Indicators (KPIs) are the critical (key) indicators of progress toward an intended result.** They are an indispensable management tool, allowing monitoring of progress, enabling evidence-based decision-making, and aiding in the development of future strategies. As well, they can also significantly contribute to the successful communication of results and achievements, and thus to the financial sustainability of institutions, as well as to increased transparency. KPIs provide a focus for strategic and operational improvement, create an analytical basis for decision making and help focus attention on what is most important. Essentially, KPIs are quantifiable measures used to evaluate the success of an organization in meeting objectives for performance. Once a KPI is defined, methods of measuring and assessing performance need to be defined and carried out in practice. Often, the assessment needs to be broken down into segments, quantified within the desired time frame and are consistently measured and assessed.

KPIs play a key role in the evaluation of socio-economic return of the expected impacts of the ECoE. KPIs provide the measure against which impact is assessed. Therefore, if KPIs are not met, the objectives and goals need to be re-examined to see the extent to which they are unable to meet the KPIs set out for that particular objective or goal. Throughout the ECoE, it is expected that the KPIs will need to be modified due to the combination of objectives and impacts. As a result, the EXCELSIOR project, in anticipation of challenges that may arise, has included tasks in order to ensure the validity and effectiveness of the Impact KPIs.

Following the first general project review and the consolidated review report (Ref. Ares(2021)4082008) received on 23 June 2021, the initial separation of KPIs in Research, Innovation and Economic impact



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categories, was modified, as it was recommended to showcase the impact at three different levels, such as:

- Impact at the level of participating organisations
- Impact at the level of the related scientific community
- Impact at societal level at large

Based on that, the list of KPIs was revised, new KPIs were added in the original list, some KPIs were modified in terms of description and/or metric used, and all KPIs were re-arranged in the new impact categories, as shown in detail in *Table 10*. All KPIs will be re-evaluated, and corrective actions will take place if impacts in the three aforementioned categories are not met. What were considered acceptable KPIs with workable goals and impacts in the beginning of the program may not be as realistic as they were prior to the commencement of the ECoE.

## 1.2 Metrics for evaluating impacts

The practice of IA relies upon a family of instruments and tools in order to predict future expected consequences of possible decisions. Depending on the level of effort and significance with which the process is undertaken, different degrees of success are achieved. Also important to the success of IA is the process of follow-up, which assures that recommendations of the IA are implemented and effective.

The appropriate impact metrics can differ significantly, depending on the purpose of the evaluation. IA creates the key dashboard for sustainability; therefore, it is vital to choose an assessment approach that will generate information consistent with its intended use. The goal of IA measurement is to deliver insights to inform strategy and improve program effectiveness (*Figure 1*).

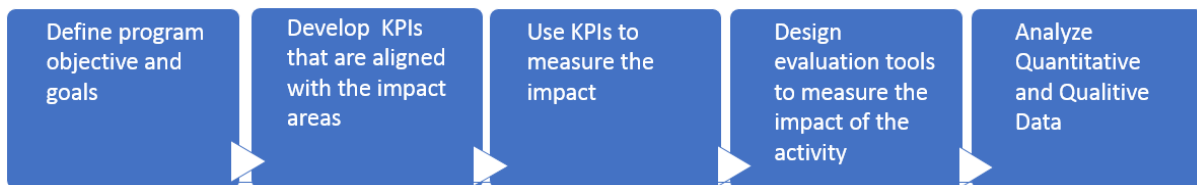


Figure 1: Strategy for measuring impact assessment



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## 2 Activities and Impact Assessment for RP2

To determine the impact of the newly established ECoE using the KPIs for RP2, information is provided on the activities that were completed during the period between M16 and M30 (RP2). The impact at the level of participating organisations, at the level of the related scientific community and at societal level at large, are presented and analysed in detail along with other supporting information to quantify the KPIs, as listed in Table 2.1 of the Grant Agreement. Direct reference in the following sections of this chapter, is provided to the various Key Performance Indicators listed in *Table 10*.

### 2.1 Infrastructure and equipment

KPI **P01** refers to the acquisition of all necessary equipment for the operation of the Centre of Excellence, that are essential to conduct cutting-edge research and create applications through a satellite ground receiving station, a Ground-based atmospheric remote sensing station (GBS), that is a supersite for aerosol and cloud monitoring as well as all other equipment that are essential to conduct cutting-edge research and thus be more competitive in receiving research proposals and creating tailor-made applications for stakeholders.

For a more efficient monitoring of the progress of the activities, this indicator is divided into three parts, **P01a** for the satellite ground receiving station, **P01b** for the supersite for aerosol and cloud monitoring and **P01c** for all other equipment (e.g. geodetic equipment, sensors, spectroradiometers, etc.).

During RP2, the specifications for the **satellite ground receiving station** were being prepared by CUT, with the assistance of DLR, to issue the tender (approximately in two months). Moreover, regarding the establishment of a **supersite for aerosol and cloud monitoring** (GBS), the tender was issued, and the results/prices are expected by end of February 2022. Finally, discussions and market research were carried out for the purchase of all **other equipment**.

### 2.2 Trainings and capacity building activities

During RP2, **three (3) capacity building activities (P02a)** were carried out in total by two of the EXCELSIOR project advanced partners, the National Observatory of Athens (NOA) and the German Aerospace Centre (DLR). They were all carried out through the Microsoft Teams online conferencing tool. Overall, **5.07 person-months (P02b)** were allocated by the ECoE in these three capacity building activities. It is important to highlight that, due to the delay in the approval and signing of the contract amendment, and in order to avoid any further delays, the coordinator informed the project officer that the CUT researchers would sign a contract with the ECoE in order to be eligible to attend the trainings.

On 22, 23, 24 and 26 November 2021, NOA organised and carried out a Seminar on “Crop Classification using Sentinel Data”, which included theory and hands-on sessions, using Sentinel data, Python, and basic/advanced crop classification algorithms. The specific seminar was related to the Environment & Climate Department of the Eratosthenes Centre of Excellence and, more specifically, the agriculture sector. The total duration of the seminar was 16 hours in total over all four (4) days, with 27 researchers attending it, either as full participants or as observers. Overall, 3.01 person-months were allocated by the ECoE to this activity.



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Figure 2: Attendees of seminar titled “Crop Classification using Sentinel Data” provided by NOA

Moreover, on 1-3 February 2022, NOA carried out a second training activity titled “Earthquakes/Landslides: Training on data processing to ECoE based on the NOA’s workflow for GEObservatory” to personnel of the Resilient Society Department of the ECoE and, more specifically, its Disaster Risk Reduction sector. It provided basic SAR background knowledge in the form of presentations and hands-on application of SAR image pre-processing in ISCE software and Persistent Scatterer Interferometry (PSI) technique using StaMPS through NOA’s GEObservatory. Based on the seminar’s agenda, its total duration was 6 hours in total over all three (3) days, with 23 researchers attending it. Overall, 0.96 person-months were allocated by the ECoE to this activity.

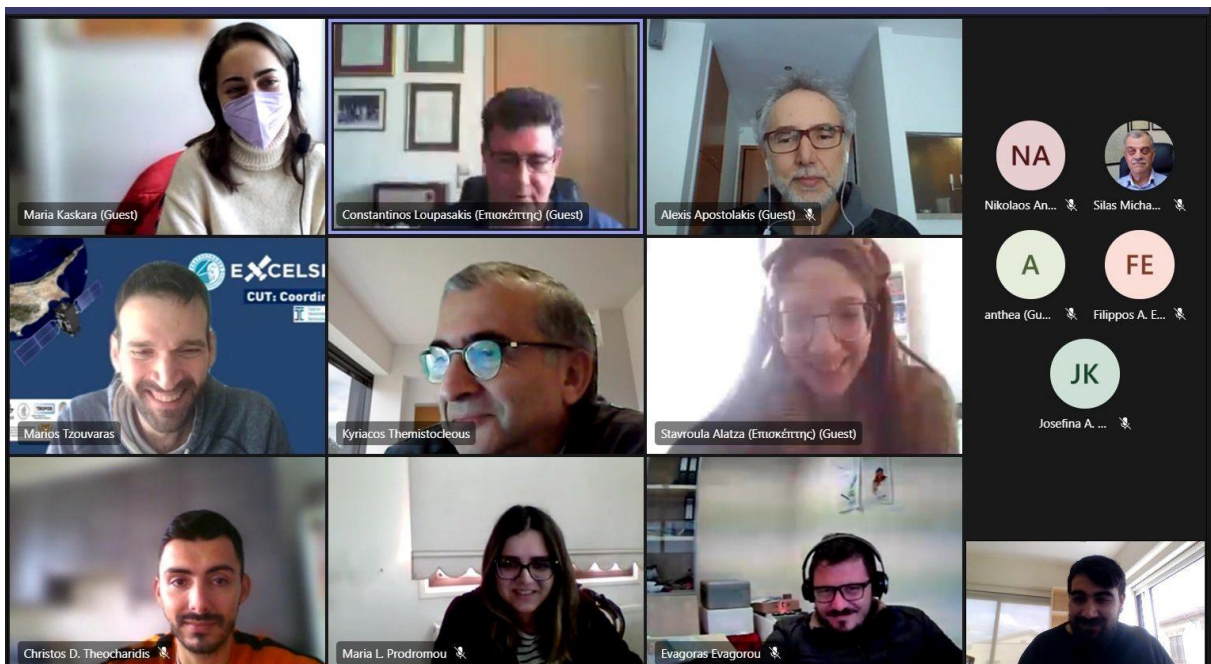


Figure 3: Attendees of training titled “Earthquakes/Landslides: Training on data processing to ECoE based on the NOA’s workflow for GEObservatory” provided by NOA



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Last, on 9 February 2022, DLR carried out their first training on “Introduction to Earth observation data processing in cloud environments”. It provided basic background knowledge on the principles of Earth Observation data processing in cloud environments along with relevant examples, an introduction to Google Earth Engine (GEE) and hands-on training on GEE using java scripts for data import, image filtering, data visualisation, etc. as well as advanced training on water reservoir mapping with SAR data and on vegetation/drought mapping with NDVI time series. The specific activity was oriented towards the needs of the Big Earth Data Analytics Department of the ECoE and at the same time was useful for personnel involved in the Environment & Climate Department of the ECoE. The total duration of the seminar was 5.25 hours over one (1) day, with 30 researchers attending it. Overall, 1.1 person-months were allocated by the ECoE to this activity.

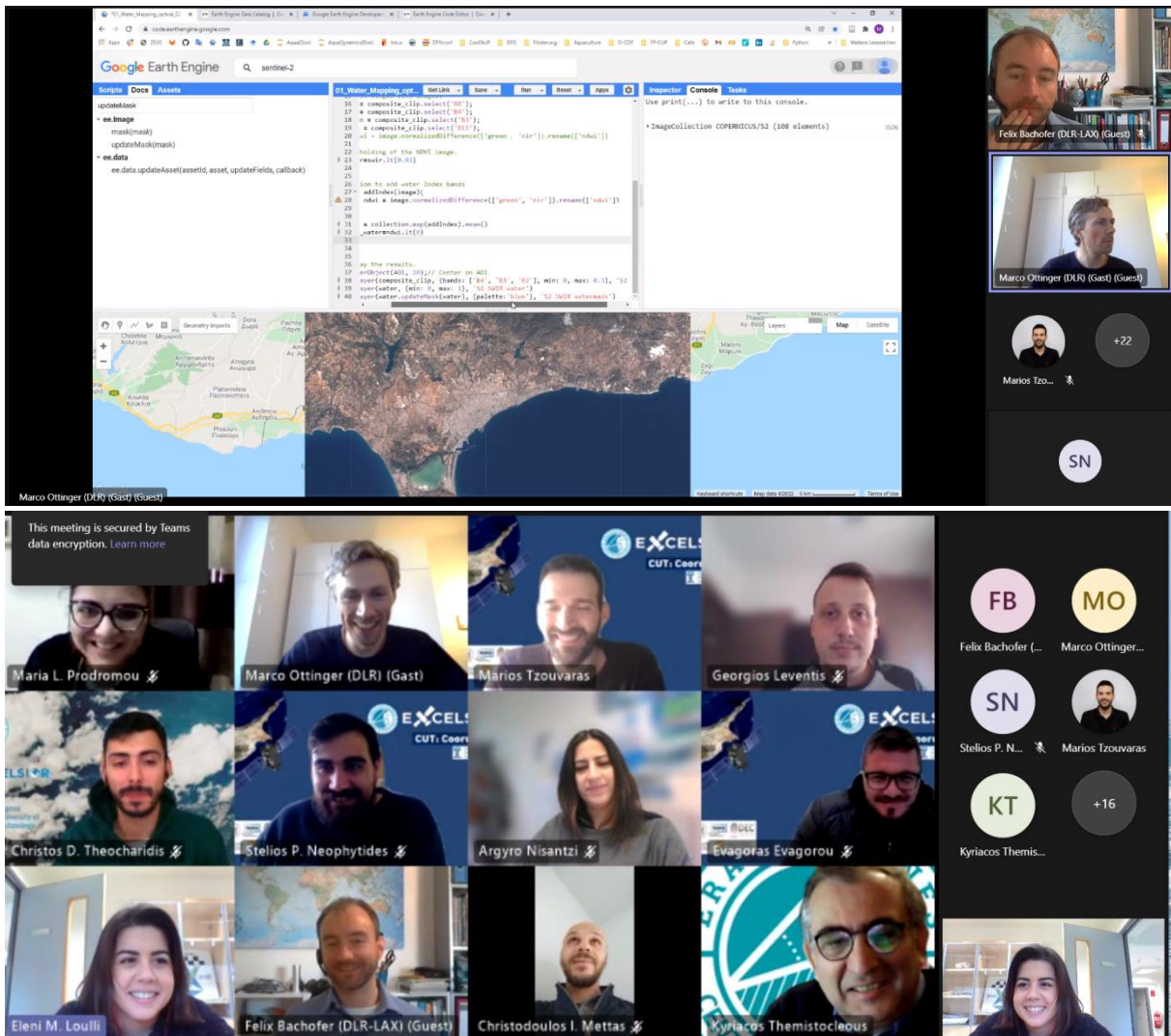


Figure 4: Attendees of training on “Introduction to Earth observation data processing in cloud environments” provided by DLR

As the ECoE and the capacity building activities are still at an early stage, there were **no people participating in demonstration projects (P02c)** during RP2.



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## 2.3 Research institute networks

In this section, the research institute networks that the ECoE is either in the process of joining or has already joined are presented in detail along with the status of the ECoE. During RP2, the **ECoE did not join any RI networks (P03)** but is in the process of joining various networks, such as the Copernicus Academy, the Cluster for EO (European Commission), the Astronomical society, IEEE GRSS, EaRSEL, NEREUS, ISPRS.

## 2.4 Calibration/ Validation capacities – Monitoring networks

Through the participation of the ECoE in EARLINET and PollyNET networks during RP1, the PollyXT-CYP system of the ECoE, in collaboration with TROPOS, participates in a pilot NRT provision of ACTRIS/EARLINET lidar-derived aerosol optical properties profiles to the Copernicus Atmosphere Monitoring Service<sup>1</sup> (CAMS). The pilot data provision began in October 2020 at the test site in Potenza, and, in January 2021, the data provision started for a group of 9 stations located over Europe; thus, it is considered as representative for the entire ACTRIS/EARLINET network.

Moreover, the PollyXT-CYP as part of the PollyNET, participates in the German initiative for experimental Aeolus validation. Aeolus was launched on 22 August 2018 by the European Space Agency (ESA) and is the first direct detection Doppler wind lidar into space. Operating at 355 nm and acquiring signals with a dual channel receiver, it allows wind observations in clear air and particle-laden regions of the atmosphere. Measuring with 87km horizontal and 0.25-2km vertical resolution between ground and up to 30km in the stratosphere, the global coverage of Aeolus observations shall fill gaps in the global observing system and thus help improving numerical weather prediction.

During RP2 of the EXCELSIOR Phase 2 project, on 29 March 2021, the ERATOSTHENES Centre of Excellence (of the Cyprus University of Technology) joined the Associate Partnership Program of ACTRIS-IMP<sup>2</sup>. ECoE’s application was approved by the ACTIS Steering Committee during the general assembly of the Spring ACTRIS IMP meeting (*Figure 5*).

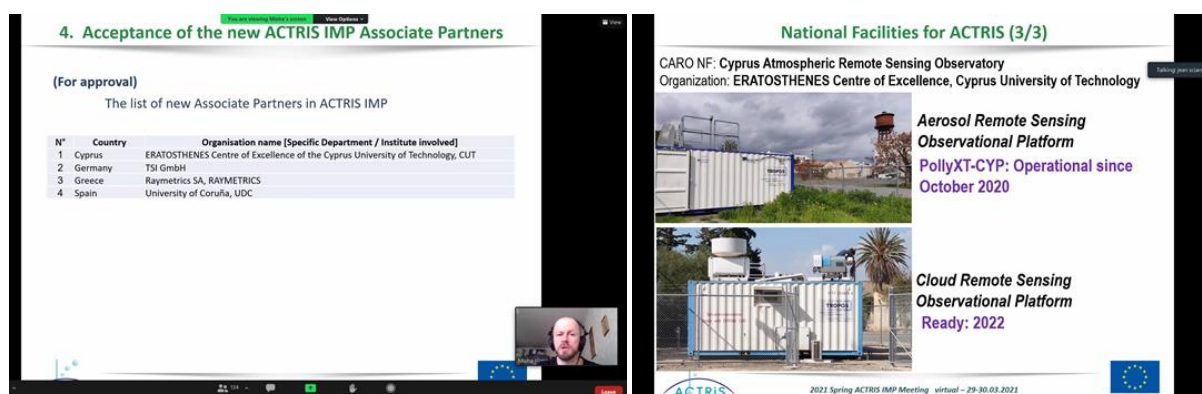


Figure 5: ECoE joined the Associate Partnership Program of ACTRIS IMP

<sup>1</sup> Copernicus Atmosphere Monitoring Service: <https://atmosphere.copernicus.eu/>

<sup>2</sup> ACTRIS IMP Associate Partnership Programme: <https://www.actris.eu/associate-partnership-programme>



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The Associate Partners are expected to participate actively in ACTRIS IMP and strengthen the voice of ACTRIS data originators and ACTRIS service users. The participation of the ECoE as Associate Partner acts as a channel to participate and affect the shaping of the future research infrastructure ACTRIS. The Associate Partners, who signed the Confidentiality Agreements, contribute their expertise to the project's objectives and benefit from the activities undertaken within the project. Overall, the ECoE have joined **1 monitoring network (ACTRIS) (P04)** as a step towards creating and utilising a world-class calibration and validation centre.

On 2 June 2021, the ECoE signed a letter of commitment (see *Appendix A*) expressing its concrete commitment to cover the "Operation Support" part of the contribution for the ACTRIS membership for the period 2021-2025, as well as for the full operational phase from 2026 and beyond, corresponding to the National Facilities operating under the ECoE, and more specifically, the Cyprus Atmospheric Remote Sensing Observatory (CARO) at the Cyprus University of Technology / ERATOSTHENES Centre of Excellence. The ECoE has already evidenced clear commitment towards providing tangible support towards the ACTRIS Membership. A provision of an annual contribution of the ERATOSTHENES OF EXCELLENCE to the Research Infrastructure (ACTRIS) has been approved by the Executive Committee of the ECoE based on the recommendation of our strategic partner TROPOS and the strategic activities that are stated at the EXCELSIOR H2020 TEAMING PROJECT Grant Agreement (G.A 857510). The aforementioned co-funding will provide Cyprus the opportunity to be part of this strategic EU Research Infrastructure and to advance knowledge transfer and enhance collaboration in the field.

## **2.5 Researchers, administrative and technical staff**

### **2.5.1 Employment of personnel**

The ECoE has planned to attract and employ high calibre research and technical staff, offering a dynamic environment for basic and applied research in EO. Following the employment of fifteen researchers and academic staff (3.06 FTE) on a part-time basis from CUT and the appointment of the ECoE Management Board, consisting of 12 people, during RP1, additional research and administration staff were employed through the 24 job announcements<sup>3</sup> for researchers, administrative and technical staff.

More specifically, 87 job applications were received, from which 16 candidates were invited to interviews. Overall, 13 job offers were made, leading to 7 new employments, i.e., 2 administrative staff, 1 technical staff and 4 researchers/scientific staff. From the 7 new employments, 3 people, 1 research staff and 2 administrative (the Human Resources (HR) Manager and an Accounting and Financial Officer) started working at the ECoE during RP2. The rest will start work during RP3. Moreover, 1 contract is currently under review, whereas 5 job offers were not accepted. Furthermore, following interviews, 4 people, 2 in administrative and 2 in research positions, agreed to be transferred from Cyprus University of Technology to the ERATOSTHENES Centre of Excellence, and started work during RP2.

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<sup>3</sup> ECoE open positions: <https://eratosthenes.org.cy/open-positions/>



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Following the formal completion of the contract amendment of the EXCELSIOR project, **3 researchers** were employed by the Eratosthenes Centre of Excellence during RP2 (**P05a**). In total, **7 researchers and technical/administrative personnel** were employed, with the salaries paid until the end of RP2 (31 March 2022) being **€48,973 (S01)**. Moreover, **14.3%** of them were attracted from abroad (**S02**), and more specifically from Greece.

Another goal of the ECoE is to host researchers (MSC fellows, European Research Council grants ERC, etc.) to increase the exchange of ideas, develop knowledge transfer and capacity building, in various sectors of EO. More specifically, there are plans to host 4 MSC fellows by year 4 of the project. However, in RP2, the number of MSC Fellows, European Research Council grants, etc. that are hosted at the ECoE is **0 (P05b)**.

### 2.5.2 Researchers' mobility

During RP2, **no personnel from external organisations visited and/ or used the ECoE facilities and no ECoE personnel was seconded to other organisations (SC05)** in Cyprus or abroad. A secondment of one of our researchers, Ms Eleni Loulli, to TROPOS was planned, but unfortunately due to COVID-19, it was cancelled (tickets paid).

However, in March and April 2021, an undergraduate student of Energy and Environmental Engineering at Tampere University of Applied Sciences in Finland, visited the ECoE to undertake an internship at the Department of Environment and Climate. During his internship, he worked with the team of Atmosphere supervised by Dr Rodanthi Elisavet Mamouri. His work was focused on the identification of the main air pollution sources in Cyprus, more specifically the air pollution from industrial and anthropogenic activities. Additionally, he had the opportunity to visit the Atmospheric Remote Sensing Facilities at CUT and ECoE, where he became familiar with the remote sensing techniques and experimental processes and examined the potential to continue his studies by pursuing an MSc in Remote Sensing through ECoE. His internship at the ECoE gave us the opportunity to establish new links with a Northern European University.



Figure 6: Internship at the Department of the Environment and Climate of the ECoE

Moreover, in March 2022, another undergraduate student of Energy and Environmental Engineering at Tampere University of Applied Sciences in Finland, started her internship at the Department of Environment and Climate of the ECoE. During her internship, she will collaborate with the team of Agriculture supervised by Dr Christiana Papoutsas. Based on the background and the interests of the





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student, her work will be focused on the classification of the main crop types that are cultivated in Cyprus such as wheat, barley, triticale, and potatoes. She will also have the opportunity to collaborate with the team members of the ECoE, Dr Christiana Papoutsas, Dr Michalakis Christoforou, Mr Stelios Neophytides, and Ms Maria Prodromou on the integration of remotely sensed and in-situ data such as Sentinel satellite images, UAV captures and field spectroradiometric measurements to support the identification and classification of the main crops cultivated in Cyprus. Furthermore, during her internship, she will also have the opportunity to work on Crop Yield Estimation and other applications of Earth Observation on Agriculture.

## 2.6 Memoranda of Understanding

The ECoE, in order to strengthen the relationship with national and international stakeholders in the Earth Observation domain has signed **16 Memoranda of Understanding (MoU)** with stakeholders from governmental departments, public authorities, academia, research organisations and Industry (*Table 1*). **12 MoU** were signed **with local/national public and private organisations (P06a)** and **4 MoU** were signed **with international public and private organisations (P06b)**. Moreover, 5 MoU are under preparation with governmental departments, research organisations, universities, and private companies.

Table 1: Memoranda of Understanding signed during RP2

#	Name	Type	Country	Date
1	Cyprus Energy Regulatory Authority	Public entity	Cyprus	19/02/2021
2	H2020 ERA Chair “Mnemosyne”, Cyprus University of Technology	Academia/Research	Cyprus	19/03/2021
3	University Forest Administration and Management Fund, Aristotle University of Thessaloniki	Academia/Research	Greece	29/03/2021
4	Limassol Chamber of Commerce and Industry	Private entity	Cyprus	05/04/2021
5	Municipality of Kato Polemidia/ Ecclesiastical Committee of Panagia Evaggelistria, Holy Bishopric of Limassol	Public entity	Cyprus	15/04/2021
6	Norwegian Geotechnical Institute	Private entity	Norway	10/05/2021
7	Cyprus Research and Innovation Center Ltd	Private entity	Cyprus	10/05/2021
8	AI MOTUS Ltd	Private entity	Cyprus	14/05/2021
9	CELLOCK LTD	Private entity	Cyprus	14/05/2021
10	University of Malta	Academia	Malta	19/07/2021
11	Geofem	Private entity	Cyprus	27/07/2021
12	University Politecnico di Milano	Academia	Italy	17/11/2021
13	T.C. Geomatic Ltd	Private entity	Cyprus	28/02/2022
14	NOVATEX SOLUTIONS LTD	Private entity	Cyprus	28/02/2022
15	ECECT - EUROPEAN CENTRE FOR EMERGING COMPETENCIES AND TECHNOLOGIES	Private entity	Cyprus	28/02/2022





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successfully defended his PhD thesis titled “Asphalt Pavement Condition Assessment using Remote Sensing Techniques” on 29 June 2021.

Table 2: PhD registrations during RP2

#	Research area	Gender	PhD supervisor	Semester
1	Earth Observation in resilient society/Digital Twins	M	Diofantos Hadjimitsis	1 <sup>st</sup>
2	Spatial Analysis in Palaeobiogeography	M	Phaedon Kyriakidis	1 <sup>st</sup>
3	Earth Observation for Cultural Heritage	F	Athos Agapiou	1 <sup>st</sup>
4	Open-Pit Quarries Management using GNSS and SAR Techniques	M	Chris Danezis	2 <sup>nd</sup>
5	GNSS Interference Detection and Localization	M	Chris Danezis	2 <sup>nd</sup>
6	Earth Observation in Agriculture	F	Diofantos Hadjimitsis	3 <sup>rd</sup>
7	Earth Observation in Floods	F	Diofantos Hadjimitsis	3 <sup>rd</sup>
8	Earth Observation in Marine/Maritime Sciences (with DLR co-supervision)	F	Diofantos Hadjimitsis	3 <sup>rd</sup>
9	Scenario-Based Land Use Forecasting for Crop Yield	M	Phaedon Kyriakidis	3 <sup>rd</sup>
10	Earth Observation in Land use/land cover	F	Diofantos Hadjimitsis	3 <sup>rd</sup>

There are **18 MSc students** attending the two MSc courses offered by the Department of Civil Engineering and Geomatics (CUT); i.e. the MSc in Civil Engineering and Sustainable Design and the MSc in Geoinformatics and Geospatial Technologies, that use the RI and facilities of the CUT/ECOE for their thesis. From a total of **28 postgraduate (MSc and PhD) students (P09a)**, one is from Greece, i.e., constituting **3.57%** of the total number of students (**P09b**).

## 2.10 Project proposals, tenders, services, and funding

In this section, the research project proposals that were submitted and/or started during RP2, i.e., 1 January 2021 – 31 March 2022, are presented in *Table 3* below. Additionally, the funding received from these projects, the partnerships formed with the Industry and the public sector, the tenders submitted, and the services developed by the ECOE during RP2, are presented in detail.

Table 3: Research project proposals submitted during RP2

#	Funding source	Date submitted	Starting date	Project acronym	ECOE budget (€)	Coordinator / Partner	Funded
1	PRIMA	13-04-2021	-	SOS4Soil	658,622.31	Coordinator	No
2	PRIMA	13-04-2021	-	Reduce_Olive_Waste	312,000.00	Partner	No
3	A.G. LEVENTIS	28-05-2021	Pending	APLIKI	1,000.00	Partner	Yes
4	A.G. LEVENTIS	28-05-2021	Pending	Laona tumulus	0.00	Partner	Yes
5	A.G. LEVENTIS	28-05-2021	01-02-2022	GRAMIC	0.00	Partner	Yes
6	European Civil Protection and Humanitarian Aid Operations (ECHO)	08-06-2021	-	HAZ-GAUGE	148,826.35	Coordinator	No



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#	Funding source	Date submitted	Starting date	Project acronym	ECoE budget (€)	Coordinator / Partner	Funded
7	Cyprus Research and Innovation Foundation (RIF)	02-07-2021	-	GeoActSim	108,952.00	Coordinator	No
8	RIF	02-07-2021	-	AQUA4ALL	185,339.00	Coordinator	No
9	RIF	02-07-2021	-	DEFOTHERM	156,173.85	Coordinator	No
10	RIF	02-07-2021	-	INTEGRATE	166,390,00	Coordinator	No
11	RIF	02-07-2021	-	COPERNICUS-CH	200,000.00	Coordinator	No
12	RIF	02-07-2021	-	EPOCA	0.00	Partner	No
13	RIF	02-07-2021	01-04-2022	MIGRATE	2.889,60	Partner	Yes
14	RIF	02-07-2021	-	ASPASIA	190,000.00	Coordinator	No
15	RIF	02-07-2021	-	FIRE-DANGER	142,599.80	Coordinator	No
16	ESA-PECS	31-08-2021	-	EVCTEMON	35,395.00	Partner	No
17	ESA-PECS	31-08-2021	-	Sen4LANDRISK	125,154.00	Coordinator	No
18	ESA-PECS	31-08-2021	Pending	EDAFOS	67,000.00	Partner	Yes
19	CRIF	17-09-2021	-	REINVENT	39,911.68	Coordinator	No
20	PRIMA	21-09-2021	Pending	AGREEMAR	174,500.00	Partner	Yes
21	Horizon Europe	06-10-2021	-	MAS-DRONES	550,000.00	Partner	No
22	Horizon Europe	07-10-2021	-	FairTex	301,163.00	Partner	No
23	Horizon Europe	23-11-2021	-	CRISEES	473,750.00	Coordinator	Pending
24	Horizon Europe	23-11-2021	-	MARATHON	279,375.00	Partner	Pending
25	Horizon Europe	23-11-2021	-	SIMPLEBORDERS	118,125.00	Partner	Pending
26	LIFE	30-11-2021	-	Life-Reclaim	147,211.00	Partner	Pending
27	Horizon Europe	18-01-2022	-	AI-OBSERVER	615,653.00	Coordinator	Pending
28	Horizon Europe	18-01-2022	-	RESILIENCE	134,572.00	Partner	Pending
29	Horizon Europe	18-01-2022	-	UPSCALE	106,250.00	Partner	Pending
30	Horizon Europe	18-01-2022	-	ENGINEER	132,500.00	Partner	Pending
31	DIGITAL	22-02-2022	-	CYDIHUB-EDIH	73,295.00	Partner	Pending
32	Horizon Europe	23-02-2022	-	SARCASA	119,500.00	Partner	Pending
33	Horizon Europe	09-03-2022	-	COASTLINE	200,000.00	Partner	Pending
34	Horizon Europe	15-03-2022	-	CARBONICA	674,000.00	Partner	Pending
35	Horizon Europe	15-03-2022	-	VitiWineHub	255,625.00	Partner	Pending
36	PRIMA	22-03-2022	-	SOS4Soil	129,652.55	Coordinator	Pending

**Thirty-six (36) project proposals were submitted for funding (P10a)** until the end of the RP2, budgeted for ECoE's involvement at €6,856,145.54. These were submitted in various national and international calls for funding, as shown in *Figure 8* below.



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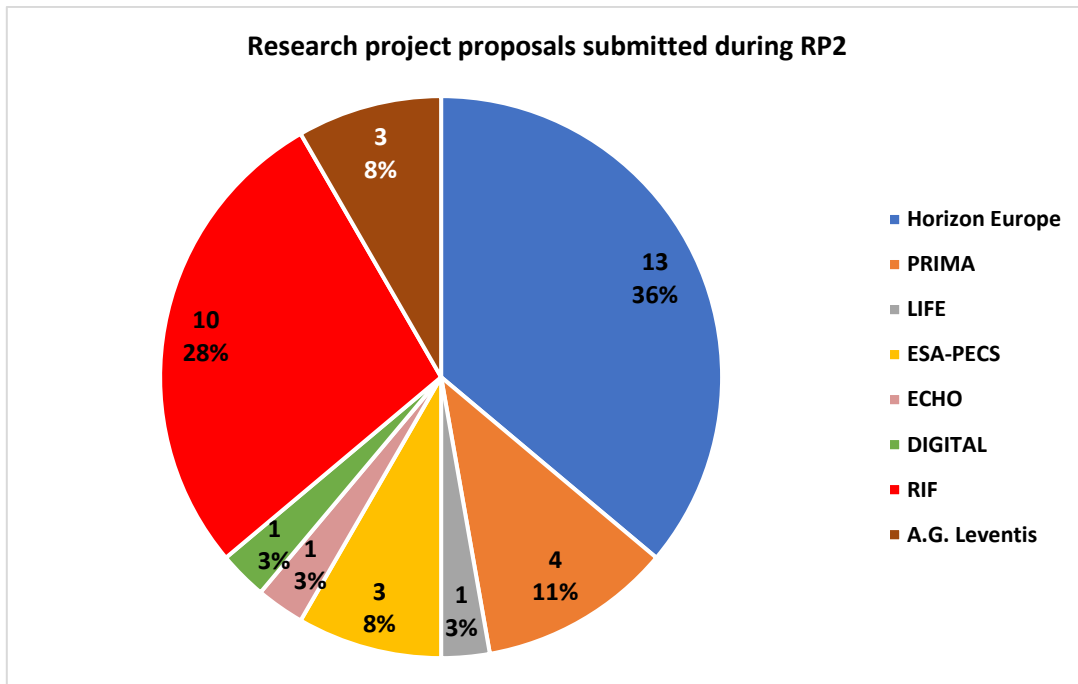


Figure 8: Research project proposals submitted under national and international calls during RP2

From these proposals, **six (6) research project proposals (P10b)** were granted, receiving funding from A.G. Leventis (3), PRIMA (1), ESA-PECS (1) and RIF (1), as presented in *Figure 9*, with an overall budget of **€245,389.60 (P10c)** for ECoE. However, the decision for 14 proposals is still pending, with these having a total budget of €3,459,508.55 for the ECoE.

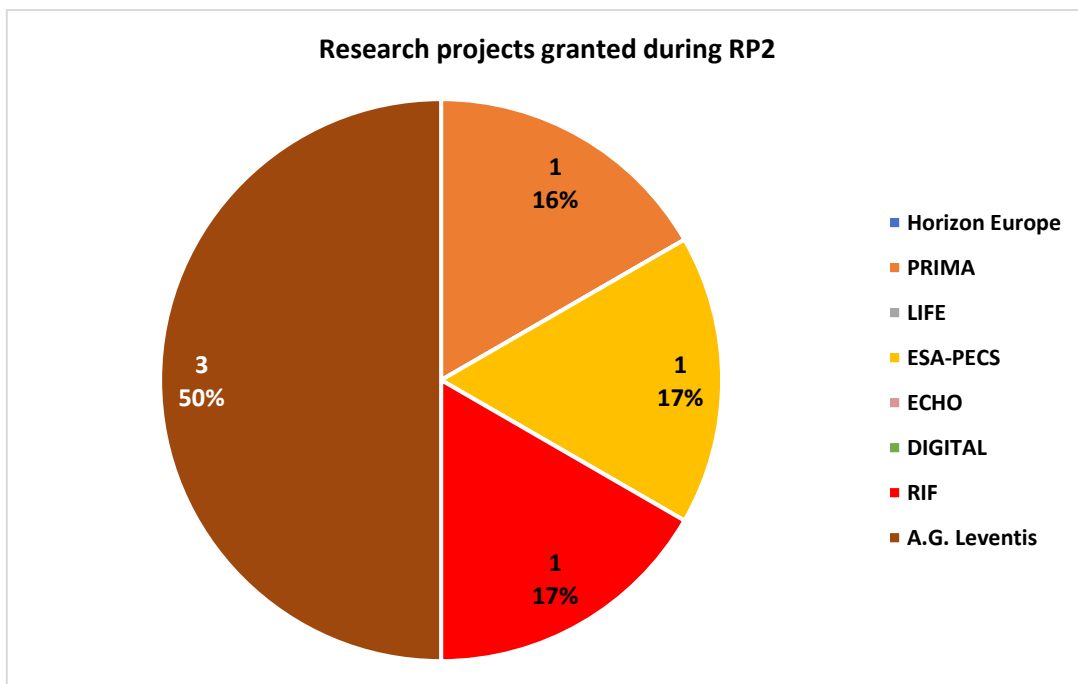


Figure 9: Research projects granted during RP2



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During RP2, the ECoE also participated in the submission of three international tenders for services to European agencies, competing against consortia consisting of international key players. The tender for the European Maritime Safety Agency (EMSA) was not funded, whereas the results for the other two tenders are still pending. Moreover, the ECoE has submitted a proposal for the development of services that will be used by public authorities and governmental departments in Cyprus. This proposal was successfully awarded to the ECoE by the Department of Forests<sup>6</sup> (Ministry of Agriculture, Rural Development and Environment) for the provision of remote sensing services by the ECoE for the classification of trees in various areas in Cyprus using mainly satellite imagery. Furthermore, ECoE was granted another tender by ARISTO Developers for a geophysical overview using ground penetrating radar. Therefore, **2 services** have been developed for the needs of public authorities and Industry (**S05**). All the above are presented in detail in *Table 4*.

Table 4: Tenders submitted during RP2

#	Contracting authority	Date submitted	Subject of tender	ECoE budget (€)	Funded
1	Department of Forests, Cyprus	23/11/2020 (Started on 12/02/2021)	Remote Sensing services	70,000	Yes
2	ARISTO Developers	06/08/2021 (delivered 24/01/2022)	Geophysical overview using ground penetrating radar	15,000	Yes
3	European Maritime Safety Agency (EMSA)	23/11/2021	EMSA/OP/13/2021: Development and Maintenance Services for the Earth Observation Data Centre	*	No
4	European Commission, DG EUROSTAT	15/12/2021	ESTAT/LUX/2021/OP/0014: Supply of Services to Support the Geographical Information Systems for the Commission (GISCO)	*	Pending
5	European Union Satellite Centre (SatCen)	02/02/2022	SATCEN-OP-03/21: Production and supply of geospatial products for the Copernicus Service in Support to EU External Action component of the Copernicus Security Service	*	Pending
*Percentage to the number of services provided for these authorities (The total value of each tender cannot be disclosed here due to confidentiality)					

Partnerships with **208 stakeholders** from public authorities, governmental departments, ministries, academia, and research organisations, as well as with the industry and the private sector in general, have been achieved through the submission of research proposals and/or tenders, in which the aforementioned organisations and agencies are part as members of the proposal consortia. These are presented below in *Table 5*.

<sup>6</sup> Department of Forests: [http://www.moa.gov.cy/moa/fd/fd.nsf/index\\_en/index\\_en?OpenDocument](http://www.moa.gov.cy/moa/fd/fd.nsf/index_en/index_en?OpenDocument)



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Table 5: Partnerships through the preparation of research project proposals and tenders

#	Organisation name	Organisation type	Country
1	University of Pavia	University	Italy
2	CELLOCK Ltd	Private company	Cyprus
3	Suez Canal University	University	Egypt
4	Ben Gurion University of the Negev	University	Israel
5	Aristotle University of Thessaloniki	University	Greece
6	Spin Life srl	Private company	Italy
7	Piante Acqua Natura srl	Private company	Italy
8	Foundation for Research and Technology Hellas	Research organisation	Greece
9	The Hashemite University	University	Jordan
10	National Agricultural Research Center of Jordan	Research organisation	Jordan
11	University Sultan Moulay Slimane	University	Morocco
12	National Agronomic Institute of Tunisia	Research organisation	Tunisia
13	SQLI Services	Private company	Tunisia
14	TUBITAK Marmara Research Center	Research organisation	Turkey
15	University of Cyprus	University	Cyprus
16	Cornell University	University	USA
17	KU Leuven	University	Belgium
18	Cyprus Institute	Research organisation	Cyprus
19	University Politecnico di Milano	University	Italy
20	Paris I Panthéon-Sorbonne	University	France
21	Trinity College Dublin	University	Ireland
22	University of Helsinki	University	Finland
23	European University Cyprus	University	Cyprus
24	Cyprus Civil Defence, Ministry Of Interior	Public authority	Cyprus
25	L.D. TECHNOLOGIES LTD	Private company	Cyprus
26	Frederick Research Center	Research organisation	Cyprus
27	University of Brighton	University	UK
28	Geofem	Private company	Cyprus
29	Ministry of Transport, Communications and Works	Public authority	Cyprus
30	Universita degli studi di Siena	University	Italy
31	Ministry of Agriculture, Rural Development and Environment	Public authority	Cyprus
32	Flinders University	University	Australia
33	Department of Forests, Ministry of Agriculture, Rural Development and Environment	Public authority	Cyprus
34	300,000 trees in Limassol	Association/ Society	Cyprus
35	California State University	University	USA
36	NASA	Research organisation	USA
37	Department of Lands and Surveys, Ministry of Interior	Public authority	Cyprus
38	Norwegian Geotechnical Institute	Private company	Norway
39	Cyprus Geological Survey Department, Ministry of Agriculture, Rural Development and Environment	Public authority	Cyprus
40	Atlantis Consulting	Private company	Cyprus



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#	Organisation name	Organisation type	Country
41	Department of Environment, Ministry of Agriculture, Rural Development and Environment	Public authority	Cyprus
42	Technical University of Dresden	University	Germany
43	adelphi research gGmbH	Research organisation	Germany
44	Universitat Politecnica de Valencia	University	Spain
45	Laboratorio Nacional de Engenharia Civil	Research organisation	Portugal
46	University of Seville	University	Spain
47	Fundación Andaluza para el Desarrollo Aeroespacial, Centro Avanzado de Tecnologías Aeroespaciales	Research organisation	Spain
48	German Research Center for Artificial Intelligence	Research organisation	Germany
49	Università Degli Studi di Torino	University	Italy
50	VVA Brussels Sprl	Private company	Belgium
51	AGRI-CIÊNCIA - Consultores de Engenharia	Private company	Portugal
52	Telespazio Italia	Private company	Italy
53	E-GEOS SPA (AFFILIATED ENTITY of TPZIT)	Private company	Italy
54	TerraSphere Imaging & GIS B.V.	Private company	Netherlands
55	POBAR Servicios Agrícolas, S.L.	Private company	Spain
56	Telespazio France	Private company	France
57	Graphics Vision	Private company	Germany
58	farmB digitizing agriculture	Private company	Greece
59	Institute Agricole Regional	University	Italy
60	Stuttgart Media University/ CREAM & Start-up Center	University	Germany
61	Steinbeis Europa Zentrum / Steinbeis 2i GmbH	Private company	Germany
62	Reutlingen University	University	Germany
63	Prague University of Economics & Business	University	Czech Republic
64	Lottozero società cooperativa sociale	Private company	Italy
65	Anagnorisis Institute of Media Management LTD	Private company	Cyprus
66	Chamber of Commerce and Industry of Slovenia	Public authority	Slovenia
67	The Municipality Of Pegeia	Public authority	Cyprus
68	Ianus Consulting Ltd	Private company	Cyprus
69	Telesto Technologies Pliroforikis Kai Epikoinonion Epe	Private company	Greece
70	Universiteit Antwerpen	University	Belgium
71	Zentrum Fur Risiko- Und Krisenmanagement	Private company	Austria
72	Technische Universitaet Wien	University	Austria
73	Dimos Egaleo	Public authority	Greece
74	Berufsfeuerwehr Linz	Public authority	Austria
75	T4i Engineering Single Member Private Company	Private company	Greece
76	Zukunftsforum Öffentliche Sicherheit	Association/ Society	Germany
77	Haifa Municipality	Public authority	Israel
78	University Of Haifa	University	Israel
79	Istituto Di Sociologia Internazionale Di Gorizia	University	Italy
80	Geospatial Information Technologies P.c.	Private company	Greece
81	Landeshauptstadt Innsbruck	Public authority	Austria
82	Omada Ethelonton Dasopyrosveston Diasoston	Public authority	Greece
83	Escola Nacional De Bombeiros	University	Portugal





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#	Organisation name	Organisation type	Country
84	Signalgenerix Limited	Private company	Cyprus
85	University of Western Macedonia	University	Greece
86	Prepared International UG	Private company	Germany
87	Anysolution SL	Private company	Spain
88	Institute of Meteorology and Water management National Research Institute	Research organisation	Poland
89	Imaginary SRL	Private company	Italy
90	Institut Jozef Stefan	Research organisation	Slovenia
91	Kuhne Logistics University GGMBH	University	Germany
92	Entente pour la Foret Mediterranee	Research organisation	France
93	RMA "Maritza"	Public authority	Bulgaria
94	Decentralized Administration of Epirus-Western Macedonia	Public authority	Greece
95	Agenzia Regionale LAORE Sardegna	Public authority	Italy
96	Comunidad Autonoma Islas Baleares	Public authority	Spain
97	Institute of Information and Communication and Technologies	University	Bulgaria
98	Obshtina Topolovgrad	Public authority	Bulgaria
99	Trilateral Research Limited	Research organisation	Ireland
100	Elliniko Mesogeiaiko Panepistimio	University	Greece
101	Ethniko Kentro Erevnas kai Technologikis Anaptyxis	Research organisation	Greece
102	IDEMIA Identity & Security France	Private company	France
103	Future Intelligence Ltd	Private company	UK
104	Chief Directorate Border Police	Public authority	Bulgaria
105	K3Y	Private company	Bulgaria
106	University of West Attica	University	Greece
107	Cyprus Police	Public authority	Cyprus
108	Fundacion Valencia Port	Research organisation	Spain
109	Balearia Eurolineas Maritimas SA	Private company	Spain
110	Hellenic Police	Public authority	Greece
111	Center for Security Studies KEMEA	Research organisation	Greece
112	iSolutions LLC	Private company	Ukraine
113	Administration of the State Border Guard Service of Ukraine	Public authority	Ukraine
114	Thales DIS SRO	Private company	Czech Republic
115	Spanish Police, Ministry of Interior	Public authority	Spain
116	University of Rome Tor Vergata	University	Italy
117	Instituto Superior Tecnico	Research organisation	Portugal
118	The University of Sheffield	University	UK
119	Karlsruhe Institute of Technology	University	Germany
120	University College London	University	UK
121	Politecnico Di Bari	University	Italy
122	Terra Marine	Private company	Greece
123	AegeanSolutions	Private company	Greece
124	IN2IT	Private company	Italy
125	Agricultural Research Institute, Ministry of Agriculture, Rural Development and Environment	Public authority	Cyprus



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#	Organisation name	Organisation type	Country
126	Cyprus Digital Innovation Hub LTD	Private company	Cyprus
127	Frederick University	University	Cyprus
128	RTD Talos Limited	Private company	Cyprus
129	GrantExpert Consulting Limited	Private company	Cyprus
130	Archi Psifiakis Asfaleias	Public authority	Cyprus
131	Open University of Cyprus	University	Cyprus
132	AKTI Project and Research Centre	Research organisation	Cyprus
133	Cyprus Business Angels Network Ltd	Private company	Cyprus
134	Educational Excellence Corporation	Private company	Cyprus
135	Cyprus Blockchain Technologies LTD	Private company	Cyprus
136	Neapolis University	University	Cyprus
137	European Office of Cyprus	Association/ Society	Cyprus
138	Gravity Ventures LTD	Private company	Cyprus
139	Cyprus Information Technologies Enterprises Association	Association/ Society	Cyprus
140	Center of Interdisciplinary Science Promotion and Innovative Research Exploration, UCLAN Cyprus	Research organisation	Cyprus
141	Cyprus Computer Society	Association/ Society	Cyprus
142	Computer Resources International Group	Private company	Belgium
143	Geosystems Hellas	Private company	Greece
144	InterBalkan Environment Centre	Research organisation	Greece
145	University of Thessaly	University	Greece
146	Koinopraxia Synetairismou-Omadon Paragogon Nomou Imathias	Association/ Society	Greece
147	Agrotikos Synetairismos Neapolis Agriniou	Association/ Society	Greece
148	Chios Mastiha Research Center SA	Research organisation	Greece
149	Ministry of Environment, Energy and Climate Change	Public authority	Greece
150	MILITOS SYMVOULEUTIKI A.E.	Private company	Greece
151	COGNITERA S.A.	Private company	Greece
152	Agrotikos Synetairismos Stebia Ellas	Association/ Society	Greece
153	Organismos Pliromon Ke Eleghou Kinotikon Enishyseon Prosanatolismou Keegyiseon	Public authority	Greece
154	KOOLMILL Systems Limited	Private company	UK
155	NOVEL GROUP SARL	Private company	Luxembourg
156	Universite De Ngoundere	University	Cameroon
157	European Business And Innovation Centre Network AISBL	Association/ Society	Belgium
158	Carbone Fertile - Centre National D'Agroécologie	Association/ Society	France
159	PyroGenesys	Private company	UK
160	Sociedade Portuguesa De Inovacao Consultadoria Empresarial E Fomento Da Inovacao SA	Association/ Society	Portugal
161	Universite De Liege	University	Belgium
162	Université du Burundi	University	Burundi
163	Institut De Recherches Agronomiques Et Forestieres	Research organisation	Gabon
164	Institut De Recherche Agricole Pour Le Developpement	Research organisation	Cameroon
165	Universite De Kinshasa	University	Congo
166	STRATAGEM Energy Ltd	Private company	Cyprus



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#	Organisation name	Organisation type	Country
167	World Vegetable Center	Association/ Society	Benin
168	SENSEEN	Private company	France
169	GREENHOUSE Ventures Ltd	Private company	Cameroon
170	Technische Universiteit Eindhoven	University	Netherlands
171	Biome Makers Spain S.L.	Private company	Spain
172	Zentrum Fur Soziale Innovation Gmbh	Research organisation	Austria
173	Institut Centrafricain de la Recherche Agronomique	Research organisation	Central African Republic
174	Ministry of Agriculture and Rural Development	Public authority	Central African Republic
175	Ecole Nationale Superieure D Agronomie Et De Foresterie	University	Congo
176	Ministère de l'Environnement, de l'Agriculture et de l'Elevage	Public authority	Burundi
177	Ministère du developpement agricole	Public authority	Chad
178	Institut Tchadien de Recherche Agricole pour le Développement	Research organisation	Chad
179	Ministère de l'Agriculture, de l'Élevage et de la Pêche de la République du Congo	Public authority	Congo
180	Association Congolaise pour le Développement Agricole	Association/ Society	Congo
181	International Institute of Tropical Agriculture	Research organisation	Nigeria
182	Ministère de l'Agriculture et du Développement Rural	Public authority	Cameroon
183	Ministère de l'Agriculture, de la Pêche et de l'Elevage de la République Démocratique du Congo	Public authority	Congo
184	Ministere de l'Agriculture, de l'Elevage, de la Pêche et de l'Alimentation	Public authority	Gabon
185	Universite De Geneve	University	Switzerland
186	REM Analytics SA	Private company	Switzerland
187	FOODSCALE HUB Greece Association For Entrepreneurship And Innovation	Association/ Society	Greece
188	SCIENTACT AE	Private company	Greece
189	AgFutura Technologies	Private company	North Macedonia
190	Green Growth Platform	Association/ Society	North Macedonia
191	Macedonian National Extension Agency	Public authority	North Macedonia
192	University "Goce Delchev", Shtip	University	North Macedonia
193	Hellenic Accreditation System	Public authority	Greece
194	Panagrotikos Syndesmos Kyprou Somateio	Association/ Society	Cyprus
195	Universidade de Trás-os-Montes e Alto Douro	University	Portugal
196	Regia-Douro Park - Parque de Ciência e Tecnologia	Private company	Portugal
197	Fraunhofer Portugal	Research organisation	Portugal
198	Associação para o Desenvolvimento da Viticultura Duriense	Association/ Society	Portugal
199	Association of Port Wine Companies	Association/ Society	Portugal
200	Fundação da Casa de Mateus	Association/ Society	Portugal
201	Águas do Norte, S.A	Private company	Portugal



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#	Organisation name	Organisation type	Country
202	Sociedade Portuguesa de Inovação	Association/ Society	Portugal
203	Software Imagination & Vision SRL	Private company	Romania
204	Research and Development Institute for Viticulture and Enology Valea Calugareasca	Research organisation	Romania
205	Asociatia Cluster mAGRO	Association/ Society	Romania
206	Agency for Payments and Intervention in Agriculture	Public authority	Romania
207	Viile Budureasca SRL	Private company	Romania
208	Direção Regional de Agricultura e Pescas do Norte	Public authority	Portugal

During RP2, in the framework of the preparation and submission of the research project proposals, presented earlier, the ECoE has closely collaborated with 85 universities and research organisations in Cyprus (9) and abroad (76), **39 stakeholders from public authorities (S06)** in Cyprus (11) and abroad (28), and **63 stakeholders from Industry (S07)** in Cyprus (15) and abroad (48). Moreover, ECoE partnered with 21 associations/societies from Cyprus (5) and abroad (16) in some research project proposals. All the above have assisted in the formation of strong partnerships between the ECoE and the public sector, Academia, and Industry. The distribution of these stakeholders internationally is presented in *Figure 10* below.

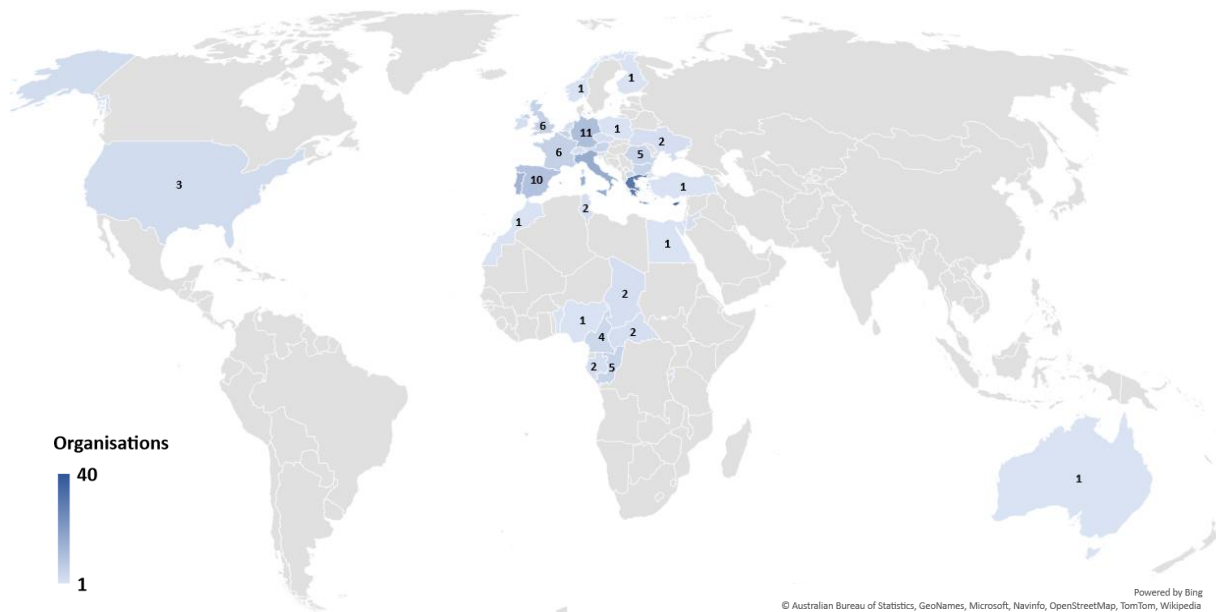


Figure 10: Partnerships per country during RP2

In the region of Eastern Mediterranean, Middle East, and North Africa (EMMENA), that is the ECoE's main area of focus, ECoE has partnered with 81 organisations (public authorities, private companies, and academia/research) from Cyprus (40), Egypt (1), Greece (31), Israel (3), Jordan (2), Morocco (1), Tunisia (2) and Turkey (1). The ECoE partnered with 104 organisations from different European countries, 19 from other African countries, 3 from USA and 1 from Australia (*Figure 11*).



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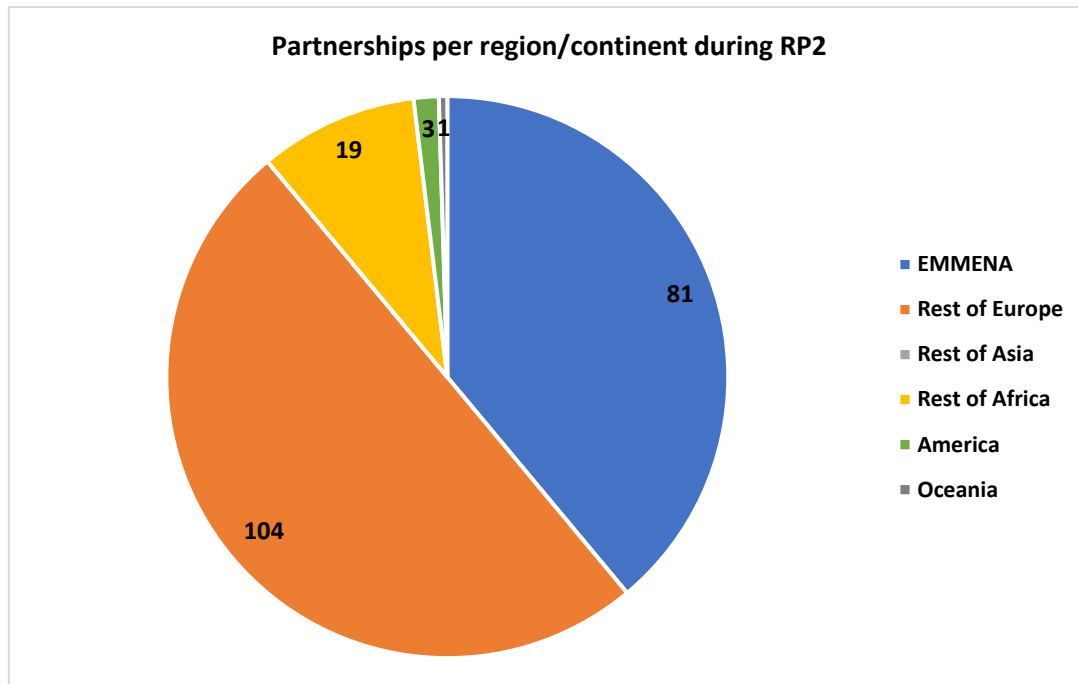


Figure 11: Partnerships per region during RP2

## 2.11 Publications

Overall, 54 publications, from which 31 are open-access, were carried out by researchers of the ERATOSTHENES Research Centre/ECOE during RP2. A full list of the publications in the form of citations is provided in *Table 6* below, together with the date of publication, the publication type, and the journal or conference they were published in.

Table 6: Publications during RP2

#	Citation	Date of publication	Publication type	Journal/ Conference/ Book
1	(Melios <i>et al.</i> , 2021)	01-01-2021	Conference paper	12 <sup>th</sup> Mediterranean Conference on Power Generation, Transmission, Distribution and Energy Conversion (MEDPOWER 2020)
2	(Miltiadou, Campbell, <i>et al.</i> , 2021)	04-02-2021	Journal paper	Remote Sensing
3	(Tsioulou <i>et al.</i> , 2021)	05-02-2021	Conference paper	IABSE Congress: Resilient technologies for sustainable infrastructure
4	(Popov <i>et al.</i> , 2021)	06-02-2021	Journal paper	Remote Sensing Applications: Society and Environment
5	(Morsy, Scholten, <i>et al.</i> , 2021)	07-02-2021	Journal paper	Remote Sensing
6	(Agapiou, 2021a)	08-03-2021	Journal paper	Sensors



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#	Citation	Date of publication	Publication type	Journal/ Conference/ Book
7	(Agapiou, Lysandrou and Cuca, 2021)	09-03-2021	Conference paper	9 <sup>th</sup> International Congress & 3rd GEORES - GEOmatics and pREServation
8	(Neocleous, Polydorou and Pilakoutas, 2021)	01-04-2021	Book chapter	Tire Waste and Recycling
9	(Gravanis <i>et al.</i> , 2021)	01-04-2021	Journal paper	Physica A: Statistical Mechanics and its Applications
10	(Kassianidou, Agapiou and Manning, 2021)	05-04-2021	Journal paper	Antiquity
11	(Melillos and Hadjimitsis, 2021)	12-04-2021	Conference paper	Automatic Target Recognition XXXI, SPIE
12	(Hadjimitsis <i>et al.</i> , 2021)	14-04-2021	Conference paper	8 <sup>th</sup> International Euro-Mediterranean Conference (EuroMed 2020)
13	(Makri <i>et al.</i> , 2021)	14-04-2021	Conference paper	8 <sup>th</sup> International Euro-Mediterranean Conference (EuroMed 2020)
14	(Cerra <i>et al.</i> , 2021)	14-04-2021	Conference paper	8 <sup>th</sup> International Euro-Mediterranean Conference (EuroMed 2020)
15	(Georgiou, Philokyprou and Themistocleous, 2021)	14-04-2021	Conference paper	8 <sup>th</sup> International Euro-Mediterranean Conference (EuroMed 2020)
16	(Papageorgiou and Hadjimitsis, 2021)	14-04-2021	Conference paper	8 <sup>th</sup> International Euro-Mediterranean Conference (EuroMed 2020)
17	(Vakkari <i>et al.</i> , 2021)	19-04-2021	Journal paper	Atmospheric Chemistry and Physics
18	(Christodoulou, Pantelidis and Gravanis, 2021)	01-05-2021	Journal paper	Archives of Computational Methods in Engineering
19	(Gravanis, Akylas and Livadiotis, 2021)	04-05-2021	Journal paper	Journal of Statistical Mechanics: Theory and Experiment
20	(Katicas <i>et al.</i> , 2021)	08-05-2021	Journal paper	Applied Energy
21	(Agapiou, 2021b)	01-06-2021	Journal paper	Heritage Science
22	(Fountoulakis <i>et al.</i> , 2021)	13-06-2021	Journal paper	Remote Sensing
23	(Milidonis <i>et al.</i> , 2021)	19-06-2021	Journal paper	Solar Energy
24	(Cuca and Agapiou, 2021)	22-06-2021	Journal paper	Sustainability
25	(Martins-neto <i>et al.</i> , 2021)	23-06-2021	Journal paper	Remote Sensing
26	(Ansmann <i>et al.</i> , 2021)	29-06-2021	Journal paper	Atmospheric Chemistry and Physics Discussions
27	(Agapiou and Lysandrou, 2021)	02-07-2021	Journal paper	Sensors
28	(Kyriakidis <i>et al.</i> , 2021)	05-07-2021	Conference paper	AGILE: GIScience series
29	(Agapiou, 2021c)	22-07-2021	Journal paper	Land
30	(Polykretis <i>et al.</i> , 2021)	27-07-2021	Journal paper	Big Earth Data
31	(Saponaro <i>et al.</i> , 2021)	15-08-2021	Journal paper	Remote Sensing
32	(Miltiadou, Antoniou and Theocharidis, 2021)	25-08-2021	Journal paper	Forests
33	(Mazi, Akylas and Koussis, 2021)	08-09-2021	Journal paper	Hydrogeology Journal



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#	Citation	Date of publication	Publication type	Journal/ Conference/ Book
34	(Evagorou, Mettas and Hadjimitsis, 2021)	12-09-2021	Conference paper	Remote Sensing of the Ocean, Sea Ice, Coastal Waters, and Large Water Regions (SPIE Remote Sensing)
35	(Themistocleous, 2021)	12-09-2021	Conference paper	Earth Resources and Environmental Remote Sensing/GIS Applications XII (SPIE Remote Sensing)
36	(Themistocleous and Anayiotos, 2021)	12-09-2021	Conference paper	Earth Resources and Environmental Remote Sensing/GIS Applications XII (SPIE Remote Sensing)
37	(Eliades, Hadjimitsis and Danezis, 2021)	12-09-2021	Conference paper	Remote Sensing for Agriculture, Ecosystems, and Hydrology XXIII (SPIE Remote Sensing)
38	(Gravanis and Akylas, 2021)	15-09-2021	Journal paper	Physica A: Statistical Mechanics and its Applications
39	(Tzouvaras, 2021)	13-10-2021	Journal paper	Sensors
40	(Morsy, Taghizadeh-Mehrjardi, <i>et al.</i> , 2021)	22-10-2021	Journal paper	Remote Sensing
41	(Moutsiou <i>et al.</i> , 2021)	27-10-2021	Journal paper	PLoS ONE
42	(Hadjipetrou <i>et al.</i> , 2022)	10-11-2021	Journal paper	Renewable Energy
43	(Miltiadiou, Theocharidis, <i>et al.</i> , 2021)	01-12-2021	Conference paper	SilviLaser Conference 2021
44	(Radenz <i>et al.</i> , 2021)	08-12-2021	Journal paper	Atmospheric Chemistry and Physics
45	(Alexakis <i>et al.</i> , 2021)	10-12-2021	Journal paper	Remote Sensing
46	(Agapiou, Vionis and Papantoniou, 2021)	10-12-2021	Journal paper	Land
47	(Zinonos <i>et al.</i> , 2022)	23-12-2021	Journal paper	IEEE Access
48	(García-Ayllón and Kyriakidis, 2022)	05-01-2022	Journal paper	Land
49	(Escribano <i>et al.</i> , 2022)	14-01-2022	Journal paper	Atmospheric Chemistry and Physics
50	(Polydorou <i>et al.</i> , 2022)	14-01-2022	Book chapter	Handbook of Sustainable Concrete and Industrial Waste Management
51	(Evagorou <i>et al.</i> , 2022)	07-02-2022	Journal paper	Remote Sensing
52	(Fotiou <i>et al.</i> , 2022)	14-02-2022	Journal paper	Remote Sensing
53	(Andronis <i>et al.</i> , 2022)	18-02-2022	Journal paper	Remote Sensing
54	(Kakoullis <i>et al.</i> , 2022)	20-02-2022	Journal paper	Remote Sensing

These 54 publications consist of **37 journal papers (SC01)**, **15 conference papers (SC02)** and 2 book chapters, as shown in *Figure 12*.



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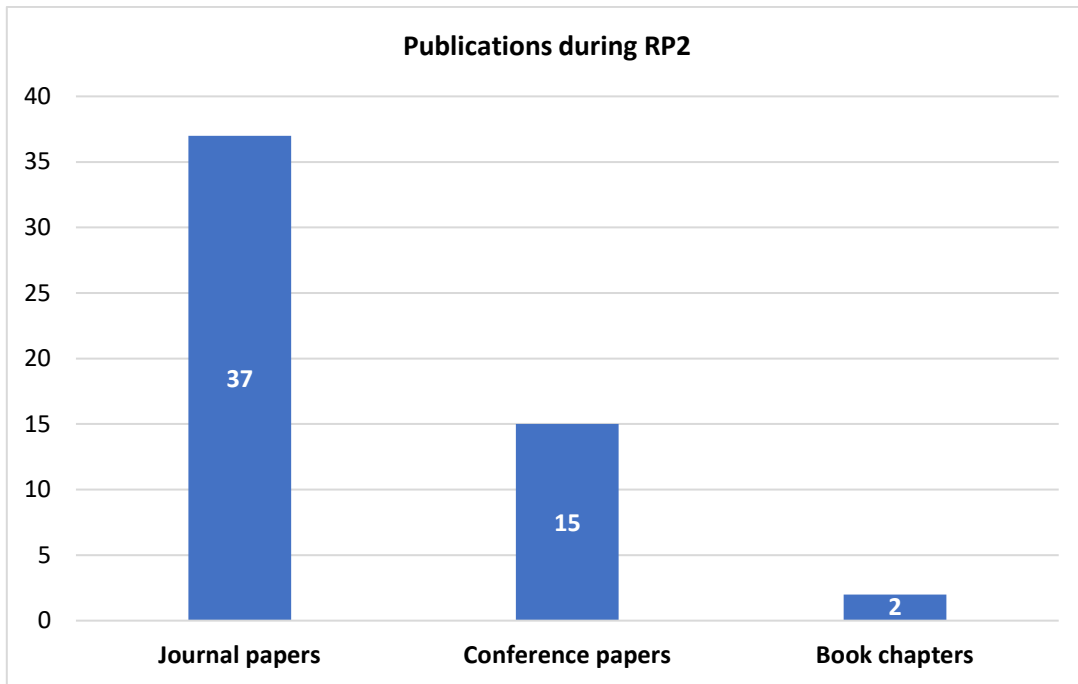


Figure 12: ECoE's publications during RP2 (1/1/2021 – 31/03/2022)

The aforementioned publications fall under the various ECoE's departments (*Figure 13*), where the majority of them (27) belong to the Resilient Society department, while 25 are linked to the Environment and Climate department and the remaining 2 are focused on Big Earth Data Analytics.

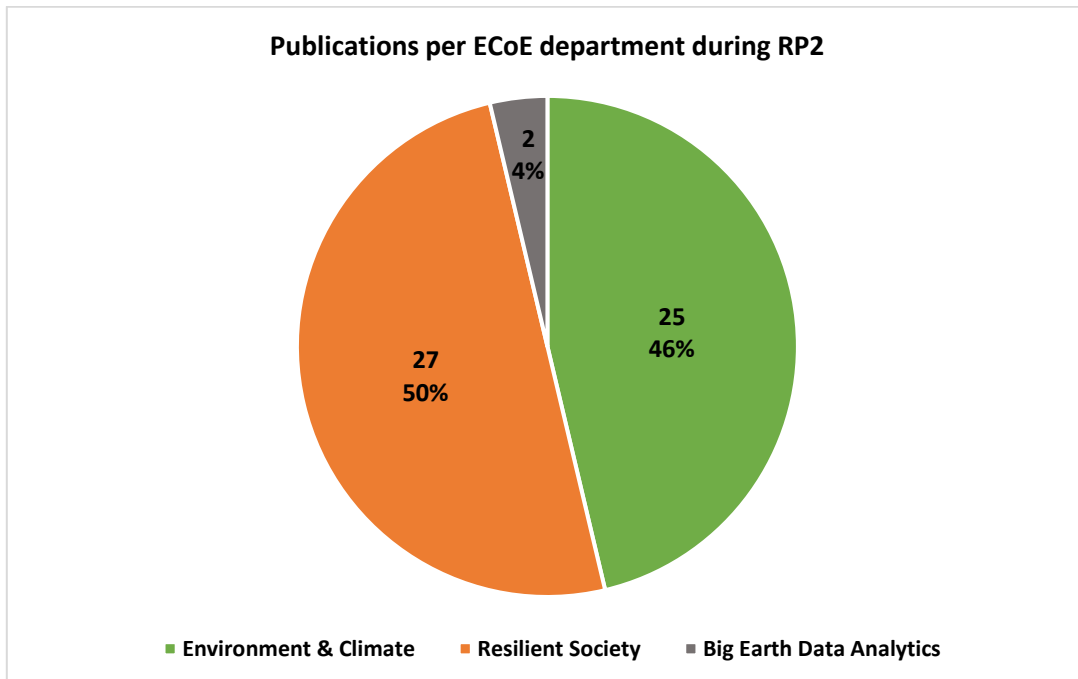


Figure 13: Publications per ECoE department during RP2





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A more thorough analysis sheds light on the type of publication per research department. As far as the Environment and Climate department is concerned (*Figure 14*), most of the publications are journal papers (22), whereas 3 conference papers and no book sections were published during RP2.

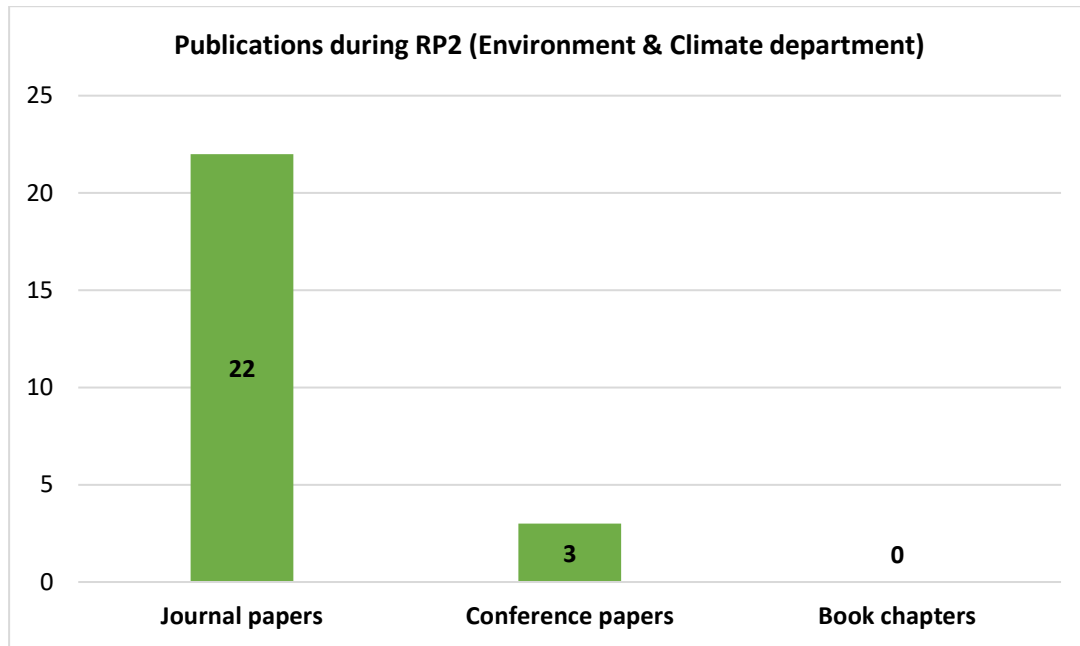


Figure 14: Publication types in Environment and Climate department during RP2

In contrast to the previous figure, where the journal papers outnumbered the conference papers, the 27 publications of the Resilient Society department are distinguished into 13 journal papers, 12 conference papers and 2 book chapters, as shown in *Figure 15* below.

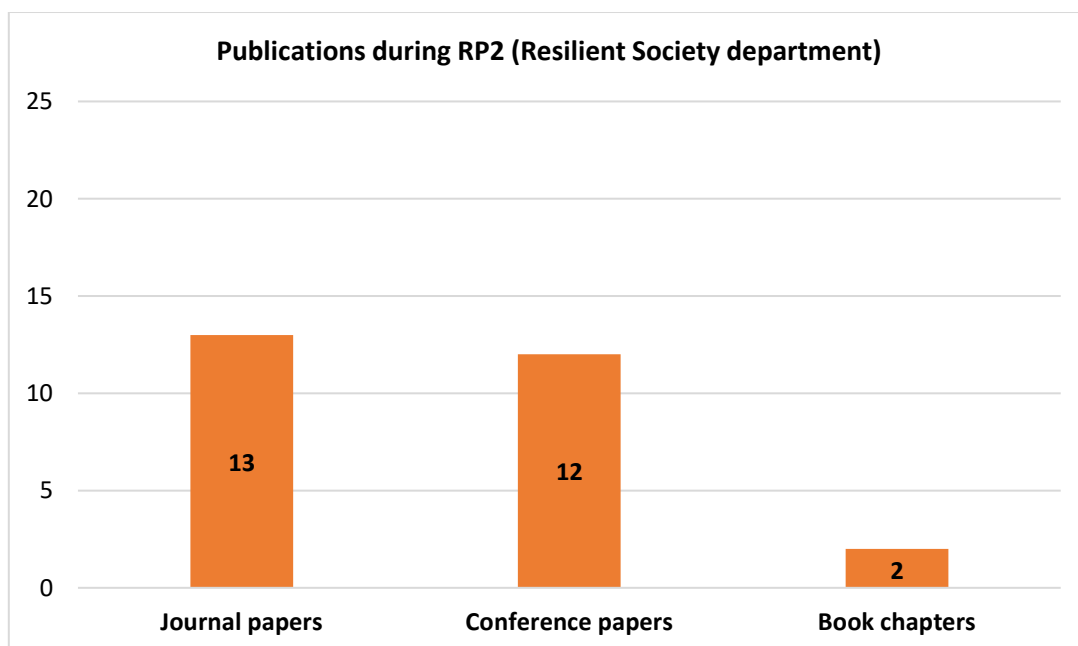


Figure 15: Publication types in Resilient Society department during RP2



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In the Big Earth Data Analytics department, as seen in *Figure 16*, there are 2 journal publications, whereas no conference papers or book chapters have been published during RP2.

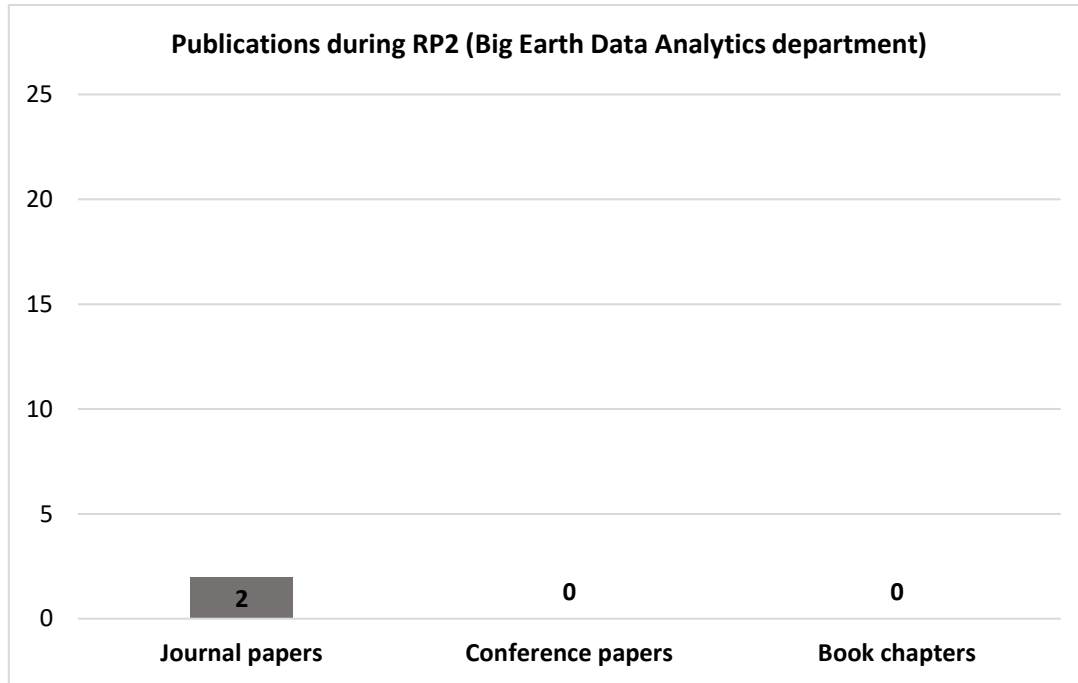


Figure 16: Publication types in Big Earth Data Analytics department during RP2

Scopus<sup>7</sup> and Google Scholar<sup>8</sup> were used to calculate the grouped h-index and the citations during RP2. To calculate these statistics from Scopus and Google Scholar, the following 33 researchers were grouped: Prof. Diofantos Hadjimitsis, Prof. Phaedon Kyriakidis, Prof. Andreas Anayiotos, Prof. Evangelos Akylas, Dr Chris Danezis, Dr Nicholas Kyriakides, Dr Silas Michaelides, Dr Kyriacos Themistocleous, Dr Kyriacos Neocleous, Dr Rodanthi-Elisavet Mamouri, Dr Athos Agapiou, Dr Elias Gravanis, Dr Constantinos Panagiotou, Dr Argyro Nisantzi, Dr Christiana Papoutsas, Dr Vasiliki Lysandrou, Dr Thomaida Polydorou, Dr George Melillos, Dr Milto Miltiadou, Dr Marios Tzouvaras, Dr Christodoulos Mettas, Mr Evagoras Evagorou, Mr Andreas Christofe, Mr Georgios Leventis, Ms Eleni Loulli, Ms Maria Prodromou, Ms Despina Makri, Mr Stylianos Hadjipetrou, Mr Christos Theocharidis, Mr Philip Fayad, Mr Dimitris Kakoullis, Ms Kyriaki Fotiou and Ms Marina Pekri.

Overall, from 1 October 2019 until 31 March 2021, 127 journal and conference papers have been published according to Google Scholar and 119 according to Scopus records. In Google Scholar, a dedicated profile of the ECoE<sup>9</sup> (*Figure 17*) was created in order to be able to monitor the ECoE’s staff publications and their citations continuously and more efficiently, whereas in Scopus, a list of publications has been created for monitoring purposes, and to export publication statistics.

<sup>7</sup> Scopus: <https://www.scopus.com/>

<sup>8</sup> Google Scholar: <https://scholar.google.com/>

<sup>9</sup> ECoE’s Google Scholar profile: [https://scholar.google.com/citations?user=u\\_U65\\_8AAAAJ&hl=en](https://scholar.google.com/citations?user=u_U65_8AAAAJ&hl=en)



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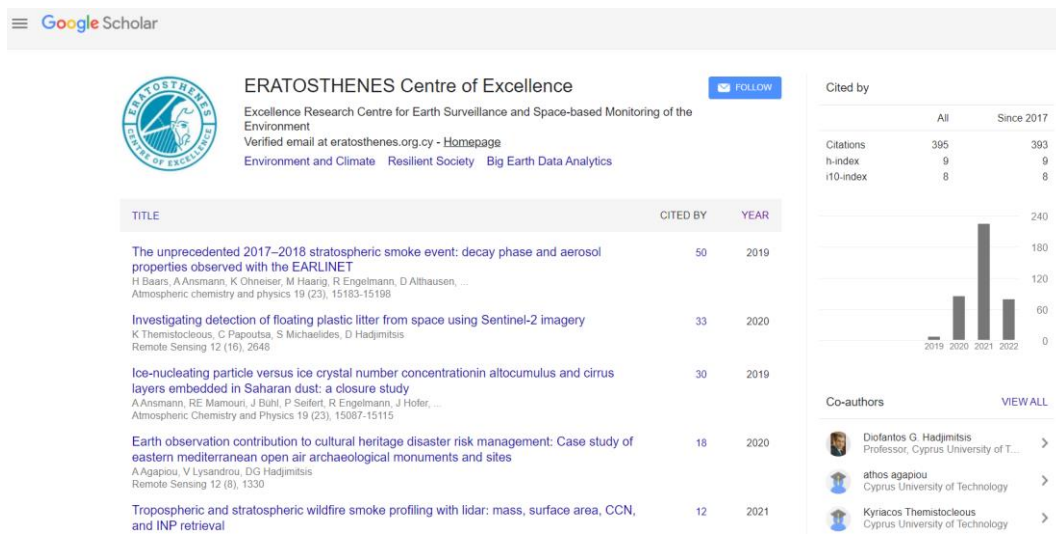


Figure 17: ECoE's Google Scholar profile

ECoE's publications have reached **395 citations** in Google Scholar and **285 citations** in Scopus (Figure 18) (SC03). Based on these publications and their respective citations, the **grouped h-index (P11)** of the ECoE researchers by the end of RP2 is **9 in Google Scholar and 7 in Scopus**, as presented in Figure 19. The citations and the h-index figures are cumulative, starting from 1 October 2019.

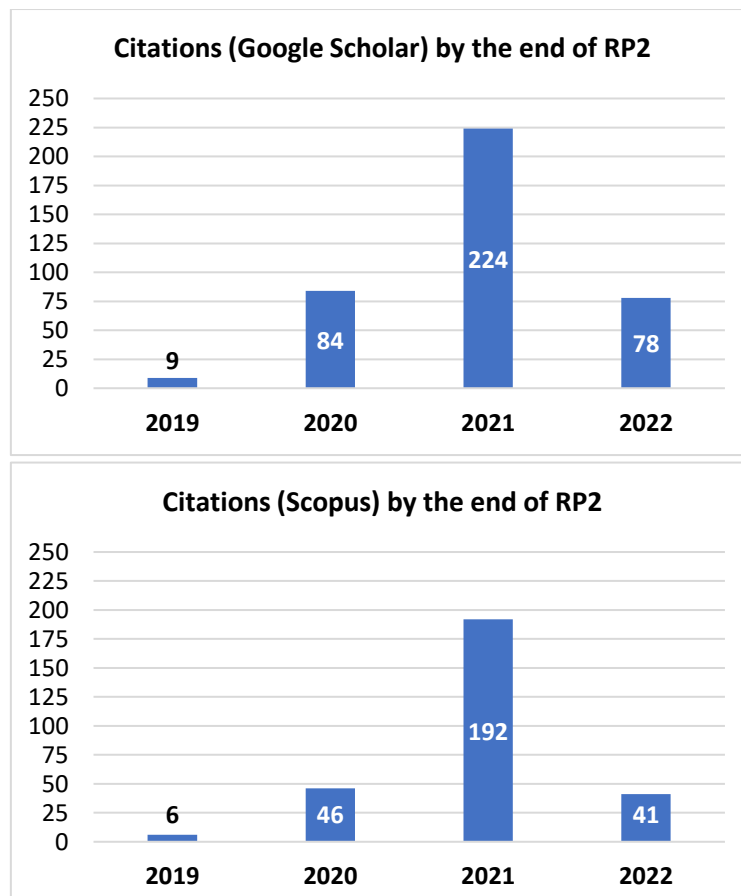


Figure 18: ECoE's publications citations per year as calculated in Google Scholar (top) and Scopus (bottom)



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These documents *h*-index

7

Of the documents considered for the *h*-index, 7 have been cited at least 7 times

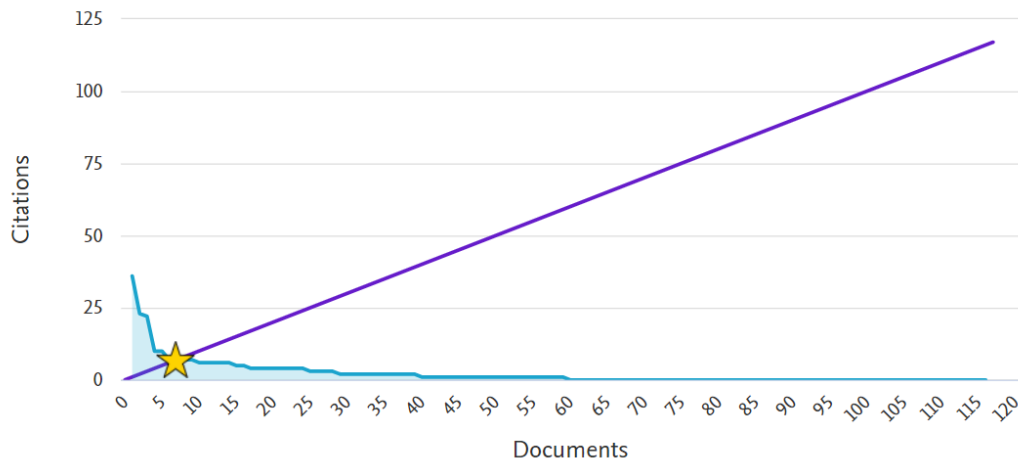


Figure 19: ECoE’s h-index as calculated in Scopus

The number of citations and the h-index, respectively, for year 2022 are expected to increase significantly as, RP2 runs until the end of March 2022. It is noted that based on the KPIs of the three departments, (i.e. Environment and Climate, Resilient Society and Big Earth Data Analytics) the cumulative citations for the first four years of the EXCELSIOR – Phase 2 project are expected to be 3000. The cumulative nature of citations makes it difficult to forecast the number of citations in the long-term, however, over the next few of years, it is expected that the number of publications will increase significantly, and thus, the ECoE’s publications citations are expected to meet this goal.

Furthermore, ECoE’s researchers participated in 7 international conferences/workshops, carrying out **22 oral and/or poster presentations (SC04)** regarding their research outputs and/or for promoting the ERATOSTHENES Centre of Excellence. A list of the conferences along with the date and subject of the respective presentations is provided below in *Table 7*.

Table 7: Participation in international conferences/workshops during RP2

#	Conference	Date	Type of presentation	Topic of presentation
1	EGU General Assembly 2021	19-30/04/2021	Poster	<ul style="list-style-type: none"> <li>The ERATOSTHENES Centre of Excellence in the POLLYNET. First observations of the POLLYXT-CYP at Limassol, Cyprus</li> </ul>
2	Workshop on solar energy applications	11/05/2021	Oral	<ul style="list-style-type: none"> <li>EXCELSIOR: Solar energy estimation in Cyprus</li> </ul>
3	40 <sup>th</sup> EARSeL Symposium 2021	07-10/06/2021	Oral	<ul style="list-style-type: none"> <li>Strategizing the “Smart City” model into an integrated system utilizing space technology and geoinformatics assets: A systematic approach to a resilient society: The study of Limassol, CY</li> <li>Calibration of Ground-based Data for Precipitation Estimation in the Area of Cyprus</li> <li>Monitoring Common Agriculture Policy and Cross Compliance with Sen4Cap</li> </ul>



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#	Conference	Date	Type of presentation	Topic of presentation
				<ul style="list-style-type: none"> <li>• Rapid Assessment of post fire forest regeneration based on burn severity gradient using the Google Earth engine</li> <li>• A Multi-disciplinary Integrated approach using EO, GIS, Hydraulic Modelling for flood risk assessment in catchment areas in Cyprus</li> <li>• Imaging Spectroscopy of shallow coastal waters</li> <li>• Estimation of mean sea surface height variability in Cyprus using Tide Gauge and Sentinel-3 Satellite Altimetry Data</li> <li>• Space-based Deformation Monitoring of Coastal Urban Areas: The case of Limassol's Coastal front</li> <li>• Considerations and Multi-Criteria Decision Analysis for the Installation of Permanent Infrastructures for Continuous Space-based Monitoring of Natural Hazards</li> <li>• Earth Observation for an efficient water management in Cyprus</li> </ul>
4	17 <sup>th</sup> International Conference on Environmental Science and Technology (CEST2021)	01-04/09/2021	Oral	<ul style="list-style-type: none"> <li>• Environmental Monitoring from Space &amp; Geoinformation through the EXCELSIOR H2020 Teaming Project</li> <li>• Intercomparison of satellite and ground-based precipitation in the area of Cyprus</li> <li>• The development of a Forest Canopy Density model in Akamas National Forest Park in Cyprus, using Landsat 8 and Sentinel 2 satellite data</li> <li>• Implementation of Maritime Spatial Planning (MSP) in Cyprus focusing on the European MSPs' good practices</li> </ul>
5	SPIE Remote Sensing 2021 conference	13-17/09/2021	Oral	<ul style="list-style-type: none"> <li>• Investigating the past using remote sensing techniques</li> <li>• Satellite-derived bathymetry for shallow coastal waters in Cyprus</li> <li>• Monitoring aquaculture fisheries using Sentinel -2 images by identifying plastic fishery rings</li> <li>• Detecting changes in vegetation and climate that serve as early warning signal on land degradation using remote sensing: a review</li> </ul>
6	15 <sup>th</sup> International Conference on Meteorology, Climatology and Atmospheric Physics (COMECAP 2021)	26-29/09/2021	Poster	<ul style="list-style-type: none"> <li>• The importance of Atmospheric Remote Sensing in the EMMENA region</li> </ul>
7	Workshop "Contribution of Geoinformatics in Soil Erosion modelling"	04/02/2022	Oral	<ul style="list-style-type: none"> <li>• Remote Sensing for Soil Erosion Investigation In Cyprus: Selected Case Studies</li> </ul>



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### Dust in Cyprus

- Dust is a significant fraction of the aerosol mixture, not only in Cyprus, but in general over the EMMENA region
- In Cyprus, dust transfer from North Africa and middle East is frequent, especially in Spring

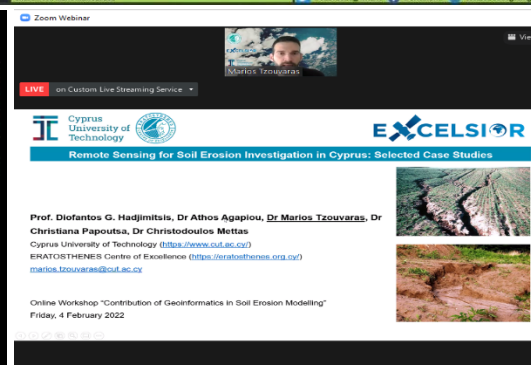
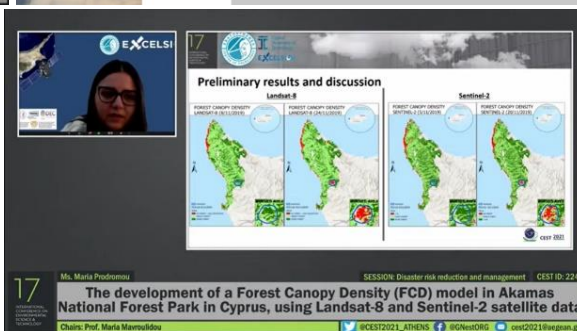
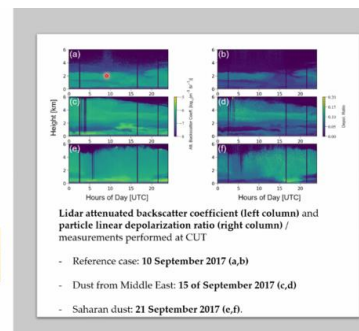
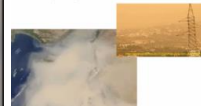


Figure 20: Participation in international conferences/workshops

## 2.12 Patents

The ERATOSTHENES Centre of Excellence (ECoE) aims to explore the commercial value potential of the results of its ongoing research in several projects. Being a technology-based innovation developer, we seek to become an organisation utilising and applying the technology for marketable products and define the strategy of exploitation for various technologies that combine remote sensing and Earth Observation.

As presented in *D1.14: Impact Assessment Report for RP1*, three current technologies of the ECoE have been identified to be exploitable, namely a Smart 'CropWATER' Valve system (SCWV), a Concrete Corrosion Remote Sensing System (CCRSS) and a Novel Integrated Technology for the Characterization of Asphalt system (NITCA).

The ECoE has already used the IP Booster-META group<sup>10</sup> service of the European Union and has spent the amount of €25,000 to receive services in Patent Landscaping, IP Evaluation and Due Diligence and

<sup>10</sup> Intellectual Property Booster-META group: <https://ipbooster.meta-group.com/>



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Patents Design and Trademark Applications for the 3 technologies of the Eratosthenes Centre of Excellence. The ECoE is currently in the process to obtain Comprehensive IP evaluation/ due diligence for the CCRSS technology prior to submitting for IPR protection. Therefore, substantial progress is made for **3 services** to be patented as prototypes (**SC06**). We are continuing the IP evaluation for the 3 technologies, and we have already started the process for IP protection of the CCRSS technology.

### 2.13 Start-ups and spin-offs

**No start-ups and/or spin-offs** and therefore **no turnover** was achieved during RP2 (**SC07, SC08**). However, following the progress made during RP1, several additional meetings have taken place with CyRIC<sup>11</sup>, the GRAVITY<sup>12</sup> incubator and the Cyprus Association of Research and Innovation Enterprises<sup>13</sup> (CARIE) in that direction, during RP2. Following consultations with ESA, the ECoE will proceed with the development of a Space Business Incubation Centre (BIC) in Cyprus (**S08**). ECoE has already attended meetings with ESA PECS representatives in Cyprus in collaboration with DEC representatives to discuss the establishment of the Space BIC in Cyprus. An official letter has already been sent to the Deputy Ministry of Research, Innovation and Digital Policy (DMRID) to explain the need to establish a Space BIC in Cyprus. On 14 February 2022, a meeting took place at the CUT/ECoE premises with the Director of DMRID regarding the development of the Space BIC in Cyprus.

### 2.14 Workshops, meetings, and other activities

In this section, a list of the workshops, meetings, and other activities that the ECoE organised during the period 1 January 2021 – 31 March 2022 (RP2), targeting local authorities, public and private stakeholders, and academia, is provided in *Table 8*. All events are disseminated through the ECoE's website<sup>14</sup>; more specifically under the News & Events section. All events are also communicated through the EXCELSIOR project newsletters<sup>15</sup>. In general, all activities presented in this section are expected to have an impact in terms of network development of the ECoE, expecting to lead to an increase in its stakeholders. Activities targeting non-academic audiences have an educational/societal impact as they aim to increase the scientific culture of Cyprus. Moreover, meetings and events where the EXCELSIOR project and its activities were presented were also considered to have a dissemination impact. Meetings with public authorities and governmental departments as well as presentations to students have an educational and/or societal impact.

Table 8: Workshops, meetings, and other activities during RP2 of the EXCELSIOR project

#	Date	Activity
1	29/01/2021	Final event of ARinfuse Erasmus+ Project
2	03/02/2021	Meeting with Cyta
3	08-12/02/2021	Interview at Pafos Radio
4	15/02/2021	Presentation of the EXCELSIOR H2020 Teaming project to postgraduate students of CUT

<sup>11</sup> CyRIC: <https://www.cyric.eu/>

<sup>12</sup> GRAVITY incubator: <https://gravity.ventures/>

<sup>13</sup> CARIE: <https://carie.eurocynergy.com/>

<sup>14</sup> ECoE website: <https://eratosthenes.org.cy/>

<sup>15</sup> EXCELSIOR Newsletters: <https://eratosthenes.org.cy/newsletters/>



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#	Date	Activity
5	15-16/02/2021	Department of Civil Engineering and Geomatics Evaluation Committee
6	18/02/2021	Article in the monthly newsletter of the Limassol Chamber of Commerce and Industry
7	19/02/2021	Interview of Dr Rodanthi Elisavet Mamouri at Phileleftheros newspaper
8	25/02/2021	MEDRIN annual 2021 meeting
9	25/02/2021	TV appearance at Sigma TV, Cyprus
10	26/02/2021	Invited talk by Prof. Evangelos Baltas, National Technical University of Athens, Greece
11	03/03/2021	Article in the monthly newsletter of the Limassol Chamber of Commerce and Industry
12	03/03/2021	Meeting with Imperial College
13	17/03/2021	Meeting with Norwegian Geotechnical Institute
14	21/03/2021	TV appearance at CyBC news
15	24/03/2021	Live Event of Math Works: MATLAB & Simulink MENA Academic Forum
16	29-30/03/2021	ACTRIS IMP Meeting
17	31/03/2021	Invited talk by Prof. Lena Halounova, Czech Technical University of Prague, Czech Republic
18	07/04/2021	Cyprus Launch Event for Horizon Europe
19	12-16/04/2021	First School on Smart Data Processing and Systems of Deep Insight
20	19-30/04/2021	EGU General Assembly 2021
21	27/04/2021	Urban Heritage Climate Observatory
22	11/05/2021	Workshop on solar energy applications
23	11/05/2021	Interview at Logos Radio
24	14/05/2021	Meeting with General Manager of Alexander College in Paphos
25	17-21/05/2021	OPHERA 1 <sup>st</sup> Workshop
26	20/05/2021	Cluster meeting "Sustainable Agriculture and natural resources" organized by the European Research Executive Agency (REA), Unit C3 Widening Participation
27	07-10/06/2021	40 <sup>th</sup> EARSeL Symposium 2021
28	08/06/2021	Second Virtual EXCELSIOR Workshop: "Atmospheric & Climate Research in the EMMENA Region"
29	14/06/2021	Visit at the 10 <sup>th</sup> Elementary School of Paphos Evagoras Pallikaridis
30	14/06/2021	Visit at the Elementary School of Erimi, Limassol
31	15/06/2021	Invited talk by Mr Kostas Aristeidou (Water Development Department Nicosia, Cyprus), Dr Athanasios Loukas (Aristotle University of Thessaloniki, Greece), Dr Catalin Stefan (INOWAS, TU Dresden, Germany) and Dr Gordana Jakovljevic (University of Banja Luka, Bosnia and Herzegovina)
32	15-17/06/2021	Joint NASA MedRIN and SCERIN Virtual Capacity Building Workshop
33	18-20/06/2021	1 <sup>st</sup> CASSINI Space Data Hackathon
34	23/06/2021	Invited talk by Dr Philippa Mason, Imperial College London, UK
35	24/06/2021	Earth Observation Network seminar at the Imperial College London
36	28/06/2021	Meeting with U.S. Embassy in Cyprus
37	13-15/07/2021	DEFEA - Defence Exhibition Athens
38	01-04/09/2021	17 <sup>th</sup> International Conference on Environmental Science and Technology-CEST2021
39	08/09/2021	Freshers' week at the Cyprus University of Technology
40	13-17/09/2021	SPIE Remote Sensing 2021 conference
41	21-22/09/2021	Research and Innovation Workshop
42	24/09/2021	European Researchers' Night 2021
43	26-29/09/2021	15 <sup>th</sup> International Conference on Meteorology, Climatology and Atmospheric Physics – COMECAP2021
44	27/09/2021	Discussion on "The human agenda" podcast





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#	Date	Activity
45	28/09-01/10/2021	1 <sup>st</sup> DESIS User Workshop
46	11/10/2021	Meeting with Dr Catalin Stefan in Paphos, Cyprus
47	12/10/2021	Invited talk by Mr Stelios Bolanos, Planetek Hellas, Greece
48	14/10/2021	Visit from the Deputy Minister of Development and Investment of Greece and the Deputy Minister of Research, Innovation and Digital Policy of Cyprus
49	15/10/2021	Visit at Agiou Neofytou High School in Paphos, Cyprus
50	21/10/2021	Visit from ERASMUS+ students at our premises in Limassol, Cyprus
51	26/10/2021	Invited talk by Ms Mary Grace Gasco, SpaceCrop technologies, Hungary
52	01/11/2021	TV appearance at Alpha TV, Cyprus
53	02/11/2021	Invited talk by Ms Els Knaeps, VITO Remote Sensing, Belgium
54	03/11/2021	Visit at Aradippou 2 <sup>nd</sup> primary school in Larnaca, Cyprus
55	10/11/2021	Stakeholder event for Cyprus Civil Service
56	10/11/2021	Online presentation at Alexander College & Alexander Research Centre, Cyprus
57	17/11/2021	Invited talk by Prof. Marinos Kavouras, National Technical University of Athens, Greece on the occasion of GIS Day for EXCELSIOR
58	19/11/2021	Invited talk by Mr Ioannis Kontos and Ms Anastasia Mavridaki, Marathon Data Systems, Greece, on the occasion of GIS Day for EXCELSIOR
59	02/12/2021	FPCUP science café in Limassol, Cyprus
60	07/12/2021	Seminar "Space technologies: Applications in the public sector"
61	09/12/2021	PRAXI network informational event
62	15/12/2021	Invited talk by Dr Chiara Lapucci, Institute of Bioeconomy of the National Research Council in Florence, Italy
63	17/12/2021	Meeting with the Minister of Climate Change and Civil Protection of the Hellenic Republic, Dr Christos Stylianides
64	19/01/2022	Stakeholder event for Industry and Research and Innovation organisations in Cyprus
65	04/02/2022	Workshop "Contribution of Geoinformatics in Soil Erosion modelling"
66	04/02/2022	Stakeholder event for the EMMENA region
67	14/02/2022	Meeting with the director of the Deputy Ministry of Research, Innovation and Digital Policy and the director of the Department of Electronic Communications
68	15/03/2022	Invited talk by Dr Mark Parrington, Copernicus Atmosphere Monitoring Service (CAMS) and European Centre for Medium-Range Weather Forecasts (ECMWF)

CUT/ECoE organised and/or participated in **68 events (S03)** during the RP2 with the aim to expand their network, disseminate the EXCELSIOR project outputs, promote innovation, and promote the activities of the ECoE to public authorities, governmental departments, and schools to increase the societal and educational impact.

A highlight was the organisation of the Second Virtual EXCELSIOR Workshop: "Atmospheric & Climate Research in the EMMENA Region" on 8 June 2021 by the ECoE together with the Cyprus Remote Sensing Society for the RSCy2021 (*Figure 21*), addressing the different activities of the ECoE such as infrastructure, research, education, and innovation through entrepreneurship. It featured 22 invited talks by scientists and researchers of high calibre from NASA, ESA, TROPOS, DLR, NOA and other leading organisations. 148 people registered for the event, from various countries such as France, Germany, Greece, India, Guatemala, Israel, Pakistan, Italy, Romania, Serbia, Tunisia, USA, UAE, Germany, Azerbaijan, Bosnia Herzegovina, Bulgaria, Cyprus, etc. and representing the general public, Industry, civil society, policy makers, and the scientific community, as presented in *Figure 22*.



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Figure 21: The Second Virtual EXCELSIOR Workshop: "Atmospheric & Climate Research in the EMMENA Region" co-organised by the ECoE on 8 June 2021

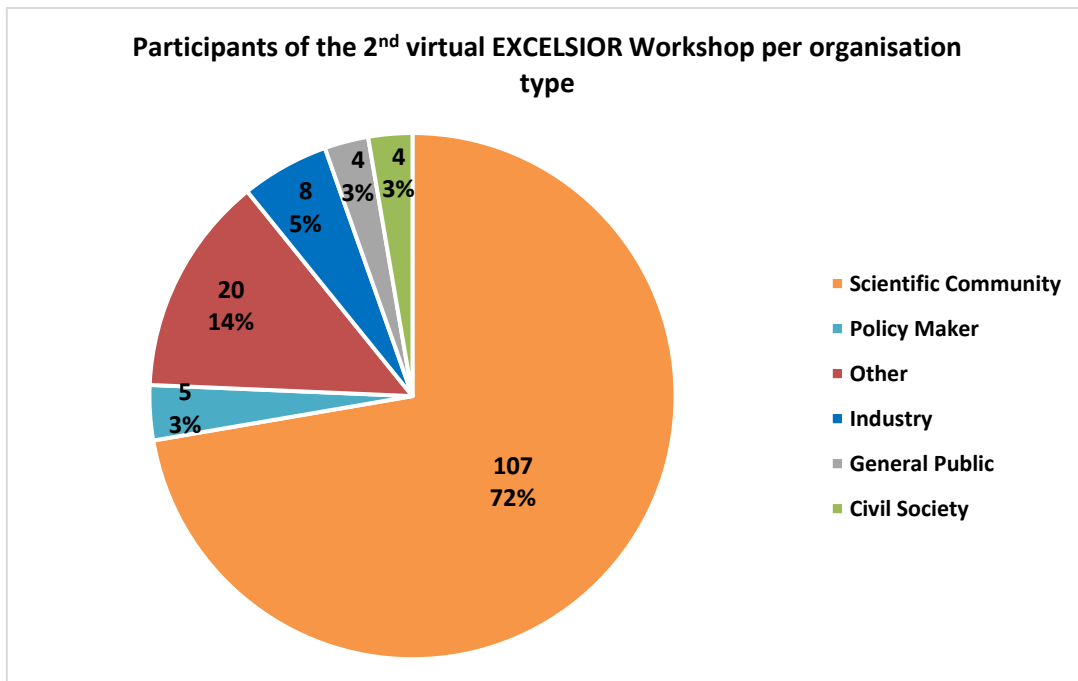


Figure 22: Participants of the 2nd virtual EXCELSIOR Workshop per organisation type

Moreover, Prof. Diofantos Hadjimitsis participated as a judge, and ECoE team members as mentors for the participants of the 1<sup>st</sup> CASSINI Space Data Hackathon in Cyprus on 18-20 June 2021 (Figure 23),



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organised by CyRIC, an EXCELSIOR affiliated partner, in collaboration with the Gravity Ventures Incubator and the ECoE.

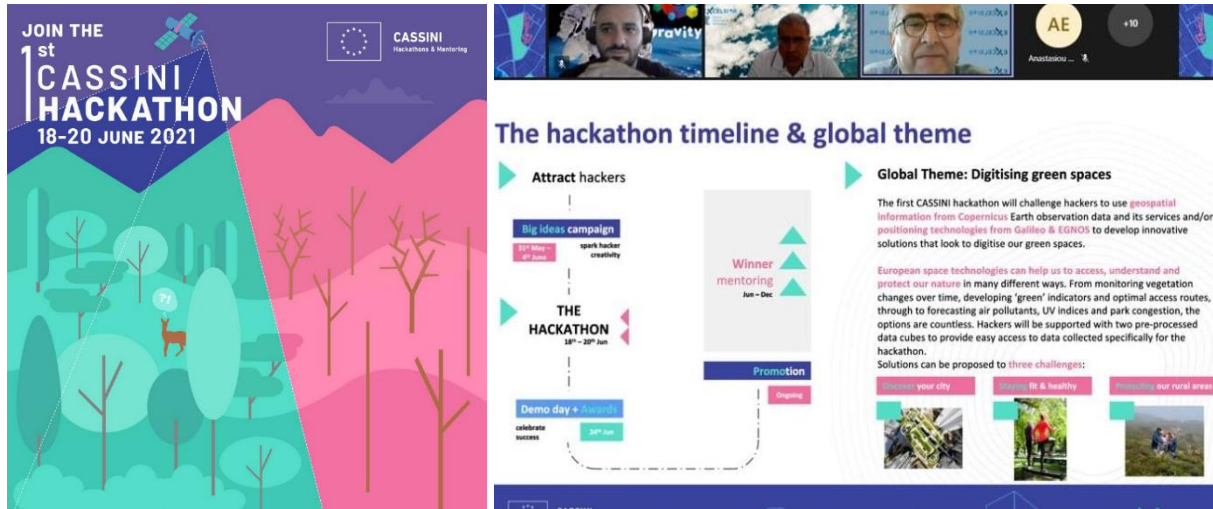


Figure 23: The 1<sup>st</sup> CASSINI Space Data Hackathon in Cyprus on 18-20 June 2021

Moreover, the ECoE participated at the Cyprus Launch Event for Horizon Europe on 7 April 2021 (Figure 24), where Ms. Eleni Loulli talked about the success of the EXCELSIOR H2020 Teaming Project and the establishment of the ECoE of the Cyprus University of Technology.



Figure 24: The Cyprus Launch Event for Horizon Europe on 7 April 2021

Local authorities and public stakeholders as well as national and international stakeholders from industry and the academic/research sectors have also been addressed through meetings and participation in and/or co-organisation of informational events. These actions are expected to attract more stakeholders to the ECoE’s network. **25 activities** have addressed these networks (**S04**) during RP2. An indicative activity is the invited talk at the NASA-Mediterranean Regional Information Network (MedRIN) Annual Meeting on 25 February 2021 (Figure 25), where Prof. Hadjimitsis presented the EXCELSIOR H2020 Teaming project and highlighted the needs, opportunities, and challenges for the Space-Monitoring of the Environment in the Mediterranean region, to approximately 100 attendees from academia and industry from the EMMENA region and the USA.



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Figure 25: The MedRIN annual meeting on 25 February 2021

Moreover, during RP2, eleven (11) invited talks were organised by the ECoE (Figure 26), addressing representatives from academia/scientific community, industry, civil service, policy makers and the general public from Cyprus and abroad. 874 people attended these events coming from various countries from Europe, Middle East, Africa, Asia, and America. More detailed information is provided below in Table 9.

Table 9: Invited talks organised by the ECoE during RP2

#	Date	Presenter	Topic	Attendees (Countries)
1	26/02/2021	Prof. Evangelos Baltas, National Technical University of Athens, Greece	Applications in Flood Risk Assessment - Rainfall-runoff estimation and forecasting using novel technologies in the Mediterranean Region	95 (Cyprus, Cameroon, Greece, Bulgaria, Afghanistan, USA, Tunisia, Pakistan, Norway, Nepal, Myanmar, Malta, Italy, Indonesia, India, Germany, Ethiopia, Egypt)
2	31/03/2021	Prof. Lena Halounova, Czech Technical University of Prague, Czech Republic	Remote Sensing, Land Use/Land Cover Data, and Example of Their Harmonisation	117 (Cyprus, Romania, USA, Serbia, Ukraine, Netherlands, Italy, Tunisia, Poland, UK, Israel, Spain, Canada, Norway, Greece, Germany, Belgium, Egypt, Bulgaria, Japan, Malaysia, Indonesia, Bosnia Herzegovina, Algeria, India, Azerbaijan)
3	15/06/2021	Mr Kostas Aristeidou (Water Development Department Nicosia, Cyprus), Dr Athanasios	Water Resources Management	88 (Greece, Italy, Malta, Serbia, Pakistan, Austria, Portugal, Cyprus, Ireland, Myanmar, Bolivia, India,



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#	Date	Presenter	Topic	Attendees (Countries)
		Loukas (Aristotle University of Thessaloniki, Greece), Dr Catalin Stefan (INOWAS, TU Dresden, Germany) and Dr Gordana Jakovljevic (University of Banja Luka, Bosnia and Herzegovina)		Germany, Bulgaria, USA, Indonesia)
4	23/06/2021	Dr Philippa Mason, Imperial College London, UK	Developing quantitative InSAR tools for environmental monitoring	79 (Cyprus, Egypt, Italy, Myanmar, Netherlands, Serbia, Slovakia, France, Germany, Greece, India, Israel, Tunisia, USA, UK, Albania, Bosnia Herzegovina, Bulgaria, China)
5	12/10/2021	Mr Stelios Bolanos, Planetek Hellas, Greece	EO based information for the public and the private sector / Today and the future	72 (Bosnia and Herzegovina, Bulgaria, Canada, Cyprus, Italy, Myanmar, Romania, Malta, Greece, Germany, Serbia, Sri Lanka, Netherlands, USA, UK)
6	26/10/2021	Ms Mary Grace Gasco, SpaceCrop technologies, Hungary	Spatial Decision Support Tool for Monitoring and Forecasting Soil Water Requirements in Agriculture	61 (Cyprus, Germany, Egypt, Hungary, Greece, India, Iran, Israel, Italy, Myanmar, Malta, Philippines, Romania, Serbia, UK, Bosnia Herzegovina, Bulgaria)
7	02/11/2021	Ms Els Knaeps, VITO Remote Sensing, Belgium	Developing tools for marine plastics monitoring	69 (Cyprus, Canada, Bosnia Herzegovina, Luxembourg, Belgium, Vietnam, Sri Lanka, Bulgaria, Serbia, Portugal, UK, Italy, Myanmar, Iran, India, Israel, Greece, Egypt, Germany, Ethiopia)
8	17/11/2021	Prof. Marinos Kavouras, National Technical University of Athens, Greece	Trends, challenges and perspectives in GIS	105 (Albania, Greece, Cyprus, Germany, India, Israel, Italy, Malta, Myanmar, Netherlands, Nigeria, Portugal, Serbia, Sierra Leone, South Africa, Thailand, USA)
9	19/11/2021	Mr Ioannis Kontos and Ms Anastasia Mavridaki	Features and applications of ArcGIS Geographic Information Systems	80 (Cyprus, Greece, Denmark, Indonesia, Pakistan, Tunisia, USA)
10	15/12/2021	Dr Chiara Lapucci, Institute of Bioeconomy of the	Use of satellite and model data to identify the onset of	54 (Italy, Cyprus, Greece, Bosnia Herzegovina, Romania, Syria, France,



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#	Date	Presenter	Topic	Attendees (Countries)
		National Research Council in Florence, Italy	Ostreopsis ovata harmful algal bloom in the Ligurian Sea	Germany, Israel, Portugal, Myanmar, Sierra Leone
11	15/03/2022	Dr Mark Parrington, Copernicus Atmosphere Monitoring Service (CAMS) and European Centre for Medium-Range Weather Forecasts (ECMWF)	The role of Earth Observation data in the Copernicus Atmosphere Monitoring Service for atmospheric composition and air quality	54 (Italy, Greece, Bosnia and Herzegovina, Romania, Cyprus, Syria, Germany, France, Israel, Portugal, Myanmar, Sierra Leone)



Figure 26: Invitations for the invited talks organised by the ECoE during RP2

Last, three (3) events targeting stakeholders in Cyprus and the EMMENA region were organised by the ECoE during RP2 (Figure 27). On 10 November 2021, an online event addressing local authorities and key stakeholders from the public sector in Cyprus to identify their needs and interests was organised



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by the ECoE. 23 people attended the event and participated actively by filling in questionnaires that will facilitate the cooperation between ECoE and the respective authorities. Furthermore, ECoE organised a stakeholder event for Industry and Research and Innovation organisations in Cyprus on 19 January 2022, where 26 people attended to receive valuable information regarding the activities of the ECoE and provide feedback on their needs and interests in order to find ways to collaborate. Last, on 4 February 2022, a stakeholder event for the EMMENA region was organised by the ECoE, where 13 people from academic institutions, research organisations and stakeholders from the public and private sector attended the event. The target of these meetings was to provide an overview to the stakeholders about the capacity of ECoE and the potential collaborations that can be conducted, and to identify sectors of common interest, where ECoE can be beneficial to stakeholders. These meetings have already led to a variety of collaborations, such as research project proposals and the development of services by the ECoE team.



Figure 27: Stakeholders' events organised by the ECoE during RP2

On 21-22 September 2021, our team member, Dr Nicholas Kyriakides presented the EXCELSIOR H2020 project at the Research and Innovation Workshop, organised by the Ministry of Defence. With this workshop, the Ministry aimed at exploring the prospects of cooperation with the Cypriot ecosystem in the field of Defence and Security. On 7 December 2021, Dr Kyriacos Themistocleous was invited for a presentation titled "European Space Programme for Earth Observation COPERNICUS" at the seminar "Space technologies: Applications in the public sector", organised by the Department of Electronic Communications of the Deputy Ministry of Research, Innovation and Digital Policy. The purpose of the seminar was to inform the public services and promote the use of space technologies and applications, as tools to facilitate various tasks and upgrade the quality of products and services as well as to enhance the efficiency and productivity of the public service.

Regarding non-academic audience, around **19 activities** have been organised (**S09**), in the form of school visits, presentations to university students, information days, science cafes, newspaper articles and mass media appearances (radio, TV, podcasts, etc.) to increase of scientific culture of the country. Some of them are the following:

- **4 school visits**, namely, at the 10<sup>th</sup> elementary School of Paphos Evagoras Pallikaridis, the elementary school of Erimi in Limassol, the Agiou Neofytou High School in Paphos and the Aradippou 2<sup>nd</sup> primary school in Larnaca, with over **200 students** participating.



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- **3 presentations to over 170 university students** at the Cyprus University of Technology in Limassol and the Alexander College in Paphos, were carried out during RP2, to inform students about the science of Earth Observation and remote sensing, as well as the benefits of Copernicus EU. Activities of the ECoE were also presented.
- On 21 October 2021, **30 ERASMUS+ students** from Romania were hosted at our premises at the Cyprus University of Technology in Limassol, Cyprus. Presentations were given to introduce them to the science of Remote Sensing and Geoinformation, followed by hands-on exercises to familiarize them with the use of Copernicus EU data.

On 24 September 2021, the ERATOSTHENES Centre of Excellence, the EXCELSIOR H2020 Teaming Project and the Department of Civil Engineering and Geomatics of the Cyprus University of Technology, participated at the European Researcher's Night organised by the Research and Innovation Foundation in Cyprus (*Figure 28*). The "Researcher's Night" is an event aimed at familiarizing the public with the world of science and research and at the same time strengthening the public image of researchers, as well as highlighting the important role they play in society. Our team participated with the following virtual booth: "The Green Age through Space Technologies: Earth Observation & Geoinformatics".



Figure 28: Participation of the ECoE at the European Researchers' Night 2021

On 2 December 2021, a science café was organised by the ECoE team members, in the framework of the FPCUP project, presenting Copernicus data and services, and ways to use them for applications in the fields of Atmosphere, Land and Water to approximately 20 people (non-academic audience) in a relaxed environment. Furthermore, numerous appearances in TV, radio and newspapers have been carried out by the ECoE team members addressing wider audience. Some highlights are the interview of Dr Rodanthi Elisavet Mamouri in "Phileleftheros" newspaper to inform the public about ECoE's new lidar PollyXT-CYP and its importance for the future of atmospheric observations in the Eastern Mediterranean Region and explain the significance of the EXCELSIOR H2020 Teaming Project in the development of the ERATOSTHENES Centre of Excellence. Dr Christiana Papoutsas and Ms Maria Prodromou were hosted by the TV show "Protoselido" on 25 February 2021 to present the EXCELSIOR project as well as the actions of the ERATOSTHENES Centre of Excellence to promote Earth Observation through its initiative #EXCELSIORforschools and other activities. Interviews were also given





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by ECoE's researchers to various radio stations, with local or national coverage, such as Pafos radio and Logos radio and in the form of podcasts.



Figure 29: Promotion of the ECoE and its activities through press and TV

Furthermore, on 21 March 2021, ASTRO 1 and SpaceUP Cyprus were presented by our team member Mr Elpidoforos Anastasiou at the Cyprus Broadcasting Corporation news. SpaceUp Cyprus 2021 LIVE took place in the framework of the First Pancyprian Space Education Week, which was organised by the Cyprus Space Foundation, the EXCELSIOR H2020 Teaming Project and the ERATOSTHENES Centre of Excellence of the Cyprus University of Technology.



Figure 30: SpaceUp Cyprus 2021 LIVE co-organised by the ECoE on CyBC news

On November 2021, DLR provided the opportunity to the ECoE to join an existing ESA funded project <https://urban-tep.eu/>, involving the Limassol Municipality as a case study in this project.



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### 3 Measuring Impact through KPIs for RP2

Measuring impact is a practice that requires measurement expertise and a transparent participatory process to ensure that the KPIs used in the IA are valid and reliable. A quantitative assessment of the EXCELSIOR project' impact will be made through the definition and monitoring of KPIs. **A KPI is a metric that embeds performance targets so organizations can chart progress toward goals.** KPIs and metrics can be used to think through what counts as evidence, demonstrating whether impact occurred or not. The goal is to use KPIs and metrics as one line of evidence to make better decisions. The advantage of using matrices is that they provide an easy-to-understand visual representation across all the impacts.

*Table 10* indicates the KPIs for the EXCELSIOR project during the first 4 years of operation. Note that the KPIs are cumulative, i.e., by Year 7 also includes the KPIs from Year 4. KPIs showcase the impact at three different levels, such as:

- Impact at the level of participating organisations
- Impact at the level of the related scientific community
- Impact at societal level at large



Table 10: List of Key Performance Indicators

Impact: Participating organisations						
#	Key Performance Indicator (KPI)	Metric	Progress (Separately for each period)		Progress (Cumulative)	Target
			During RP1	During RP2	1/10/2019 – 31/3/2022	By YR4 (30/9/2023)
P01a	The acquisition of equipment necessary to establish a Centre of Excellence in Cyprus, including a satellite ground receiving station	The purchase of equipment for the operation of a satellite ground receiving station at the Centre of Excellence	Specs are prepared. The tender is currently in preparation (CUT-DLR)	<b>Finalisation of tender (expected to be issued in approximately 2 months)</b>	<b>Finalisation of tender (expected to be issued in approximately 2 months)</b>	Satellite ground receiving station
P01b	The acquisition of equipment necessary to establish a Centre of Excellence in Cyprus, including a supersite for aerosol and cloud monitoring	The purchase of equipment for the operation of research facilities of the Centre of Excellence	Specs and tender are prepared and submitted to CUT tendering committee. PollyXT lidar, part of TROPOS' commitment, has been received.	<b>Tender was issued. Results/ prices are expected by end of February 2022</b>	<b>Tender was issued. Results/ prices are expected by end of February 2022</b>	Supersite for aerosol and cloud monitoring; advanced aerosol polarization /Raman Lidar
P01c	The acquisition of equipment necessary to establish a Centre of Excellence in Cyprus and utilize equipment that can be used in remote sensing and Earth observation	The purchase of equipment for the operation of research facilities of the Centre of Excellence	Market Research	<b>Discussions and market research</b>	<b>Discussions and market research</b>	Field spectroradiometers and accessories; Aerial, ground and water vehicles; Geodetic equipment; In situ sensors and calibration instruments; IT infrastructure; additional equipment
P02a	Utilise synergies between all partners and dedicated staff visits for training, skills improvement, and empowerment	Number of trainings and capacity building activities (staff exchange, secondments, etc.)	N/A	<b>3 (2 by NOA, 1 by DLR)</b>	<b>3 (2 by NOA, 1 by DLR)</b>	Due to Covid-19, a lot of the trainings have been changed to online workshops/trainings
P02b	Utilise synergies between all partners and dedicated staff visits for training, skills improvement, and empowerment	Person-months allocated for training and capacity building activities	N/A	<b>5.07</b>	<b>5.07</b>	Due to Covid-19, a lot of the trainings have been changed to online workshops/trainings
P02c	Utilise synergies between all partners and dedicated staff visits for training, skills improvement, and empowerment	Number of people participated in demonstration projects	N/A	<b>0</b>	<b>0</b>	20



Impact: Participating organisations						
#	Key Performance Indicator (KPI)	Metric	Progress (Separately for each period)		Progress (Cumulative)	Target
			During RP1	During RP2	1/10/2019 – 31/3/2022	By YR4 (30/9/2023)
P03	Participation to Research and Infrastructure Networks, Technological Platforms and Clusters with focus on Space Technologies and EO	Number of research institute networks that ECoE participate in	7 (GEO, CyDI-Hub, IEEE SA, Copernicus Academy, MedRIN, NEREUS, GEO-CRADLE)/ 1 in progress (IEEE GRSS)	0	7	4
P04	Establish and operate a Calibration and Validation site for satellite data at the ECoE	Number of associations with calibration and validation networks	2 (EARLINET, PollyNet) 1 in progress (ACTRIS)	1 (ACTRIS IMP)	3	1
P05a	Strengthen the critical mass of researchers by offering a dynamic environment for basic and applied research in EO	Number of researchers employed	In progress (Announcement for 3 open positions for Senior Researchers A or B)  FTE=3.06 from CUT 9 positions for researchers and technicians announced (31 applications received)	3 researchers	3 researchers	40
P05b	Attract European Research Council and Marie Curie grants as hosting Centre	Number of Researchers (MSC Fellows, ERC, etc.) hosted at ECoE	In progress (MSC=0, ERC=0)	In progress (MSC=0, ERC=0)	In progress (MSC=0, ERC=0)	MSC=4 ERC=0
P06a	Strengthen the relationship with national stakeholders through specific agreements in EO domain	Number of MoU signed with various local/national public and private organisations	N/A	12	12	20
P06b	Strengthen the relationship with international stakeholders through specific agreements in EO domain	Number of MoU signed with various international public and private organisations	N/A	4	4	6
P07	Maintain and enhance the capacity of training in EO to new users including those from non-EU and developing countries	Number of external participants in professional skills development programs offered by the ECoE	N/A	0	0	40



Impact: Participating organisations						
#	Key Performance Indicator (KPI)	Metric	Progress (Separately for each period)		Progress (Cumulative)	Target
			During RP1	During RP2	1/10/2019 – 31/3/2022	By YR4 (30/9/2023)
P08	Provision of advanced observing platforms and calibration/validation facilities to Trans-national Access to the benefit of a large user community	Number of collaborating networks/ institutions that access the ECoE's data for implementation of scientific projects/field campaigns and common scientific research agenda	N/A	0	0	1
P09a	Development of one innovative MSc programme (conventional and distance learning) and one innovative PhD programme in the wider area of EO	Number of MSc and PhD students registered annually at CUT, carrying out research at the ECoE	41	28	69	80
P09b	Attract MSc and PhD students from abroad	Percentage of MSc and PhD students from abroad	35.7% (6 students from Greece, 2 from Italy, 1 from Serbia and 1 from UK)	3.57%	19.64% (Average)	10-15%
P10a	Research project proposals submitted for funding through participation as partner or coordinator	Number of research project proposals submitted for funding	38 (CUT and ECoE)	36	74	180
P10b	Success rate for the submission of research project proposals	Number of successful research project proposals submitted for funding	6	6	12	18
P10c	Funding secured from the development of research project proposals	The total amount of funds received from the successful submission of research project proposals	€1,543,578.22 (Yearly average) for CUT €306,912.5 under review	€245,389,60	€245,389,60	€5M
P11	Citations from publications related to the ECoE, which result in a h-Index	h-index from ECoE related publications (Scopus, Google scholar)	47*	Scopus: 7 Google Scholar: 9	Scopus: 7 Google Scholar: 9	30



**Impact: Scientific community**

#	Key Performance Indicator (KPI)	Metric	Progress (Separately for each period)		Progress (Cumulative)	Target
			During RP1	During RP2	1/10/2019 – 31/3/2022	By YR4 (30/9/2023)
SC01	Publication of Journal papers resulting from research conducted at the ECoE	Number of articles in peer-reviewed scientific journals	32	37	69	80
SC02	Publication of Conference papers resulting from research conducted at the ECoE	Number of articles published in the proceedings of International Conferences	32	15	47	120
SC03	Citations listed in Scopus and Google Scholar from publications related to the ECoE	Number of citations on ECoE related publications from Scopus and Google Scholar	1268*	Scopus: 285 Google Scholar: 395	Scopus: 285 Google Scholar: 395	3000
SC04	Participation in International Conferences/workshops	Number of presentations (oral/ posters) in International Conferences/workshops	14	22	36	50
SC05	Foster mobility among researchers (towards and from the Centre) with Universities, research Centres and the private sector, excluding EXCELSIOR consortium	Number of personnel visiting and/ or using the ECoE facilities and Number of ECoE personnel seconded to other organisations	N/A	0	0	10
SC06	Development of integration tools to fully exploit the use of multiple EO/RS at ground-based stations, in particular for the calibration/ validation/ integration of satellite sensors.	Number of patents/ new methodologies/prototypes /designs developed	In progress (Significant progress is made for 3 services as CUT and ECoE)	In progress (Significant progress is made for 3 services as CUT and ECoE)	In progress (Significant progress is made for 3 services as CUT and ECoE)	0
SC07	Promotion of innovation through incubators, accelerators, and spin-offs	Number of start-ups and/ or spin-offs created utilising products or expertise gained from the ECoE Research Areas	In progress (Meetings with CyRIC, GRAVITY incubator; ESA BIC)	In progress (Meetings with CyRIC, GRAVITY incubator; Space BIC)	In progress (Meetings with CyRIC, GRAVITY incubator; Space BIC)	0
SC08	The turnover (profit) of start-ups and spin-off companies that are directly related to ECoE activities	Turnover (Profit) of companies; start-ups and/ or spin-offs directly related to ECoE activities	0	0	0	0



### Impact: Society

#	Key Performance Indicator (KPI)	Metric	Progress (Separately for each period)		Progress (Cumulative)	Target
			During RP1	During RP2	1/10/2019 – 31/3/2022	By YR4 (30/9/2023)
S01	Provision of new job opportunities for highly educated researchers/ scientists and highly skilled technical staff in Cyprus	The number of research and technical staff that are employed at the ECoE. Salaries paid (€)	12 (The ECoE management team was appointed) FTE=3.06 from CUT 9 positions for researchers and technicians announced (31 applications received)	<b>7 researchers and technical/ administrative personnel. €48,973</b>	<b>19 researchers and technical/ administrative personnel. €48,973</b>	50 researchers, administrative and technical staff
S02	Provision of new job opportunities for highly educated researchers/scientists and skilled technical staff in Cyprus to people from abroad	Percentage of the research and technical staff attracted from abroad	In progress (9 positions for researchers and technicians announced and 31 applications received)	<b>14.3%</b>	<b>14.3%</b>	10-20%
S03	Continuous interaction with stakeholders nationally, in the EMMENA region and in Europe through dedicated events	Number of events (workshops, info days, etc.) that the ECoE organised/participated	86	<b>68</b>	<b>154</b>	150
S04	Establishment of new partnerships with public authorities, the industry, and SMEs in the EO domain locally and across the EMMENA region, Europe and beyond	Number of meetings with local authorities, public and private stakeholders, academia, etc.	20	<b>25</b>	<b>45</b>	11
S05	Development and provision of services/ tools in collaboration with local/ EMMENA stakeholders/ public authorities based on their specific needs	Number of services developed for the needs of public authorities/industry	4 (1 pending)	<b>2 (3 pending)</b>	<b>6</b>	5
S06	Capitalisation on existing and new partnerships with stakeholders from public authorities in the domain of EO technologies	Number of stakeholders from public authorities that participated in research proposals together with the ECoE	27	<b>39</b>	<b>66</b>	15
S07	Capitalisation on existing and new partnerships with stakeholders from	Number of stakeholders from industry that participated in	14	<b>63</b>	<b>77</b>	10



**Impact: Society**

#	Key Performance Indicator (KPI)	Metric	Progress (Separately for each period)		Progress (Cumulative)	Target
			During RP1	During RP2	1/10/2019 – 31/3/2022	By YR4 (30/9/2023)
	industry in the domain of EO technologies	research proposals/tenders together with the ECoE				
S08	Promotion of spin-off creation and entrepreneurship culture in EO businesses in Cyprus and in the EMMENA region	Number of start-ups and/or spin-offs created utilising products or expertise gained from the ECoE Research Areas	In progress (Meetings with CyRIC, GRAVITY incubator; ESA BIC)	<b>In progress (Meetings with CyRIC, GRAVITY incubator; Space BIC)</b>	<b>In progress (Meetings with CyRIC, GRAVITY incubator; Space BIC)</b>	0
S09	Involving civil society and citizens, to influence the adaptation of the culture to the new technological EO environment through responsible research and innovation activities	Number of activities targeting to non-academic audiences to increase of scientific culture of the country	25	19	44	10





## 4 Overall Impact

As presented in detail in *section 2* and in the summary *Table 10* of this report, the ECoE during RP2, and continuing the same trend of RP1, had the greatest impact, in relation to the KPIs, on **Society**. Based on the various KPIs and their metrics in the specific impact section, the ECoE has significantly exceeded the year 4 target of the EXCELSIOR project (*Figure 31*). More specifically, ECoE, during RP2, participated in and/or organised 68 events, in addition to the 86 events of RP1, surpassing the goal of 150 events set by the 4<sup>th</sup> year of the EXCELSIOR project. From these events, 25 meetings (45 meetings in total, i.e., RP1 and RP2) were with stakeholders from the public and private sector, exceeding the goal of 11 meetings by YR4 of the project. These meetings and other networking events have led to the development of 6 services by the end of RP2, surpassing the YR4 goal of 5 services, and the formulation of overall 66 partnerships with public authorities and 77 partnerships with stakeholders from the private sector, in the form of research project proposals, exceeding the year 4 goals of 15 and 10 partnerships respectively.

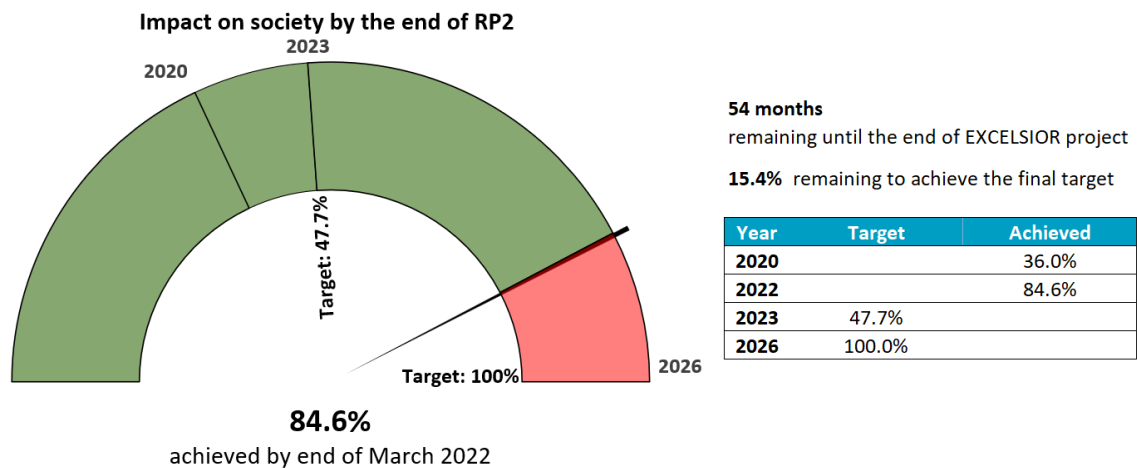


Figure 31: ECoE's impact on society by the end of RP2 and the goals of EXCELSIOR project

Last, 44 activities targeting to non-academic audiences were organised by RP2 to increase of scientific culture of the country, exceeding the YR4 goal of 10 activities. Significant progress was also made for the development of the Space BIC, although no start-up/spin-off is expected to be formed by YR4. However, the employment of 7 new personnel during RP2, on top of 12 people appointed as the ECoE Management Board during RP1, was well below the YR4 target of 50, as the employment of new personnel started just recently, following the contract amendment of the EXCELSIOR project.

Regarding the impact on **Scientific community**, the ECoE has progressed significantly in comparison with RP1 and is on its way to accomplish the goals set for the year 4 of the EXCELSIOR project (*Figure 32*). The number of journal articles and the number of oral/poster presentations in international conferences/workshops appear to meet the proposed targets set by year 4 of the project. More specifically, 37 journal papers were published, and 22 oral/poster presentations were conducted by ECoE staff. During RP2, 15 conference papers were also published, showing lower performance in comparison to RP1, when 32 conference papers were published by the Research Centre. All the above have led to 285 citations in Scopus and 395 citations in Google Scholar since 1 October 2019. The YR4 goal of 3000 citations seems distant, however the cumulative nature of the citations makes it difficult



to predict how rapidly these figures will change over time. Additionally, the employment of new researchers, and the conduct of new research are expected to contribute significantly to the increase of h-index.

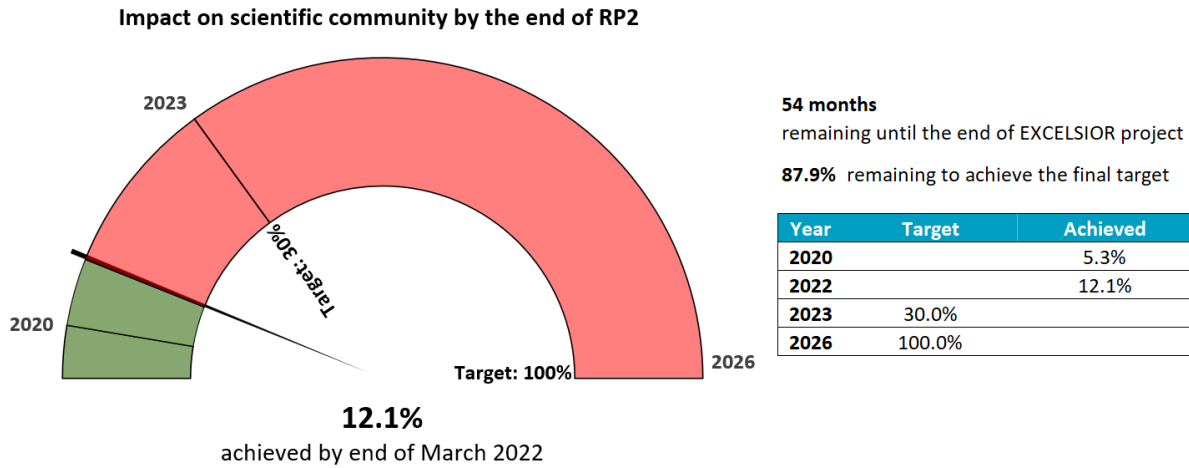


Figure 32: ECoE’s impact on scientific community by the end of RP2 and the goals of EXCELSIOR project

Due to the status of the Centre, no personnel visited and/ or used the ECoE facilities and no ECoE personnel was seconded to other organisations during RP2. This is expected to change soon, with the employment of new staff that is currently ongoing. Finally, progress is being made in terms of patents’ development, and the creation of start-ups/spin-offs, although none is expected to happen by YR4 of the project.

The lowest impact in relation to the KPIs is in terms of **Participating organisations**, with the ECoE having improved in comparison with what was achieved during RP1, but there is still a long way towards reaching the goals set by year 4 of the EXCELSIOR project (Figure 33).

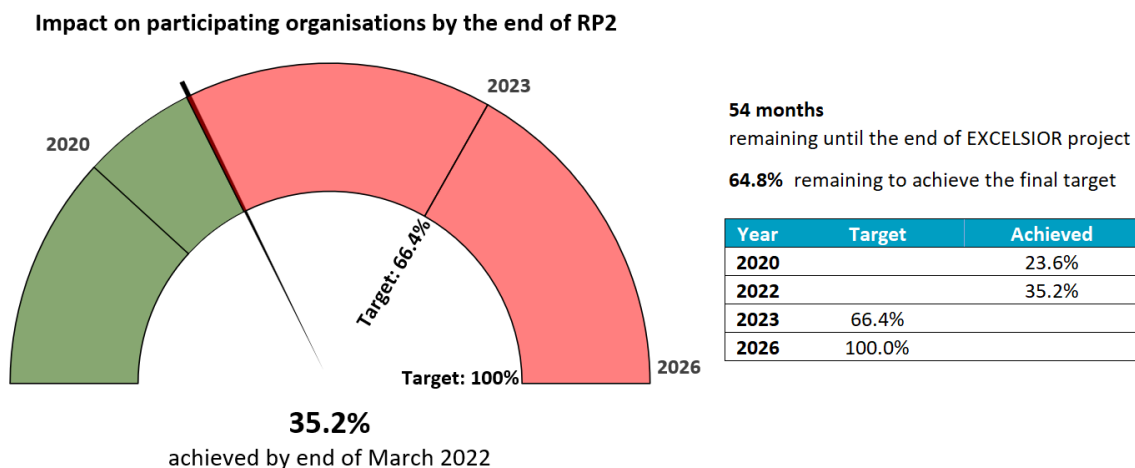


Figure 33: ECoE’s impact on participating organisations by the end of RP2 and the goals of EXCELSIOR project

There were delays in the establishment of the satellite ground receiving station, the GBS and the purchase of other equipment. This is because the preparation of paperwork for tenders is quite challenging and time consuming. Taking into account that the ECoE is at a very early stage, it is



expected that the activities that are planned to be carried out in the next years will achieve the goals set at a later stage. Additionally, there was low impact in terms of new employments, as previously discussed, with 3 researchers starting their employment during RP2, compared to the YR4 goal of 40 researchers. This issue is strongly linked with the delay of the contract amendment, which was initiated in March 2021 and was approved in January 2022. Currently, the employment process is under way with numerous interviews being conducted, to identify appropriate candidates for the various ECoE's vacancies. Additionally, no exceptional researchers (MSC Fellows, ERC, etc.) were hosted at the ECoE. Moreover, during RP2, twenty-eight postgraduate students (MSc and PhD) have used RI and facilities of CUT/ECoE for their thesis, with 3.57% being from Greece. This is expected to meet the YR4 goal of 80 postgraduate students, as by the end of RP2, a total of 69 postgraduate students have registered annually.

Significant progress was observed through the signing of sixteen MoUs, 12 with local/national and 4 with international stakeholders, during RP2. It is expected to meet the goal of 26 MoU (20 with local and 6 with international stakeholders) by year 4. The signed MoUs are expected to increase the engagement of stakeholders and facilitate collaboration with them, leading to new funding opportunities. Overall, 36 project proposals were submitted during RP2 (74 in total by the end of RP2) through partnerships with other universities, research institutes, public authorities, governmental departments, industry, and other organisations, falling lower than the target of 180 proposals by year 4, i.e. 45 proposals per year, of the EXCELSIOR Phase 2 project. Six (6) of these proposals were funded securing €245,389.60 by the end of RP2. This amount is significantly lower than the target of €5 million set by year 4 of the project.

Furthermore, very little progress has been made in terms of participation in Research Institute networks and calibration/validation networks, with the exception of participating as Associate partner in the ACTRIS IMP network. However, progress has been made for the participation of the ECoE in various networks, such as Copernicus Academy, NEREUS, ISPRS, etc. The YR4 goals have already been surpassed during RP1. During RP2, there were no external participants in professional skills development programs offered by the ECoE. The professional skills development programs are expected to be developed during the next reporting period (RP3), aiming to attract approximately 40 participants from the public and private sector. Additionally, no collaborating networks/institutions have requested access to the ECoE's data for calibration and validation. Last, the h-index of the group consisting of 33 researchers, is 7 in Scopus and 9 in Google Scholar. The YR4 target of 30 seems distant; however, the cumulative nature of the h-index makes it difficult to predict how rapidly this figure will change over time. Moreover, the employment of new researchers, and the conduct of new research are expected to contribute significantly to the increase of h-index.

As the KPI metrics are for a 7-year period, it is to be expected that not all KPIs will be fulfilled during RP1 or RP2. Most of the goals set through the KPIs were met or even exceeded during the RP2. Overall, by the end of RP2, i.e., 31 March 2022, the ECoE has progressed significantly and has almost reached the 4<sup>th</sup> year goal of the EXCELSIOR project (*Figure 34*). However, the results of this deliverable clearly indicated that the following KPIs need to be further developed in the coming RP3, as seen in *Table 11*.

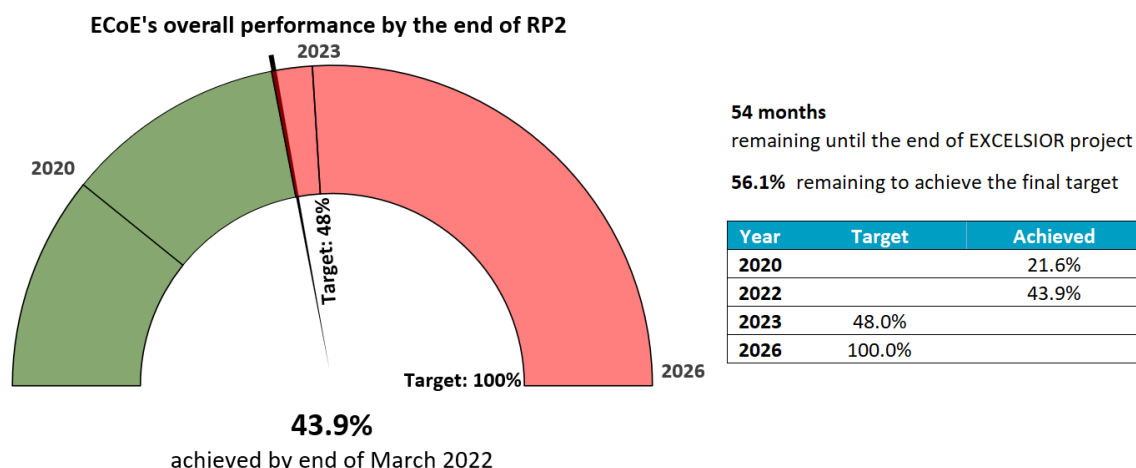


Figure 34: ECoE's overall impact by the end of RP2 and the goals of EXCELSIOR project

Table 11: Current status of KPIs (RP2) and future goals (RP3)

KPI	Current status (RP2)	Next reporting period (RP3)
<b>P01:</b> The acquisition of all necessary equipment that are essential to conduct cutting-edge research and create applications	The tender for the satellite ground receiving station is being finalised at the moment and is expected to be issued in approximately 2 months. In the case of the GBS, the tender was issued, and results/ prices are expected by end of February 2022. Last, market research is currently in progress for the purchase of equipment for the operation of research facilities of the ECoE.	It is expected that the activities that are planned to be carried out in the next reporting period will achieve the goals set at a later stage.
<b>P05a:</b> Number of researchers employed (FTE)	In total, 3 researchers were employed during the RP2. This value is well below the 40 researchers that are expected to be employed by year 4 of the project.	The employment process is under way, following the approval of the project's contract amendment. Many interviews are being conducted, to identify appropriate candidates for the various ECoE's vacancies, expecting to meet the YR4 goal.
<b>P05b:</b> Hosting of Researchers (MSC Fellows, European Research Council grants ERC)	No MSC Fellows and ERC researchers were attracted by the ECoE.	it is reasonable not to attract any exceptional researchers from abroad yet. This is expected to change in the coming years, with the target of 4 MSC Fellows being reasonable by YR4.
<b>P07:</b> External participants in professional skills development programs offered by the ECoE	No external participants in professional skills development programs offered by the ECoE	The professional skills development programs are expected to be developed during the next reporting period (RP3), aiming to attract approximately 40 participants from the public and private sector.
<b>P10a:</b> Research project proposals submitted for funding	A total of 74 research project proposals have been submitted for funding by the end of RP2 (i.e. over 3 years), falling below the average 45 proposals per year.	It is expected to approach the goal of 180 research proposals by YR4. At the same time, ECoE is right on target in terms of successful research project proposals.



KPI	Current status (RP2)	Next reporting period (RP3)
<b>P10c:</b> Total amount of funds received from the successful submission of research project proposals	€245,389.60 have been secured by end of RP2, falling short of the YR4 target.	The decision for some of the project proposals is still pending. Additional funding is expected to be received through the development of services and the provision of professional skills development to external participants.
<b>P11:</b> h-index from ECoE related publications (Scopus, Google scholar)	An h-index 7 in Scopus and 9 in Google Scholar was achieved by RP2.	The cumulative nature of the h-index and the employment of new researchers is expected to increase this figure significantly.
<b>R07:</b> Number of PhD graduates trained on ECoE RI and facilities	3 recent PhD graduates and 12 Postdoctoral Research Fellows have trained on CUT/ECoE RI and facilities during RP1.	The announcement of new PhD positions every year and the co-supervision of PhD students from abroad is expected to increase this value and meet the goal of 30 PhD graduates by year 4 of the project.
<b>SC02:</b> Articles published in the proceedings of International Conferences	47 conference papers were published by the end of RP2, i.e. 32 in RP1 and 15 in RP2.	It is expected that with the end of the COVID-19 pandemic, there will be more active participation in international conferences, so that the target of YR4 is met.
<b>SC03:</b> Citations on ECoE related publications	285 citations in Scopus and 395 citations in Google Scholar by RP2.	The cumulative nature of the citations and the employment of new researchers, conducting research at the ECoE are expected to increase this figure significantly.
<b>SC05:</b> Personnel visiting and/ or using the ECoE facilities and ECoE personnel seconded to other organisations	No secondments were carried out during RP2. A secondment of a researcher was planned to TROPOS, but unfortunately it was cancelled due to COVID-19 (tickets paid)	This is expected to change soon, with the employment of new staff that is currently ongoing.
<b>S01:</b> Research and technical staff that are employed on a full-time basis (FTE) at the ECoE	The ECoE management team was appointed during RP1, and 7 researchers and technical/ administrative personnel were employed during RP2, falling short of the 50 people, research and administrative/technical staff, that are expected to be employed by year 4 of the project.	Employment of new personnel started just recently, following the contract amendment of the EXCELSIOR project.



## 5 Conclusions

This report establishes the impact assessment monitoring of the impact of the different activities carried out by the ECoE against a set of quantified targets in order to determine if the KPIs have been met. KPIs require effective metrics in order to provide reliable and valid measurements of the impact, as indicated in the list of Key Performance Indicators. The impact monitoring report will be re-assessed in every reporting period to determine any changes that are necessary for effective impact monitoring.

Even though the KPIs featured are for years 1-4, there were very good results within RP2. This is especially notable, as the Covid-19 pandemic affected networking and events. However, such activities were carried out via teleconferencing and media, which proved to be effective.



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## Appendix A



2/6/2021

**Prof. Diofantos Hadjimitsis**

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To:

**Permanent Secretary, Dr. Stelios Himonas**  
Deputy Ministry of Research, Innovation and Digital Policy

Attention of:

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**Letter of Commitment of the ERATOSTHENES CENTRE OF EXCELLENCE OF THE CYPRUS UNIVERSITY OF TECHNOLOGY (EXCELSIOR H2020 TEAMING) for covering part of the Operation support for the ACTRIS Membership contribution for Cyprus**

This Letter of Commitment expresses the concrete commitment of the Eratosthenes Centre of Excellence to cover the “Operation Support” part of the contribution for the ACTRIS membership for the period 2021-2025, as well as for the full operational phase from 2026 and beyond, corresponding to the one National Facilities operating under **ERATOSTHENES Centre of Excellence, the Cyprus Atmospheric Remote Sensing Observatory CARO at the Cyprus University of Technology / ERATOSTHENES Centre of Excellence**

Eratosthenes Centre of Excellence will be supporting the ACTRIS Membership Contribution for Cyprus as per “**Table 1- Estimated membership contributions for 2021–2025 and for the operation phase for Cyprus in [€], including breakdown of costs for the operation support part for each National Facility**” below, provided by the Deputy Ministry on the 26<sup>th</sup> May, 2021: (see yellow marking)



**Table 1.** Estimated membership contributions for 2021–2025 and for the operation phase for Cyprus in [€], including breakdown of costs for the operation support part for each National Facility. Note: The annual membership contributions for each year depend on the foreseen labelling year of the NFs, as announced by the countries.

Year / organization	NF	Contr. General Support	NF based. Operation Support	Tot. Memb. contr.
<b>2021</b>		<b>38 766</b>	<b>32 643</b>	<b>71 409</b>
The Cyprus Institute	Cyprus Atmospheric Observatory CAO*		17 213	
The Cyprus Institute	Unmanned Systems Research Laboratory USRL**		3 059	
Eratosthenes Centre of Excellence of the Cyprus University of Technology	Cyprus Atmospheric Remote Sensing Observatory CARO***		12 371	
<b>2022</b>		<b>51 477</b>	<b>32 668</b>	<b>84 145</b>
The Cyprus Institute	Cyprus Atmospheric Observatory CAO		17 225	
The Cyprus Institute	Unmanned Systems Research Laboratory USRL**		3 072	
Eratosthenes Centre of Excellence of the Cyprus University of Technology	Cyprus Atmospheric Remote Sensing Observatory CARO***		12 371	
<b>2023</b>		<b>56 480</b>	<b>33 097</b>	<b>89 577</b>
The Cyprus Institute	Cyprus Atmospheric Observatory CAO		17 205	
The Cyprus Institute	Unmanned Systems Research Laboratory USRL**		3 522	
Eratosthenes Centre of Excellence of the Cyprus University of Technology	Cyprus Atmospheric Remote Sensing Observatory CARO***		12 371	
<b>2024</b>		<b>62 504</b>	<b>33 372</b>	<b>95 876</b>
The Cyprus Institute	Cyprus Atmospheric Observatory CAO		17 479	
The Cyprus Institute	Unmanned Systems Research Laboratory USRL**		3 522	
Eratosthenes Centre of Excellence of the Cyprus University of Technology	Cyprus Atmospheric Remote Sensing Observatory CARO***		12 371	
<b>2025</b>		<b>70 818</b>	<b>33 459</b>	<b>104 277</b>
The Cyprus Institute	Cyprus Atmospheric Observatory CAO		17 573	
The Cyprus Institute	Unmanned Systems Research Laboratory USRL**		3 515	
Eratosthenes Centre of Excellence of the Cyprus University of Technology	Cyprus Atmospheric Remote Sensing Observatory CARO***		12 371	
<b>Full Operation Phase (2026-), indicative</b>		<b>73 973</b>	<b>33 568</b>	<b>107 541</b>
The Cyprus Institute	Cyprus Atmospheric Observatory CAO		17 675	
The Cyprus Institute	Unmanned Systems Research Laboratory USRL**		3 522	
Eratosthenes Centre of Excellence of the Cyprus University of Technology	Cyprus Atmospheric Remote Sensing Observatory CARO***		12 371	



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 857510



**\* Cyprus Atmospheric Observatory (CAO) of The Cyprus Institute: aerosol in situ, aerosol remote sensing, reactive trace gases in situ (all components estimated to be ready for labelling 2021)**

**\*\* Unmanned Systems Research Laboratory (USRL) of The Cyprus Institute: aerosol in situ (estimated to be ready for labelling 2021)**

**\*\*\* Cyprus Atmospheric Remote Sensing Observatory CARO of Cyprus University of Technology & ERATOSTHENES Centre of Excellence: aerosol remote sensing, cloud remote sensing (all components estimated to be ready for labelling 2021)**

The Eratosthenes Centre of Excellence (ECoE) has already evidenced clear commitment towards providing tangible support towards the ACTRIS Membership. A provision of an annual contribution of the ERATOSTHENES OF EXCELLENCE to the Research Infrastructure (ACTRIS) has been approved by the Executive Committee of the ECoE based on the recommendation of our strategic partner TROPOS and the strategic activities that are stated at the EXCELSIOR H2020 TEAMING PROJECT (G.A 857510). The above commitment stems also from the EXCELSIOR H2020 TEAMING PROJECT Grant Agreement (G.A 857510). See below some statements from the G.A.:

*Needs refer to existing and projected local priority necessities for Excellence:*

**N1. Supersite for aerosol and cloud monitoring in the EMMENA.** *There is a clear and strong demand for EO monitoring to provide data to evaluate the extent of pollution and climate change, especially in the EMMENA region. The European observational research and monitoring network infrastructure for aerosol and cloud monitoring (organised within the infrastructure project ACTRIS-2) is clearly misses a supersite in the Eastern Mediterranean. Cyprus is located at the crossroads of aerosol and pollution transport, where it can also examine complex aerosol-cloud-rain relationships. The ECoE, with the relevant EO infrastructure, can provide the necessary tools to examine the regional pollution, dust outbreak, and weather predictions in the region, providing the environmental and meteorological departments/stakeholders with relevant data.*

*The EMMENA region is a unique area where anthropogenic pollution, desert dust and clouds mix. Cyprus provides the opportunity to perform state-of-the-art studies to shed light into the basic processes of precipitation formation. European networks of atmospheric research (EU ACTRIS initiative) require a cornerstone (observational supersite) in EMMENA. The GBS will connect the ECoE with major European infrastructures for remote sensing, such as ACTRIS, EARLINET...*

The aforementioned co-funding will provide Cyprus the opportunity to be part of this strategic EU Research Infrastructure and to advance knowledge transfer and enhance collaboration in the field.

Sincerely,

Prof. Diofantos Hadjimitsis

Managing Director of the ERATOSTHENES CoE  
Coordinator of the EXCELSIOR H2020 TEAMING PROJECT/ Professor at the CYPRUS UNIVERSITY OF TECHNOLOGY

Prof. Evangelos Akylas  
Chairman of the BOD of the ERATOSTHENES CoE

c.c. BOD members of the ERATOSTHENES CoE  
Executive Committee, Research Coordinator, Infrastructure Coordinator and Functional Area Manager of the ERATOSTHENES CoE