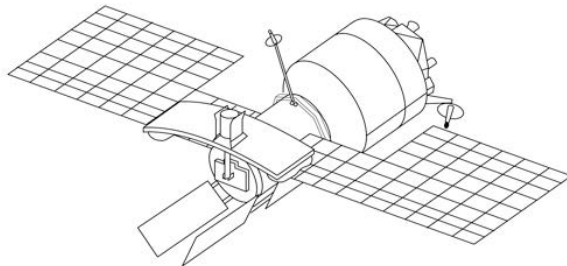




BE OND

Exploitation of BEYOND capacities



Ioannis Papoutsis
IAASARS
National Observatory of Athens



One Step BEYOND Workshop,
15/10/2015
ESA, Frascati



FP7-Regpot-2012-23-1

BEYOND Center of Excellence

**Experienced
researchers**

Infrastructure

Partnerships

Visibility

Exploitation dimensions



- New projects
- Increase scientific output
- Links with international initiatives
- Strategic collaborations
- Expansion of user base
- Awards, distinctions, achievements

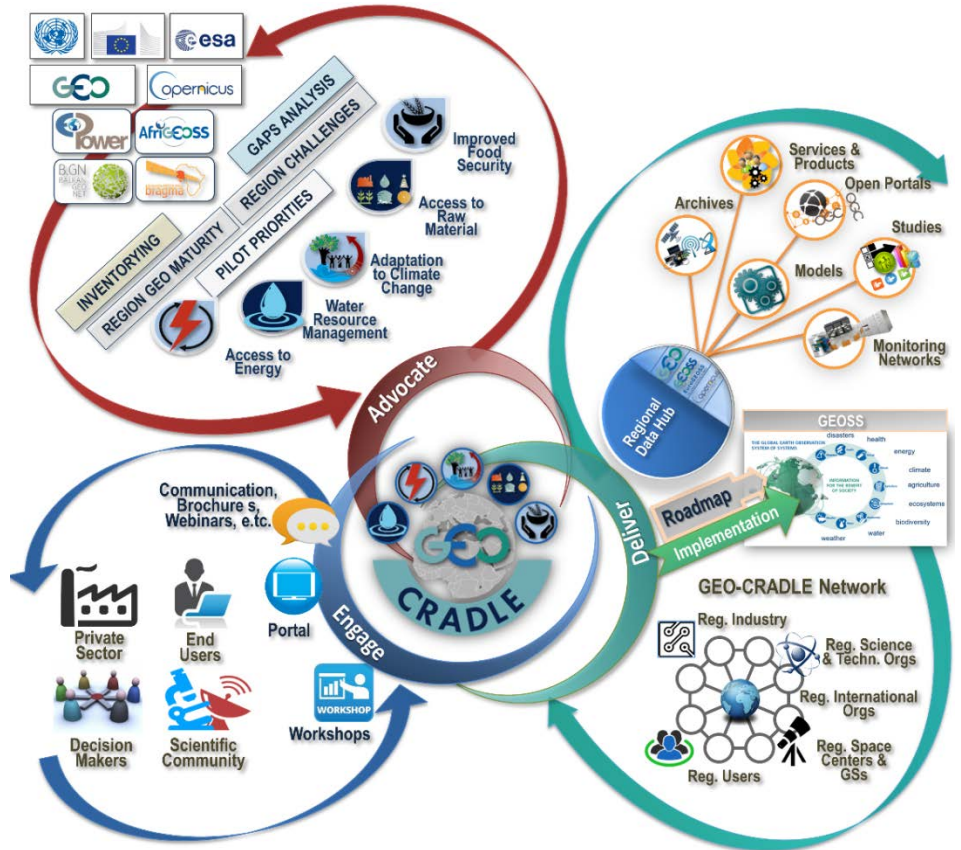
New projects

Key info

- GEO-CRADLE
- H2020
- Coordinator
- 800k€
- Multi-hazard

COORDINATING AND INTEGRATING STATE-OF-THE-ART EARTH OBSERVATION ACTIVITIES IN THE REGIONS OF NORTH AFRICA, MIDDLE EAST, AND BALKANS AND DEVELOPING LINKS WITH GEO RELATED INITIATIVES TOWARDS GEOSS

- Objective: Establish a multi-regional coordination network to support the effective integration of existing EO capacities



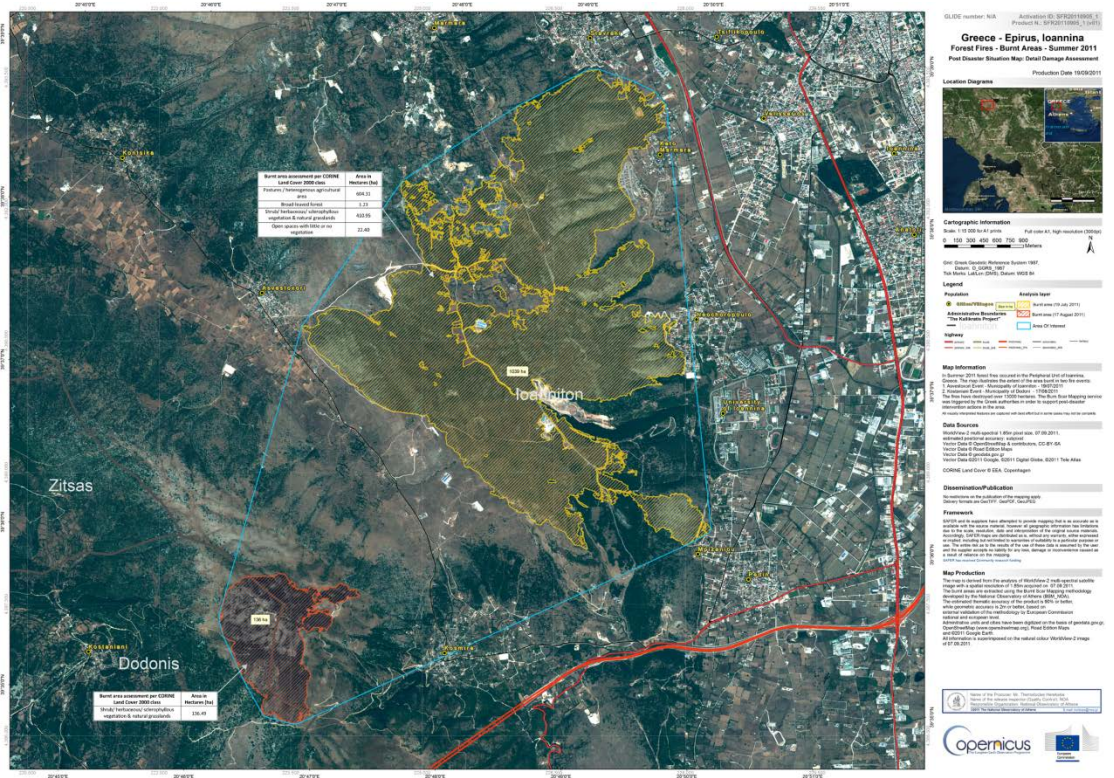
New projects

Key info

- EMS
- JRC
- Partner
- 800k€
- Multi-hazard

Copernicus Emergency Management Service – Risk & Recovery

- Objective: on-demand provision of geospatial information in support to emergency management activities during the phases of the emergency management cycle which are not related to the immediate response



New projects

Key info

CHARADMexp

ESA

Coordinator

50k€

Atmospheric

Characterization of Aerosol Mixtures of Dust and Marine Origin

- Objective: Derive optical, microphysical and chemical properties of marine component and its mixture with dust
- Use of sophisticated instrumentation
 - ground-based active/passive remote sensing techniques
 - surface in-situ measurements
 - airborne UAV observations
- Campaign at Finokalia, Crete, Greece



New projects

Key info

DEDICAtE

ESA

Coordinator

90k€

Atmospheric

Development of a dual-channel Depolarization lidar technique for the derivation of CALIPSO/Aeolus/EarthCARE-related conversion factors

- Objective: Improve the specifications of the ESA-EMORAL mobile lidar for dual-depolarization observations
- Develop a 355nm depolarization climatology from CALIPSO



Key info

MULTIPLY

ESA

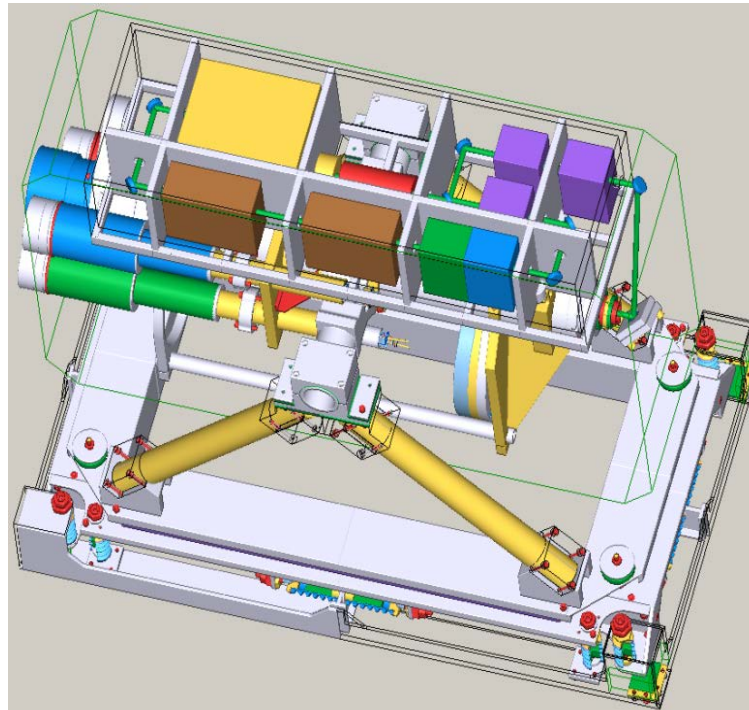
Partner

230k€

Atmospheric

Development of a European HSRL airborne facility

- Objective: Develop the first multi-wavelength airborne High Spectral Resolution Lidar (HSRL) in Europe
- Use for validation of the lidar Earth Explorers ADM-Aeolus and EarthCARE



New projects

Key info

Hyflex

ESA

Partner

10k€

Atmospheric

Verification of the Hyperspectral Plant Imaging Spectrometer for FLEX mission

- HyPlant is a narrow-band imaging sensor for passive monitoring of sun-induced fluorescence in the O₂ absorption bands
- Objective: Test and verify the performance of the Hyperspectral Plant Imaging Spectrometer



Key info

MarcoPolo

FP7 - Space

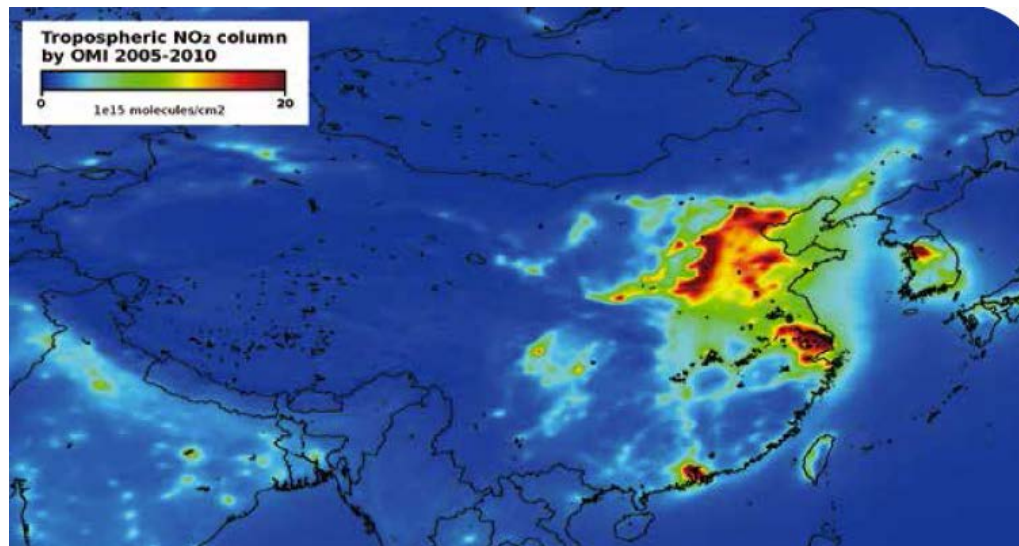
Partner

100k€

Atmospheric

Monitoring and Assessment of Regional Air Quality in China using space Observations

- Objective: Estimate emissions from space and apply spatial downscaling
- Distinction between anthropogenic and biogenic sources
- Create up-to-date emission inventories



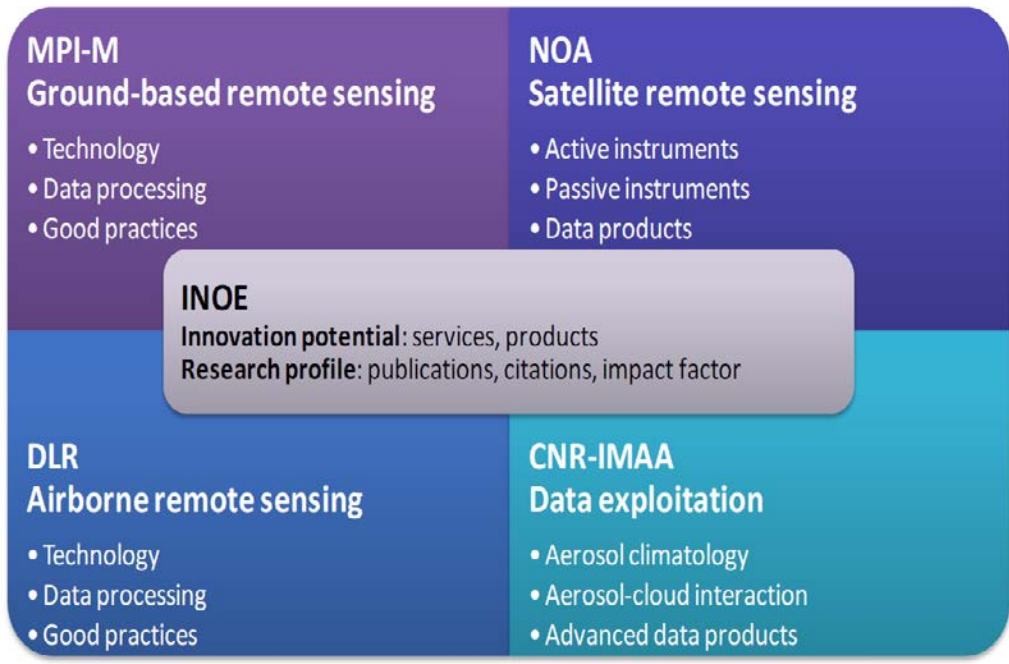
New projects

Key info

- ECARS
- H2020
- Partner
- 170k€
- Atmospheric

East European Centre for Atmospheric Remote Sensing

- Objective: Boost INOE's (Romania) research capacity in atmospheric remote sensing
- Know-how transfer



New projects

Key info

ACTRIS-2

H2020

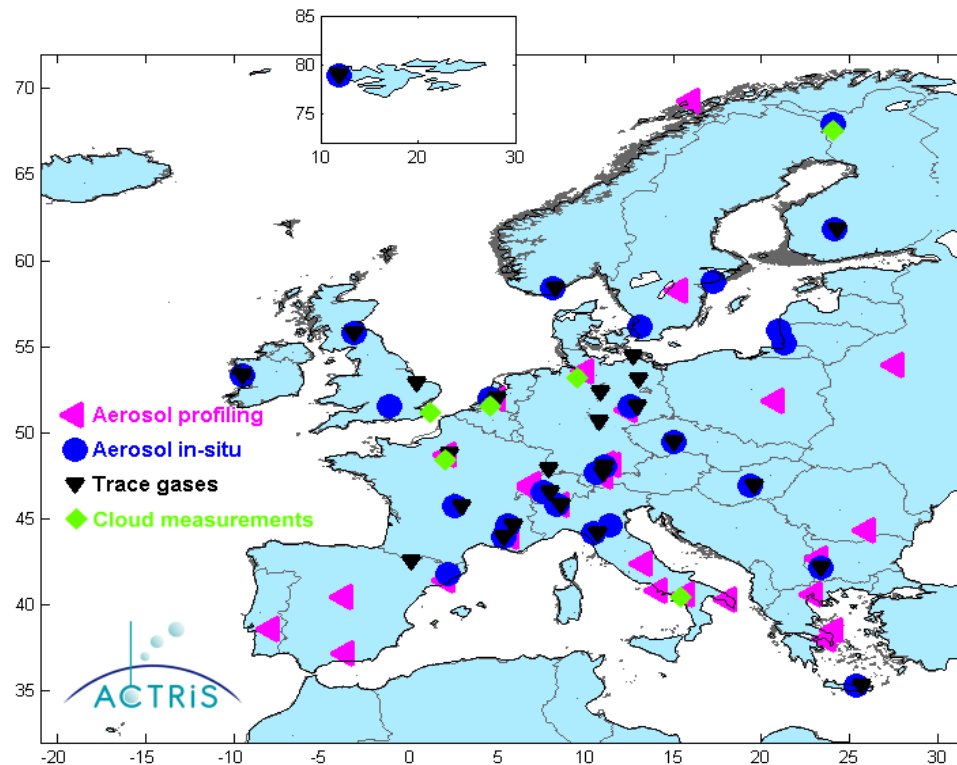
Partner

100k€

Atmospheric

Aerosols, Clouds, and Trace gases Research InfraStructure

- Objective: Integrate the European ground-based stations equipped with advanced atmospheric probing instrumentation for aerosols, clouds, and short-lived gas-phase species
- Continuation from ACTRIS-1



New projects

Key info

TREASURE

DG ECHO

Partner

100k€

Urban Env.

Thermal Risk rEduction Actions and tools for SecURE cities

- Objective: Integrate the expertise of epidemiologists, climatologists, Earth Observation scientists and IT developers into intelligent heat wave risk assessments
- Target authorities and personalised tools for citizens

Heat Wave Hazard Appraisal



To assess the past, present and future heat wave hazard by means of satellite measurements, long time series of meteorological station data as well as the best available climatologic models.

Health Impact Assessment



To integrate health impacts related to heat waves into the TREASURE, to guarantee a holistic innovative approach.

Services To Authorities



To provide services to Authorities to reinforce urban resilience to heat waves.

Services To Citizens



To provide personalised heat wave risk estimations to citizens.

New projects

Key info

ESA-DRR

ESA

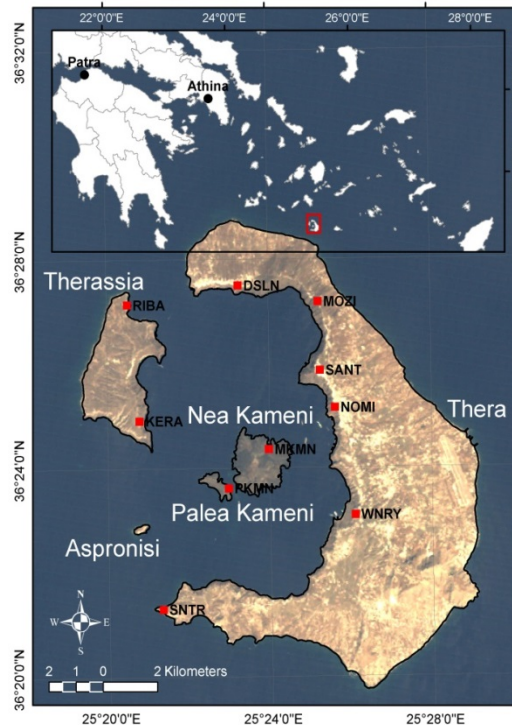
Partner

75k€

Geohazards

Disaster Risk Reduction using innovative data exploitation methods and space assets

- Objective: Study the expansion of the use of space technologies and ICT assets, focusing on cloud environments
- Address earthquakes, volcanoes, floods
- Use of novel processing platforms - GEP



New projects - Summary



- ✓ 30 proposals
- ✓ 11 new projects
=> 36% success rate
- ✓ 2.5M€

BEYOND's scientific output

Significant publications



- Amiridis et al., LIVAS: a 3-D multi-wavelength aerosol/cloud database based on CALIPSO and EARLINET, **Atmospheric Chemistry and Physics**, 15, 7127-7153, 2015
- Solomos et al., Smoke dispersion modeling over complex terrain using high resolution meteorological data and satellite observations – The FireHub platform, **Atmospheric Environment**, Volume 119, 348-361, 2015
- Sismanidis et al., Evaluating the Operational Retrieval and Downscaling of Urban Land Surface Temperatures. **IEEE Geoscience and Remote Sensing Letters**, 12(6), 1312-1316, 2015
- Merryman Boncori et al., The February 2014 Cephalonia Earthquake (Greece): 3D Deformation Field and Source Modeling from Multiple SAR Techniques, **Seismological Research Letters**, 86 (1), 2015
- Potirakis et al., Signatures of the self-affinity of fracture and faulting in pre-seismic electromagnetic emissions, **Nat. Hazards Earth Syst. Sci. Discuss.** 2, 2981–3013, 2014

BEYOND's scientific output

Summary



Journals	15
Workshops & conferences	39

Links with international initiatives



- **GEO**, see Evangelos Gerasopoulos presentation on BEYOND's regional follow up activities
 - GEO SB-04: Global Urban Observation and Information
 - GEO DI-01: Informing Risk Management and Disaster Reduction
- Regional Support Office (**RSO**) of **UN-SPIDER**:
 - Make available space-based resources for disaster management and emergency response
 - Capacity building & outreach
- Member of the **CEOS Seismic Pilot** for developing and demonstrating advanced science products for rapid earthquake response
- Member of the **NASA-AERONET** network for the provision of calibrated aerosol measurements over Athens for climate change and satellite cal/val activities
- Member of the **ACTRIS** European Infrastructure Network of advanced atmospheric stations, and member of the **EARLINET** lidar network
- Member of **SuperMAG** worldwide collaboration of organizations that currently operate more than 300 ground based magnetometers

- **UK MetOffice** on the collaboration and data/services exchange regarding desert dust forecast modeling
- **INOE** on the exchange of know-how on ground-based and airborne lidar operation and manufacturing, as well as EO methodologies
- **Institute of Geology & Mineral Exploration**, for the cooperation and mutual exchange of data, results and expertise, focusing on monitoring landslides
- **Earthquake Planning and Protection Organization** for monitoring urban subsidence
- Cooperation with the **Public Power Corporation** aiming at developing a methodology for operational monitoring and management of flood risks

Best Service Challenge of the Copernicus Masters 2014 for **FireHub** - Patent pending



Our flagships



1. FireHub: A Space Based Fire Management Hub
2. Smoke dispersion services
3. Operational real time system for Continuous Monitoring of the Urban Thermal Environment
4. UAV based damage assessment
5. Mapping of large-scale ground velocities
6. Geomagnetic data portal
7. Floods Observatory for south-eastern Europe

- Disaster Hub: EO-based multi-disaster monitoring, coupled with crowdsourcing information
- Saharan dust forecasts
- Urban Thermal Monitoring as a downstream service in new application areas (Health, Fitness, Environment, Heat stress, Energy, Smart Cities)
- Near-real time InSAR applications using Sentinel Collaborative Ground Segment
- Floods Early Warning System