New technologies for acquiring in-situ observation datasets to address climate change effects
6 projects funded
under 2022 - CL6-GOVERNANCE-01-7

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European Research Exective Agency

HELLENIC REPUBLIC
MINISTRY OF DEVELOPMENT AND INVESTMENTS
GSRI
GENERAL SECRETARIAT FOR RESEARCH AND INNOVATION

European Commission

EUROGEO WORKSHOP 2022

POLICY CONTEXT

Need for

- Development of new technologies addressing **the lack of ground observation (in-situ observation) in hard-to-reach under-sampled areas**
- A strengthened Global Earth Observation System of Systems **(GEOSS)**
- Deploying and adding value to environmental observation

EXPECTED OUTCOMES

- ✓ **Lower cost** of in-situ observation in terms of capital cost, deployment/recovery
- ✓ Improved **geographical coverage and long-time series** of in situ environmental observations;
- ✓ **Tested and validated new in-situ measurement technologies in hard-to-reach under-sampled areas**
- ✓ **Dedicated technical protocols** ensuring validation, interoperability, and synchronisation **between in-situ and remote sensing systems in compliance with the GEOSS and Copernicus requirements**
- ✓ Established collaboration with **environmental observation data providers** to ensure proper gap filling
- ✓ Coherent **business model(s)** involving industrialists, research centres, and users ensuring the sustainability of systems developed
- ✓ Contribute to **reinforcing the in-situ component**

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EUROGEO WORKSHOP 2022

MISO

TEMBO AFRICA

EULIAA

CiROCCO

UAWOS

SYLVA

European Commission

EULIAA - EUROPEAN LIDAR ARRAY FOR ATMOSPHERIC CLIMATE MONITORING

- Coordinator: FRAUNHOFER GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCHUNG EV
- Duration: **01/2023 – 12/2026**

- High level objectives:
  1. Develop and build network of compact daylight-capable lidar systems **for atmospheric monitoring**
  2. **Demonstrate operation in areas facing extreme environments on different sites all over Europe**
  3. **Integrating currently unavailable atmospheric data in near-real-time into European databases**
  4. Develop **Roadmap to a European lidar array and future spaceborne mission**

- Focus/connection with other initiatives/ projects:
  - Monitoring of the atmosphere to fill the gap in the databases
  - Calibration and validation of other instruments including spaceborne EO
  - Technologies for remote sensing

CiROCCO - Enhancing the In-situ Environmental Observations across Under-sampled Deserts

- Coordinator: ICCS -RESEARCH UNIVERSITY INSTITUTE OF COMMUNICATION AND COMPUTER
- Duration: **03/2023 – 02/2026**

- High level objectives:
  - Establish an **end-to-end sensing system**, composed of a distributed network of **cost-effective sensing nodes** coupled with state-of-the-art **data fusion** remote sensing and assimilation modelling techniques.
  - Enhance the current lack of ground observation in **desert areas** offering an **operational** and in parallel **easy** to **maintain** and - **expand** solution.
  - **Commercialisation service**s to ensure the installation's sustainability and simultaneously the FAIR management of data will support **Cross-COPERNICUS ecosystem** integration and assimilation services.

- Focus/connection with other initiatives/ projects: GEO , EuroGEO ,AfriGEO, Climate Change Working Group of GEO , Copernicus In-Situ Component , ESA , Atmosphere Science Cluster (Aeolus and Aoelus+)

UAWOS – Unmanned Airborne Water Observing System

Project Period: Feb 2023 – Jan 2027

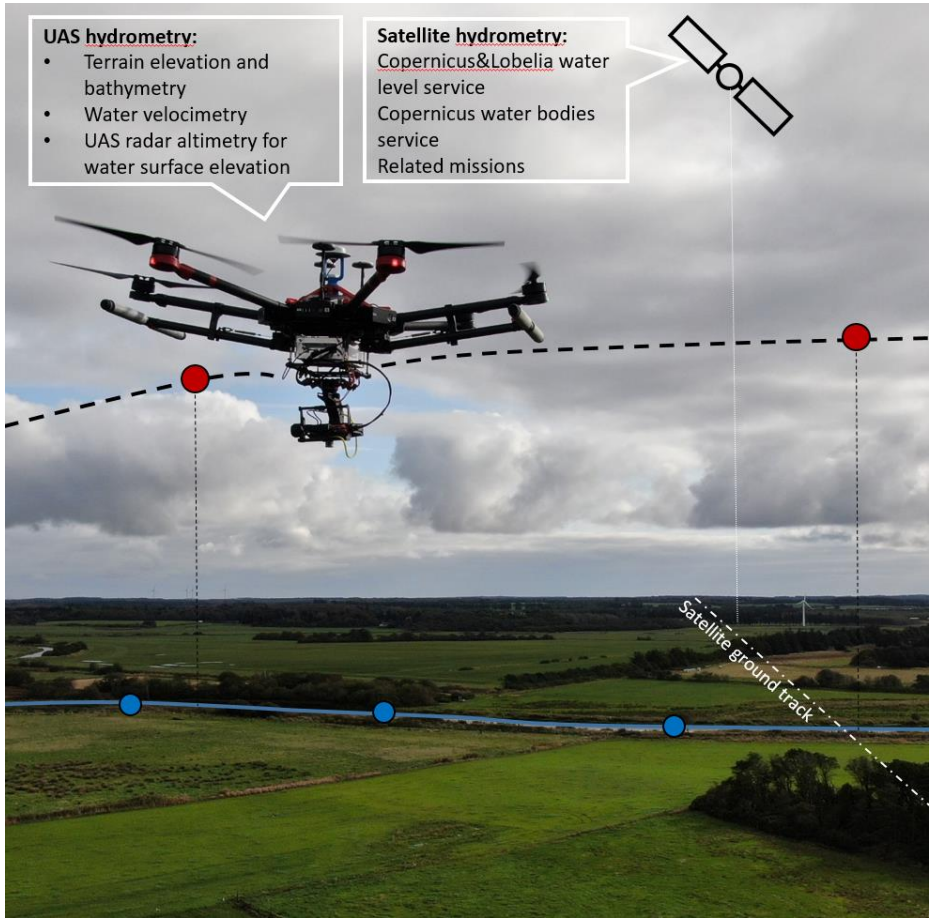
Coordinator: Technical University of Denmark,

Partners: SPH Engineering (LV), Geolux (HR), Drone Systems (DK), CNR IRPI (IT), SMHI (SE), Technical University of Munich (DE), Lobelia/isardSAT (ES)

Associated Partner: Thurn Group (UK)

UAWOS – Main Objectives:

1. Develop **radar altimetry**, **Doppler radar/laser**, **sonar** and **water penetrating radar** drone payloads
2. Develop, contactless, high-resolution, airborne mapping workflows for **water surface elevation**, **riverbed geometry**, **flow velocity** and **discharge** along rivers
3. Validate and enhance water surface elevation observations provided by the **Copernicus water level service** and the **Sentinel-6 mission**
4. Demonstrate the value of drone hydrometry datasets in **practical use cases** in the areas of climate change adaptation, flood risk analysis and surveillance, etc.
5. Establish drone hydrometry as the **"new normal" technology** for in-situ river monitoring in hard-to-reach areas



A SYstem for reaL-time obserVation of Aeroallergens

- Duration: **January 2023- December 2027**
- Coord. FMI (12 partners)
- **Primary biological aerosols** (bioaerosols: mainly pollen and fungal spores, but also bacteria and viruses) **released into the air by plants, fungi, and other biota, are strongly impacted by climate change.** They also directly **affect the climate through interactions with clouds and precipitation.** Many bioaerosols, especially pollen and some fungal spores, have **allergenic effect** on humans. Information on bioaerosols is also vital for **agriculture and forestry**, where timely data about plant development, abundance of pathogens and parasites, as well as invasive species, are necessary for precision-agriculture and knowledge-based technologies.
- To achieve **a radical improvement and fill gaps in temporal resolution, timeliness, coverage, and availability of information about aeroallergens and other bioaerosols, which are important indicators and modulators of climate change, affect human and plant health, and play a vital role in ecosystems.**

A SYstem for reaL-time obserVation of Aeroallergens

SYLVA
Observing life in air

- To achieve this goal, the project will:

- **Develop cutting-edge bioaerosol monitoring technologies**

- Create **bioaerosol monitoring ICT infrastructure and software following open-source principles and connect it to European environmental observing systems**

- Validate **the operational maturity and added-value of bioaerosol monitoring technology through Demonstration Pilots in three European regions**

- Maximise impact by demonstrating SYLVA innovations to **key stakeholders related to climate, health, agriculture, silviculture, and the environment**

- Ensure **the long-term sustainability of bioaerosol technology and infrastructure across Europe**