ATLANTIC SENSE

Towards an integrated geospatial intelligence solution

CoLAB +ATLANTIC

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ABSTRACT

As we live in an era of big data acquisition - satellite, in-situ, wearables -, climate change and environmental risks have become much easier to map. On the other hand, domain knowledge is usually supplied by the academic sector, offering novel methodologies for hazard mapping and predictions, albeit being hard to translate those scientific-driven findings for the public administration, and society at large. Hence, public policies and public domain knowledge, including the implementation and monitoring of regulatory frameworks, often lag behind the scientific state-of-the-art. As such, citizens are left 'in the dark' about the environmental or climatic risks surrounding them, even though about 40% of the world's population lives within 100km of the coast, subject to sea level rise, or exposed to other weather and climate extremes such as heatwaves and droughts. Furthermore, the pressure for further urbanisation and the efforts to preserve its rich natural capital are often at odds.
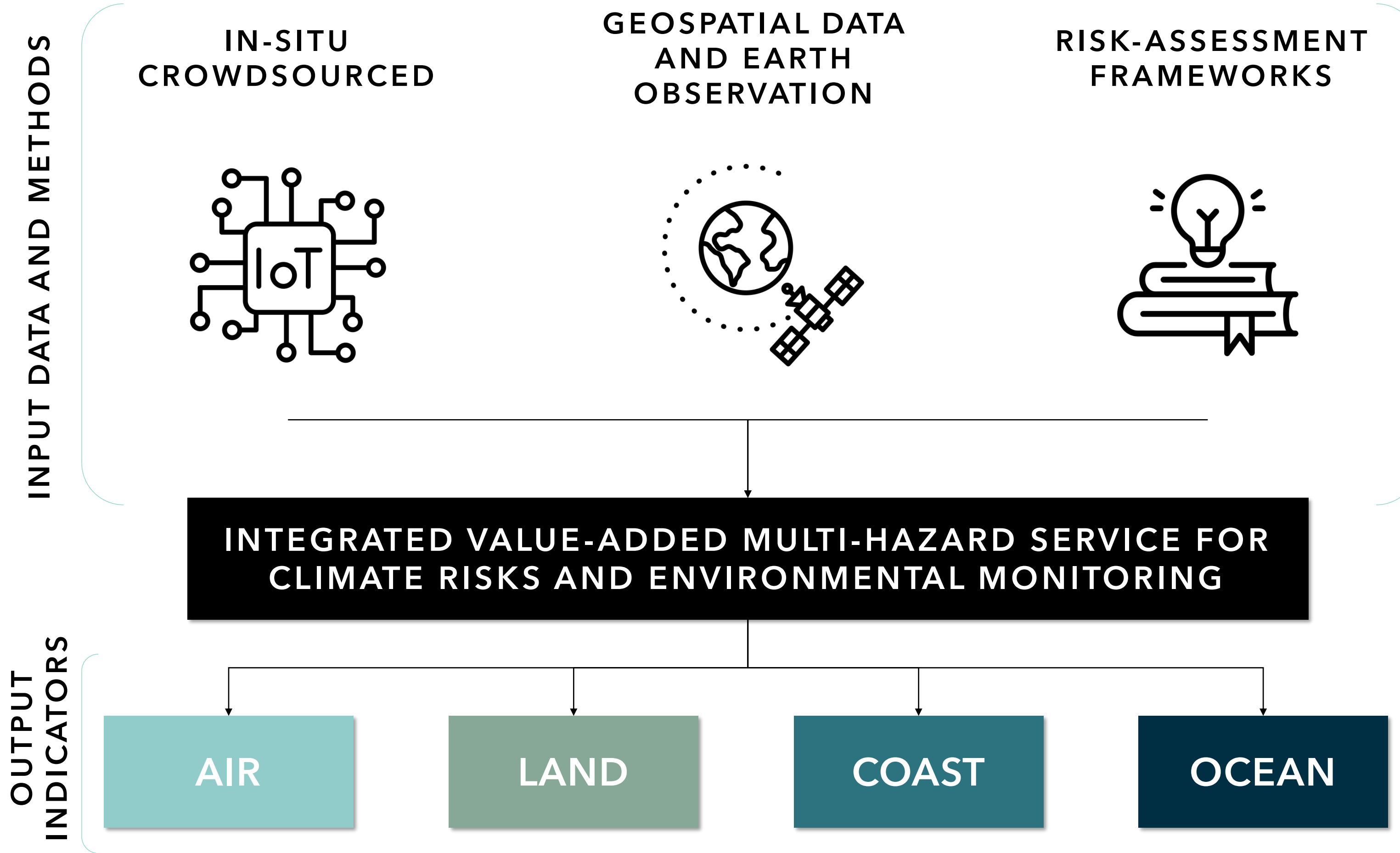
Atlantic SENSE builds upon these notions to leverage the state-of-the-art scientific knowledge on data acquisition, machine learning (ML) and metocean predictions to address the key environmental and climatic challenges we face, to become a live platform with real-time natural hazards and risks information, readily available to the community.

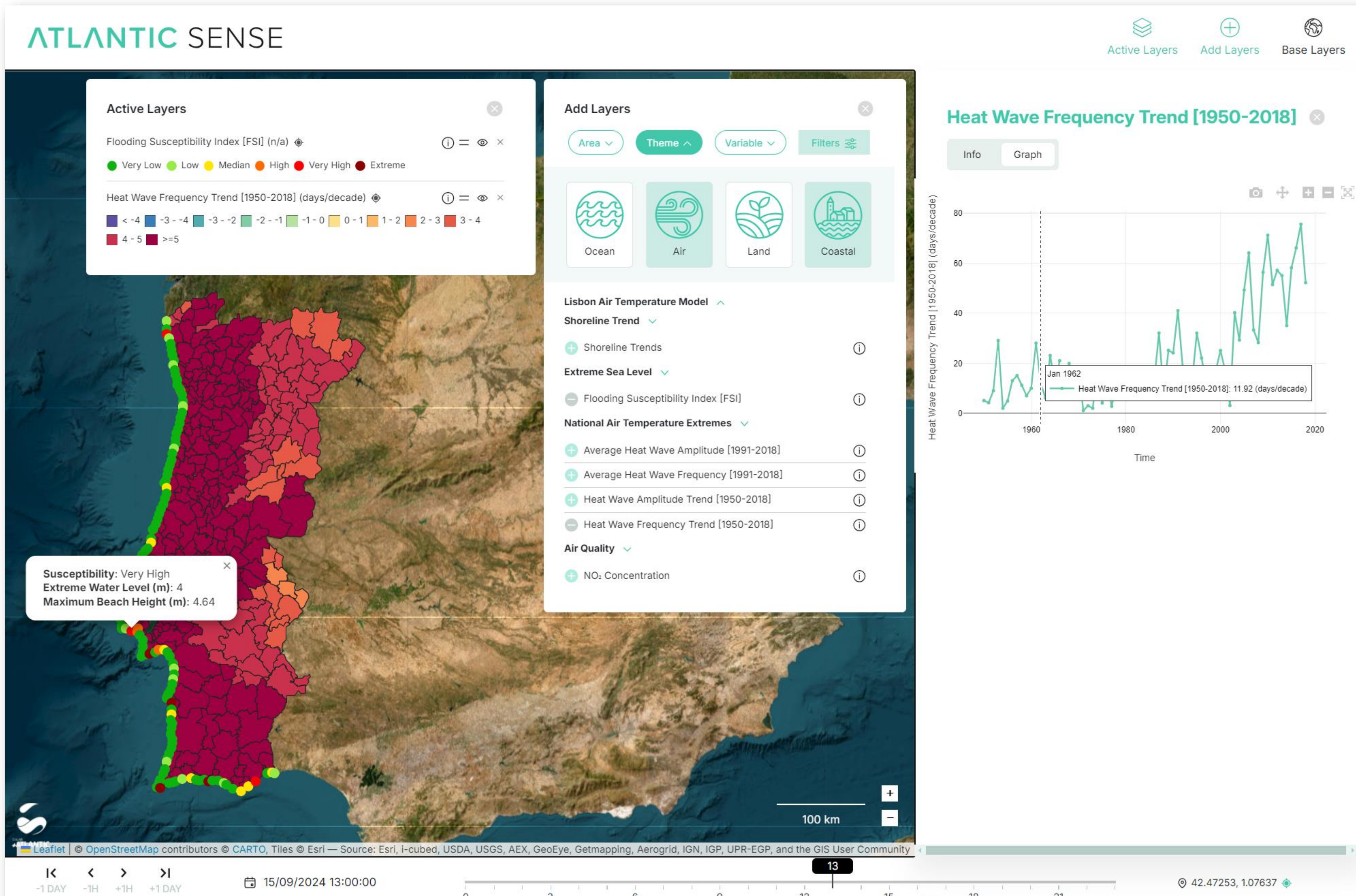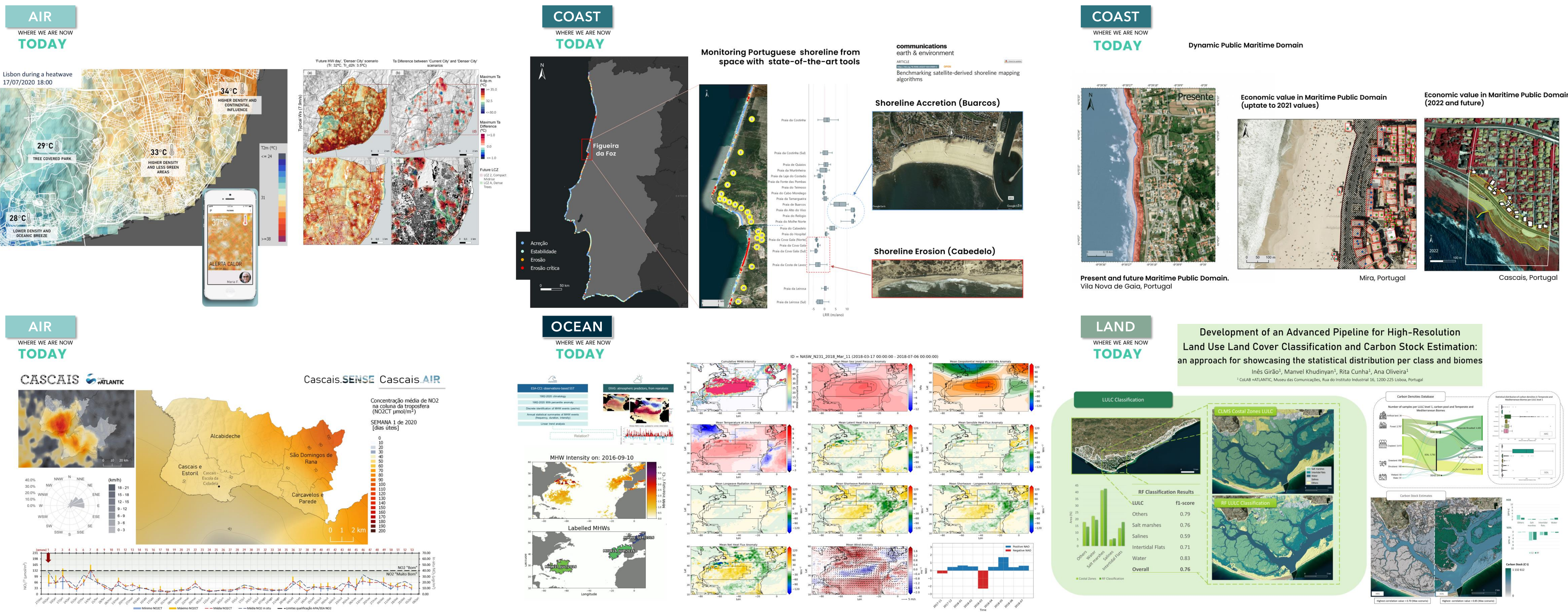The main objectives of the work are:

OBJ-1: Offer an integrated geospatial information web-based tool for municipalities and citizens.

OBJ-2: Translate geospatial and in-situ data into impact indicators on multiple climate and environmental hazards.

OBJ-3: Ensure scalability, transparency and affordability of the results.

INPUT DATA AND METHODS

IN-SITU CROWDSOURCED

GEOSPATIAL DATA AND EARTH OBSERVATION

RISK-ASSESSMENT FRAMEWORKS

INTEGRATED VALUE-ADDED MULTI-HAZARD SERVICE FOR CLIMATE RISKS AND ENVIRONMENTAL MONITORING

OUTPUT INDICATORS

AIR | **LAND** | **COAST** | **OCEAN**

DATA AND METHODS

RESULTS

Building upon the results of several projects and initiatives, such as Horizon Europe (EC), Destination Earth (ECMWF and ESA) and EU Digital Twin Ocean (Mercator Ocean International), the proof-of-concept of the **Atlantic SENSE** concept has been deployed over mainland Portugal. Furthermore, in the scope of the PRR New Space Portugal Agenda, a participatory approach with early adopters has kick-started to ensure fitness for purpose. Currently, several modules are already operational, and being tested:

- **AIR:** temperature extremes health indicators, urban heat island forecast and scenarios, air quality monitoring
- **LAND:** land use/land cover change monitoring, ecosystem services
- **COAST:** coastal erosion monitoring, coastline evolution, sea level rise scenarios
- **OCEAN:** physics and biogeochemical forecasts of ocean health indicators such as marine heatwaves.

Heat Wave Frequency Trend [1950-2018]

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