Software Ecosystem for the Acquisition, Analysis, Processing and Publishing of Marine Observation Data

Artur Rocha (artur.rocha@inesctec.pt)
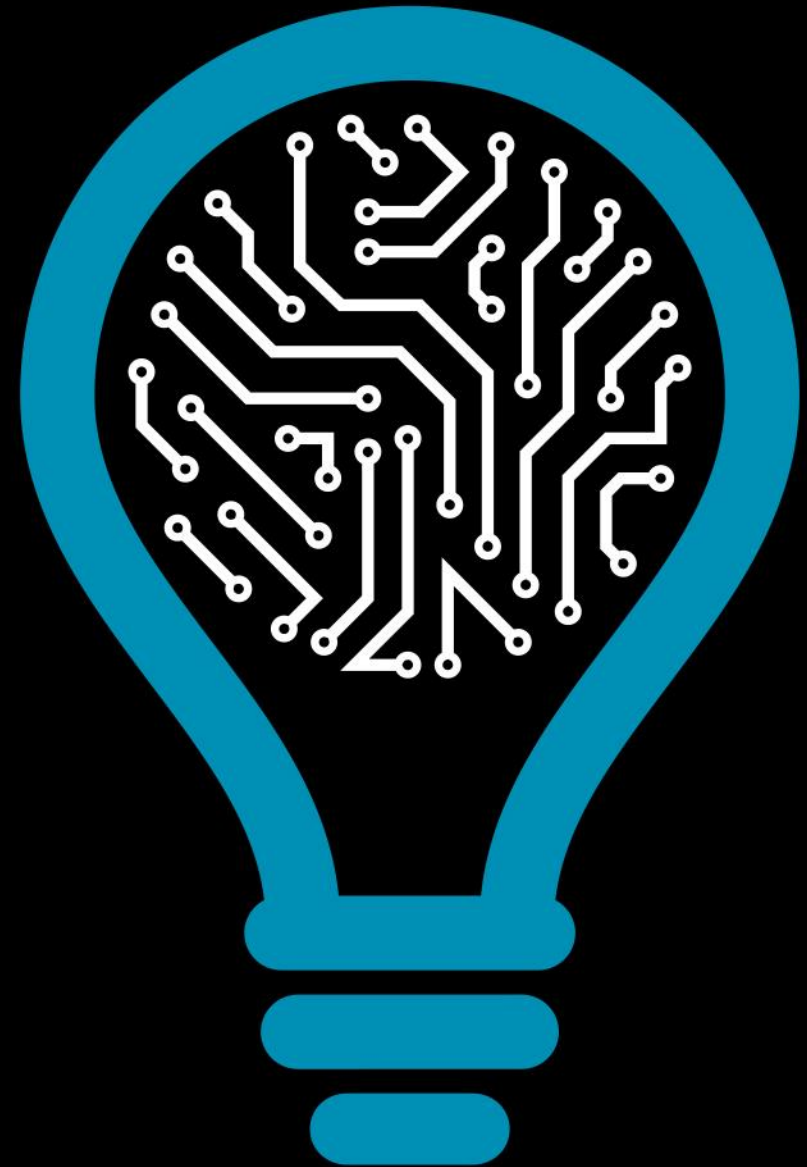
INESC TEC

MARINETECH 2019

November 5th, 2019

INESCTEC

INSTITUTE FOR SYSTEMS
AND COMPUTER ENGINEERING,
TECHNOLOGY AND SCIENCE

- **Life Cycle Overview and Projects**
- **MELOA, the WAVY & the WOS**
- **Data Acquisition**
- **Meta-model for Observation Data**
- **Real-time Data Visualization**
- **Curation Tools & Exploratory Analysis**
- **Publishing Data: End of Upstream Cycle**
- **MarRISK & Coastal Resilience**
- **Observation Data: Managing& Searching**
- **Data Curation: Quality & Availability**
- **Processing: Extraction of Indicators**
- **Communicating Risks**

Data Science Life Cycle Overview
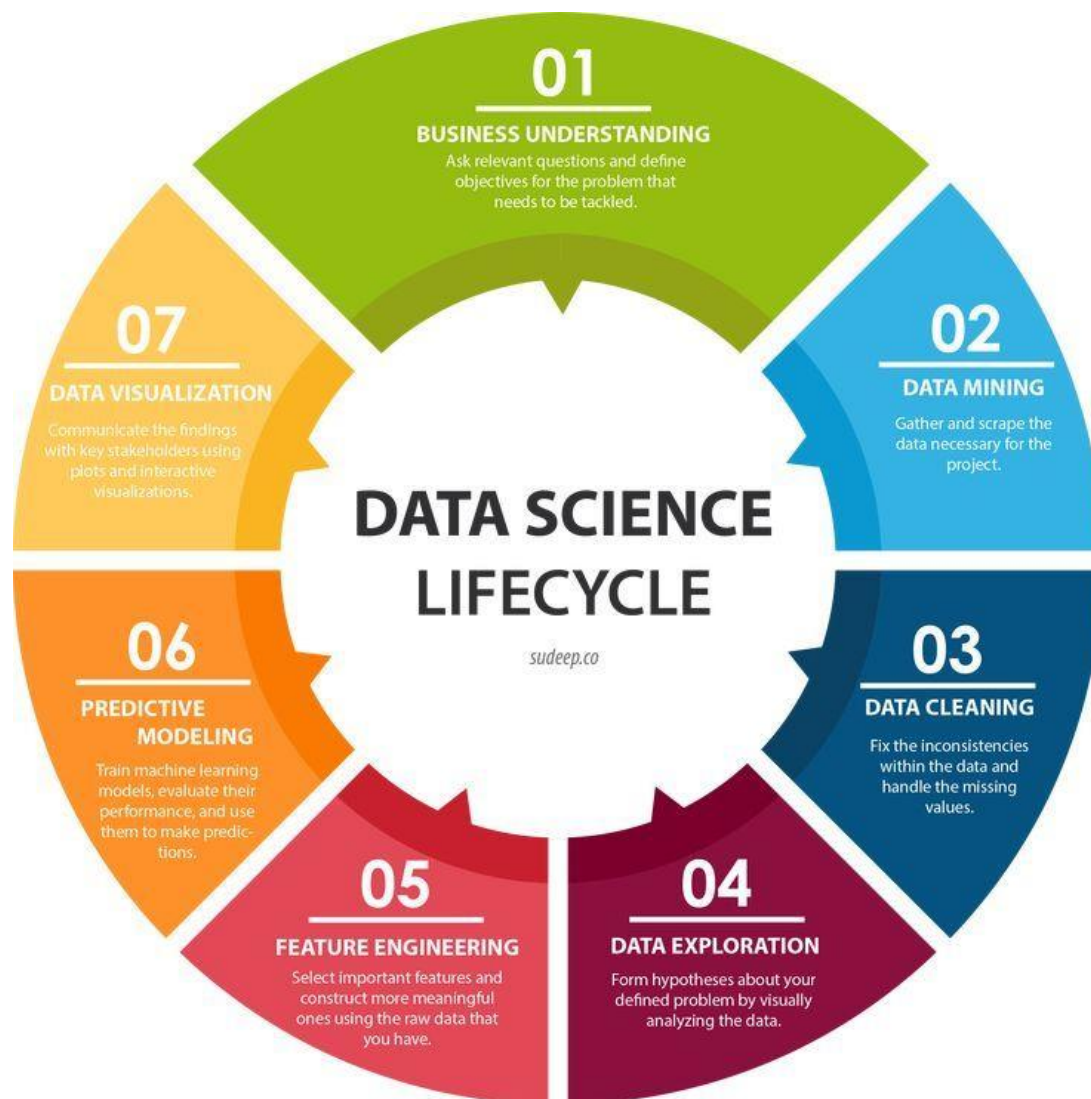
WAVY Drifters & WAVY Operation Software

Multi-purpose/Multi-sensor **E**xtra **L**ight **O**ceanography **A**pparatus

- WAVY is a surface drifter, developed under the scope of MELOA Project, that acquires marine in-situ measurements.

- WAVY Operation Software is a tool, developed by INESC TEC, supporting users in the process of data acquisition, curation (annotation, cleansing, …), exploration and sharing.

Data Acquisition

- The Real Time Data Streamer is a message broker that allows the WOS to subscribe and consume real-time messages sent by the WAVY drifters with virtually no data loss.

- Even in an unlikely event of server unavailability or maintenance, the Real Time Data Streamer will store the measurements until they are successfully transmitted to the WOS.
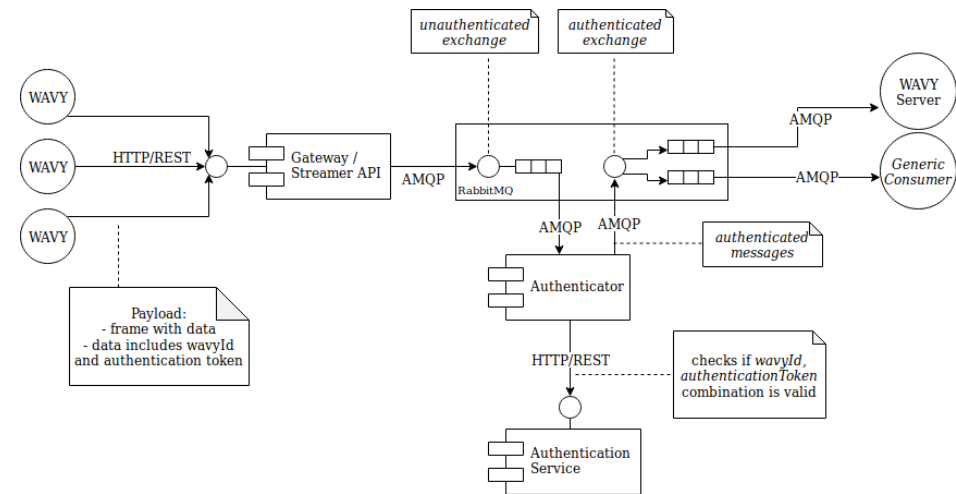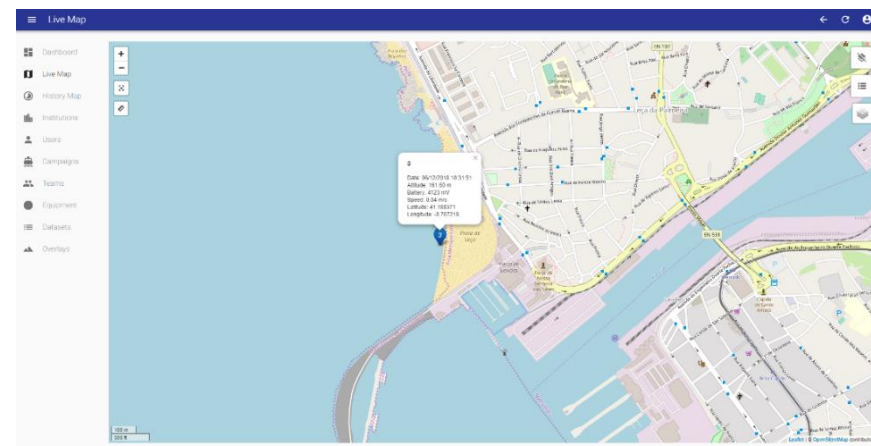
Meta-model for Observation Data

- The WOS leverages on the conceptual model of the Observation & Measurements (O&M) standard.

- The WOS data model was inspired on the OGC SensorThings API data model, with some additions to fulfill the requirements of the MELOA Project.
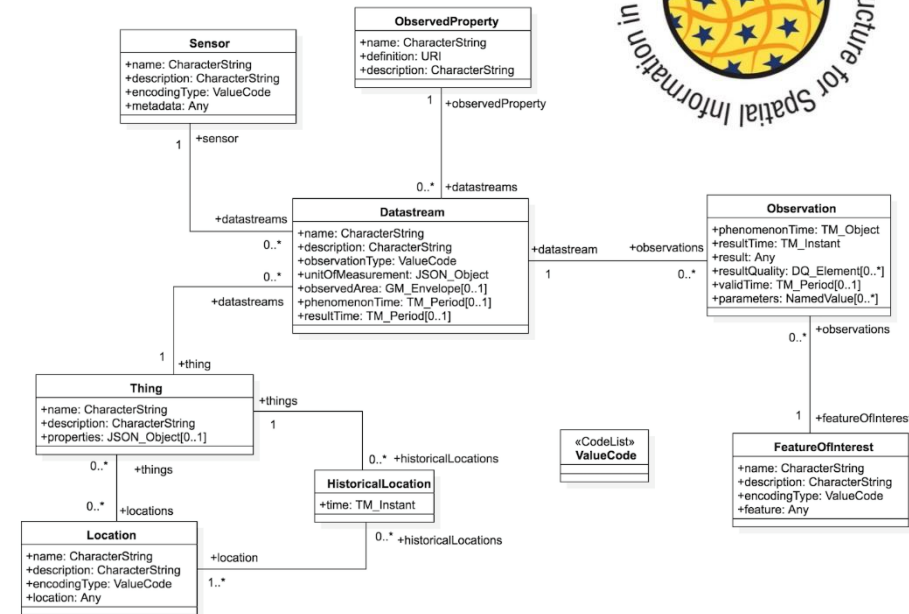
Real-time Data Visualization

- WOS offers a tool that allow users to see the acquired measurements in real-time in a georeferenced map.

- The real-time operation can also be visualized as a table

- Allows the users to take time referenced notes, in a collaborative way.

Curation Tools & Exploratory Analysis

- Annotate datasets cooperatively to facilitate data cleansing/curation

- Assist users in creating derived (cleansed) datasets.

- Implement exploratory visualization tools to help the campaign manager to steer operations during the campaign (e.g. identify what and where to focus deployments)
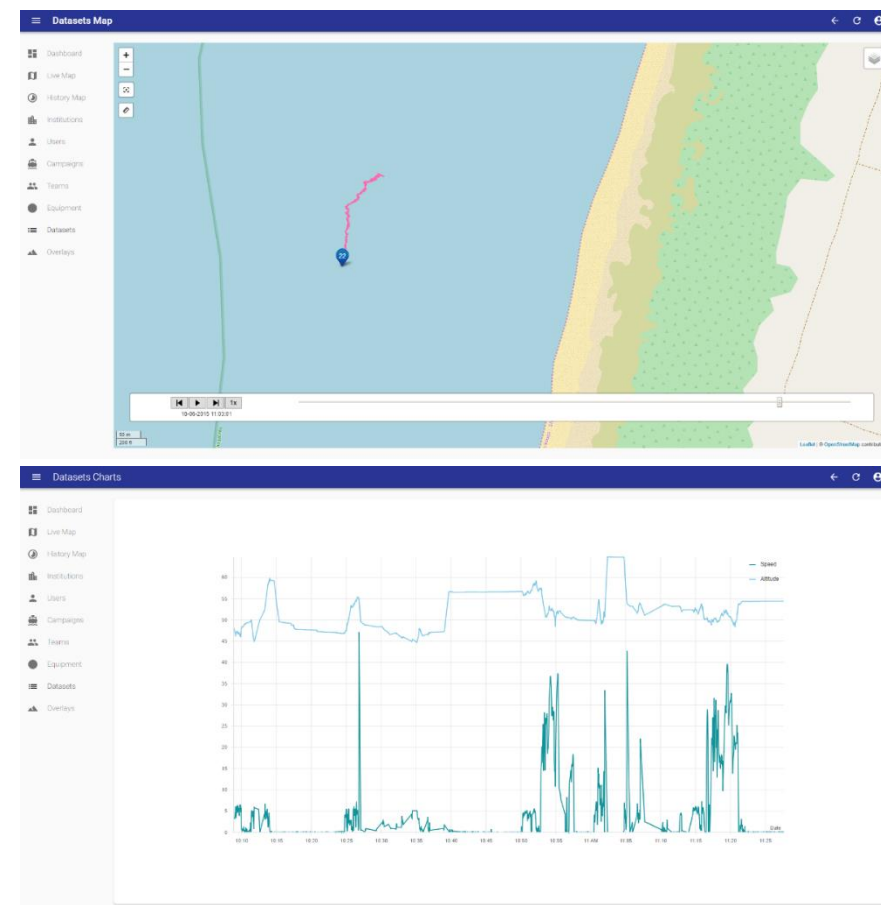
Publishing Data: End of Upstream Cycle

- The WOS has the capability of publishing observation data to a CKAN that feeds a GeoPortal, developed by Deimos.

- Is also capable of publishing data to external O&M/IoT compliant systems such as the Sensor Observation Service, SensorThings API, or even different catalogues such as FIWARE.
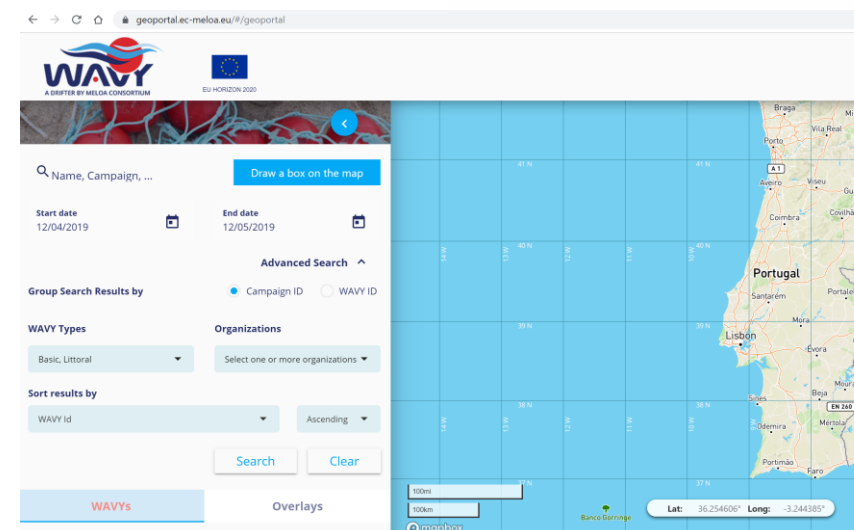
MarRISK & Coastal Resilience

"Costal adaptation to climate change: knowing the risks and increasing resilience."
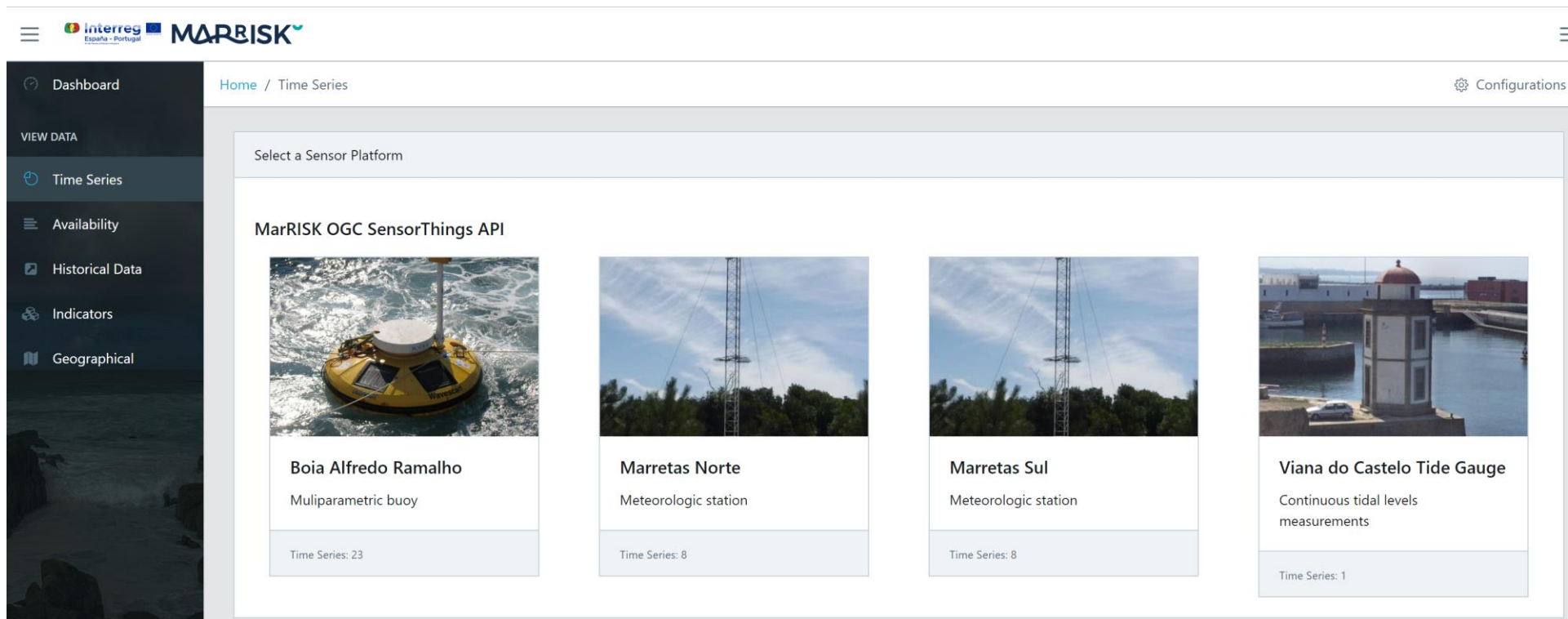
- Combination of Upstream and Downstream Services

- Uses the same Meta-model to store Marine Observation Data

- Data Curation: Overview of Data Quality

- Processing: Extraction of Indicators

- Processed Data Visualization & Outreach: Risks & Resilience

On-going: RADAR ON RAIA (HF RADAR)

Managing Observation Data

http://marrisk.inesctec.pt

Searching Observation Data

Data Curation: Quality & Availability
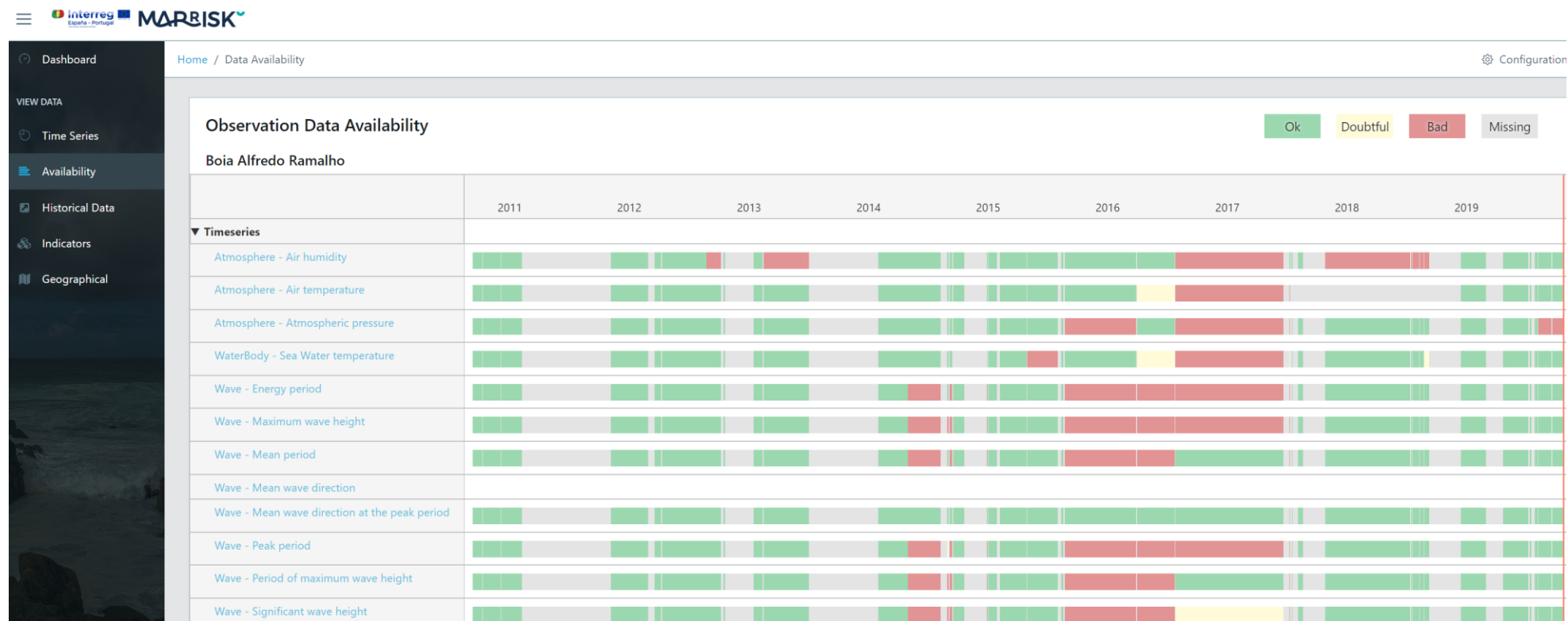
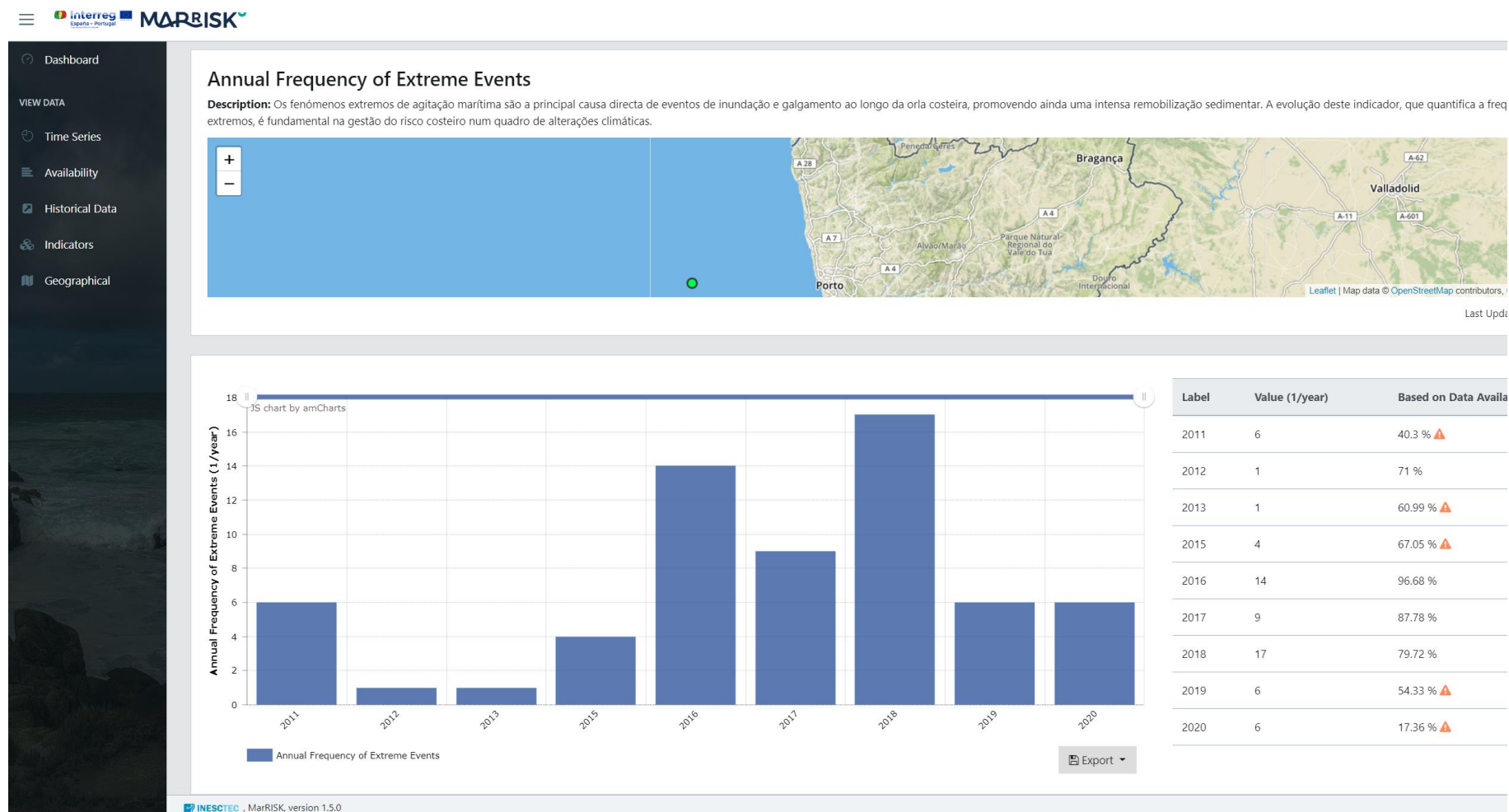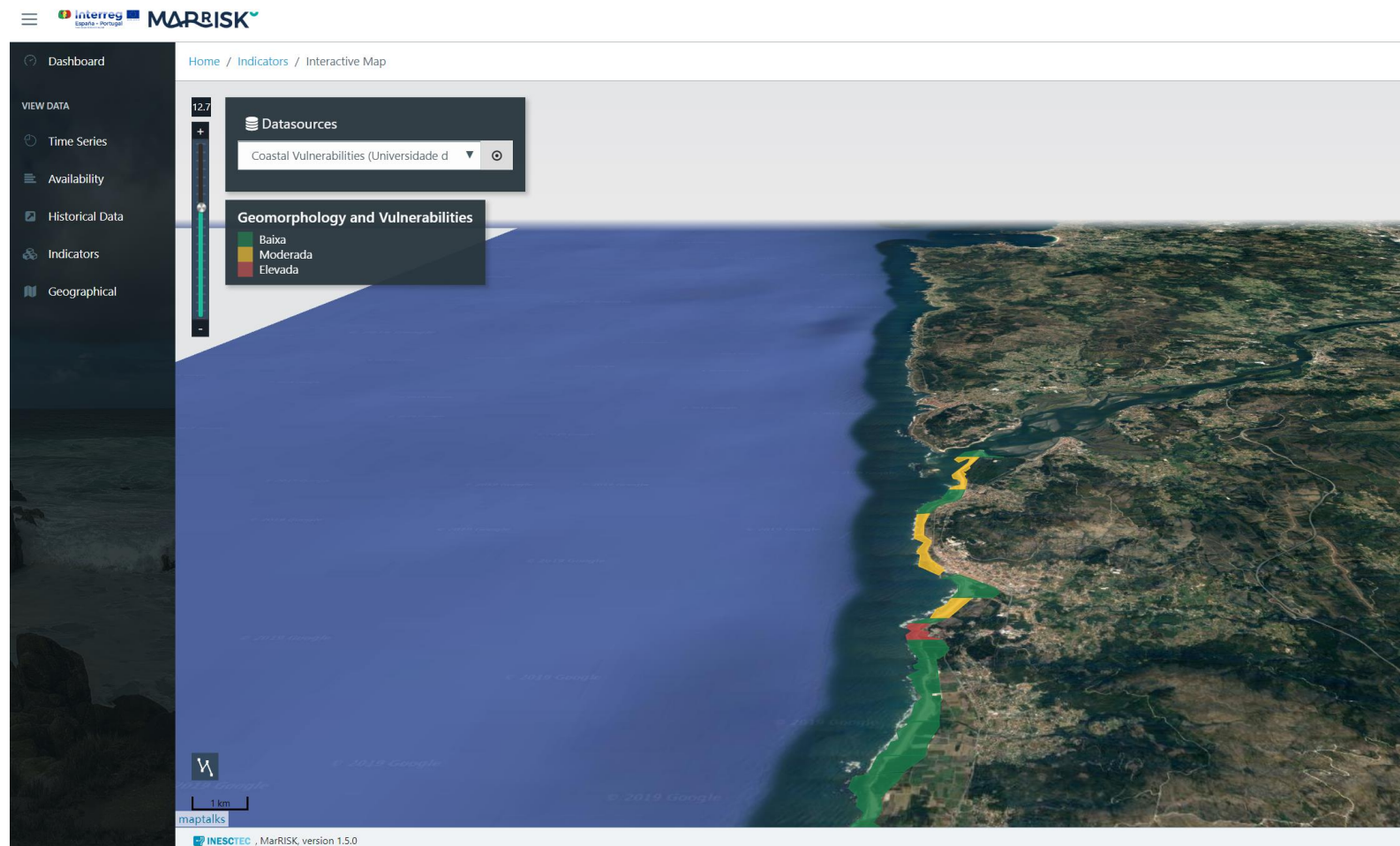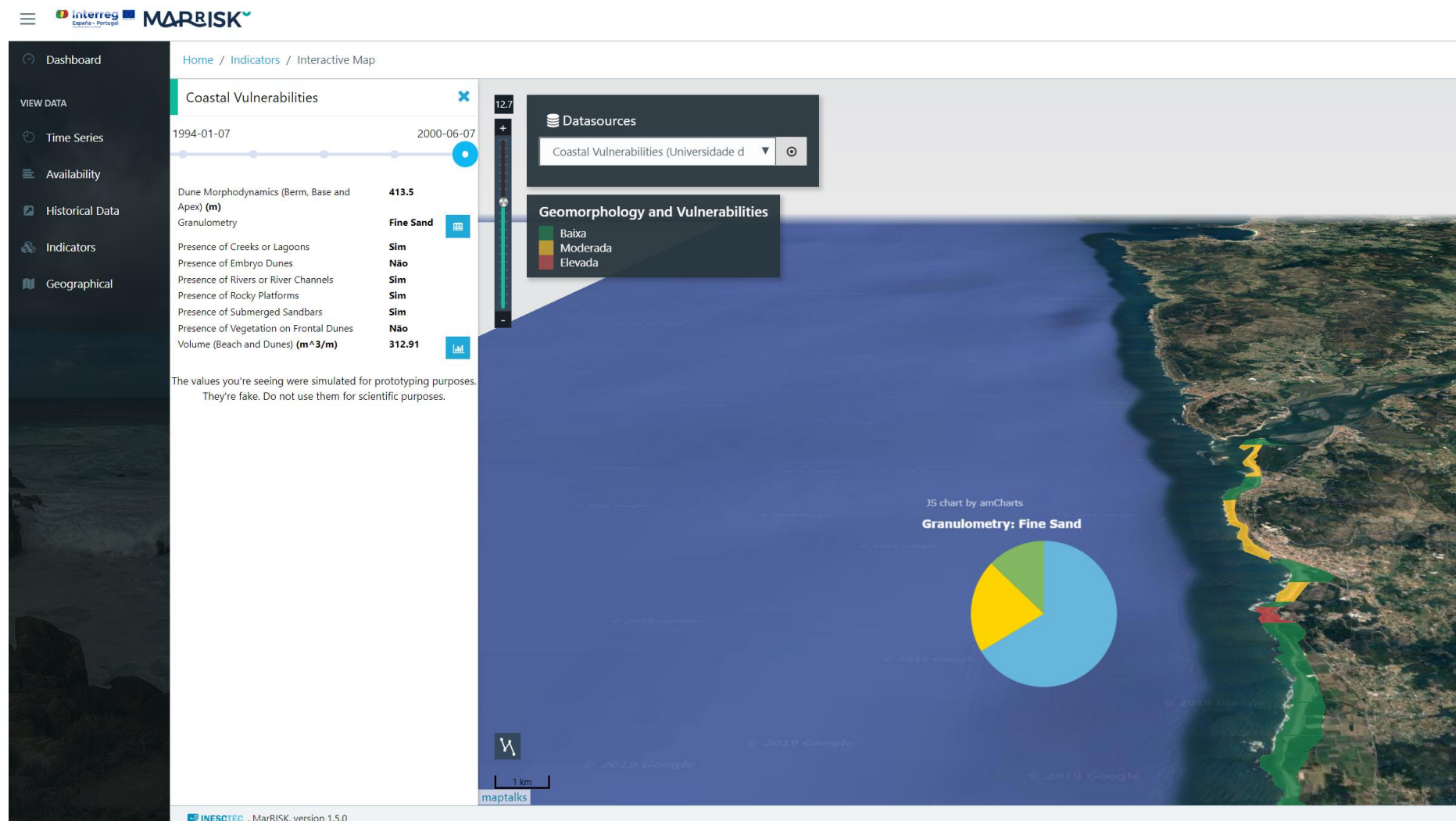# Collection of Indicators
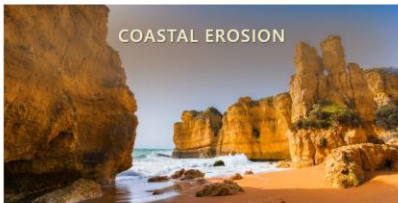
Processing: Automatic Extraction of Indicators

Communicating Risks I

Communicating Risks II

Questions?

Artur Rocha: artur.rocha@inesctec.pt
INESC TEC
Porto, Portugal