



FRIEND: Flood risk & impact assessment through automatic change detection of S-1+S-2 images

Marco Folegani - MEEO





Project:

Flood Risk & Impact assessment through automatic change Detection of S-1+S-2 images

Domain:

Disaster Management

Scope:



**Impact analysis
Risk estimation**



Consortium:



Italian Company operating since 2004 in the field of Earth Observation Applications

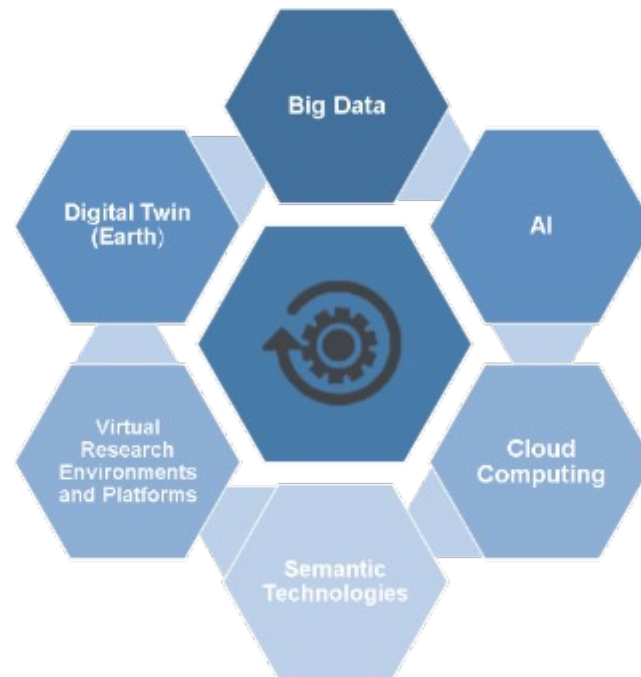
**European Union Satellite Centre.
Analysis for decision making**



“It is key to have the right information, at the right time, to the right people and in the right place”



DATA



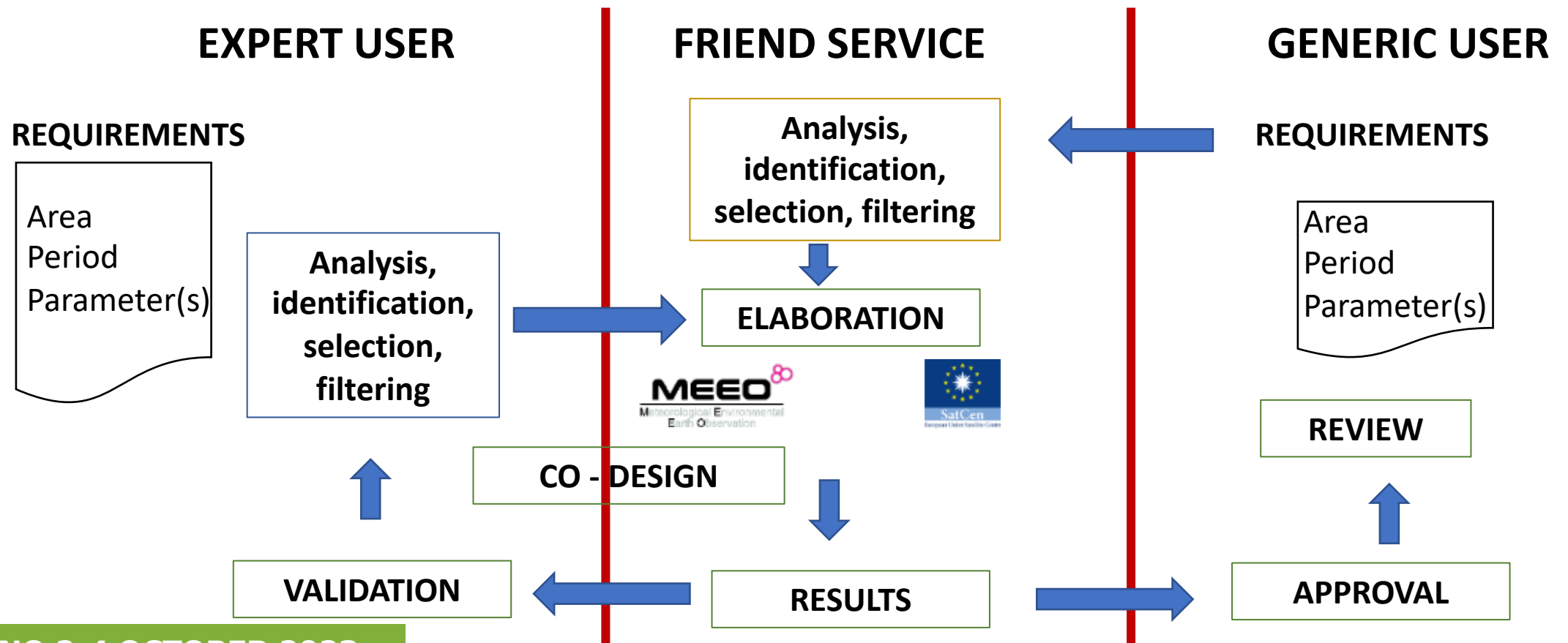
TECHNOLOGY



SCENARIOS



Logic of the service





FRIEND
access the service (non-expert users)

friend MEEO Video Tutorial User Guide

Welcome to FRIEND Platform

e-shape

This pilot aims at assessing the flood risk in selected areas, its impact on urban areas and the associated risk for population. It uses Sentinel-1 and Sentinel-2 change detection data and relevant processing chains to generate time-series of imagery and automatically detect changes on flood events dates, in the following areas: 1) Char-Piya region, an island used also as validation area (Bangladesh), 2) the eastern part of Australia between Queensland and New South Wales, an area relevant for Climate security issues and for its correlation with flood events caused by both hydro-meteorological factors and sea level anomalies (as for case 1), 3) the west Dairur, as additional example of inland area.

The main output will be exposed through the FRIEND platform public GUI based on MEEO data cube technology, to provide citizens and non-expert users with a Flood Risk & Impact Assessment dashboard based on maps and time-series charts.

The FRIEND platform also addresses expert users through the Jupyter Notebook web-based interactive development environment, thus allowing to configure and run customized pipelines and workflow.

friend FRIEND Platform (Public)
friend FRIEND Jupyter Notebook (Expert)

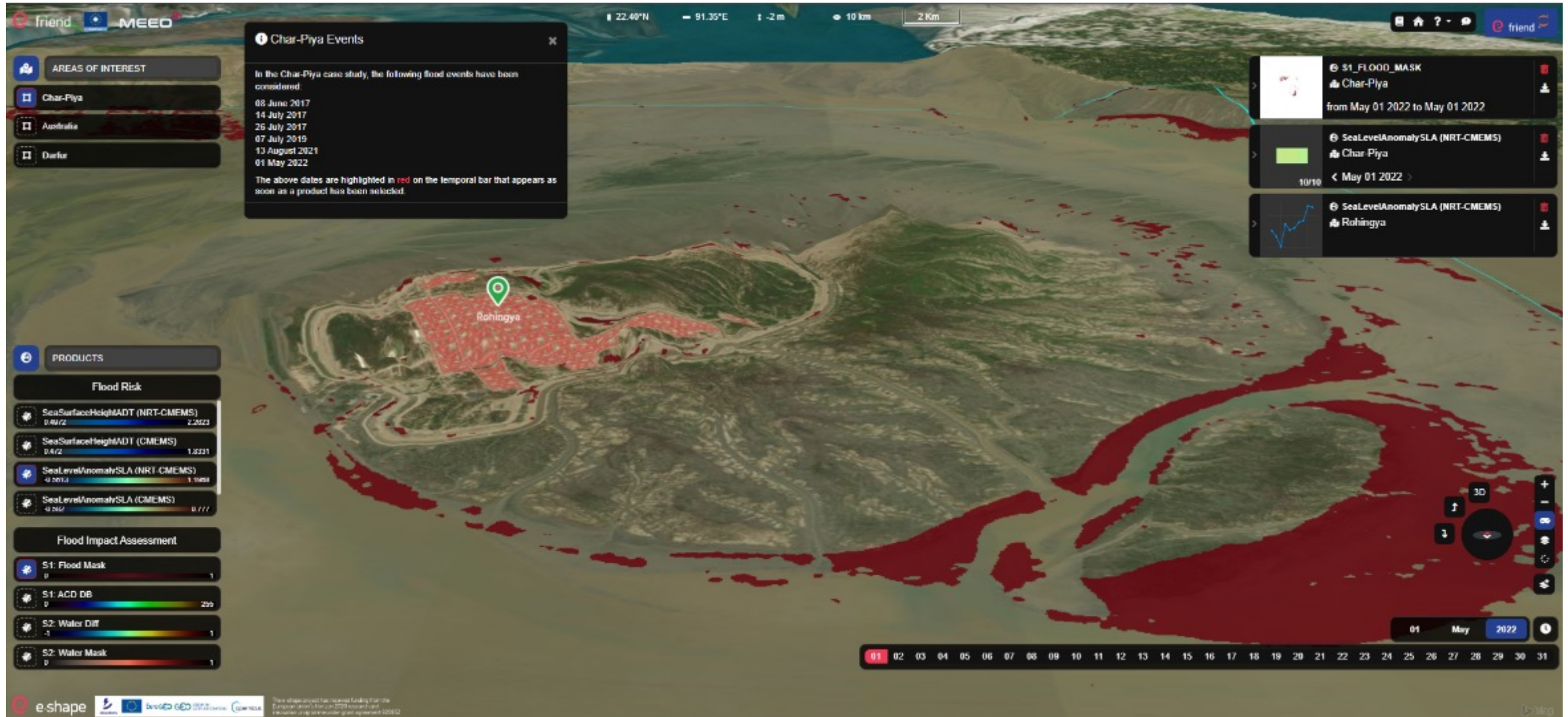
Most of the data are ingested and provided in near-real-time, thus covering the last recent days.

The Flood Impact Assessment products, based on Sentinel-1 and Sentinel-2, are produced in the frame of SatCen RTDI activities, in particular they are processed by the GEO-DAMP pipelines.

The inland GloFAS products are provided by the Copernicus Emergency Management Service – Global Flood Awareness System (GloFAS). [GloFAS Terms & conditions](#)



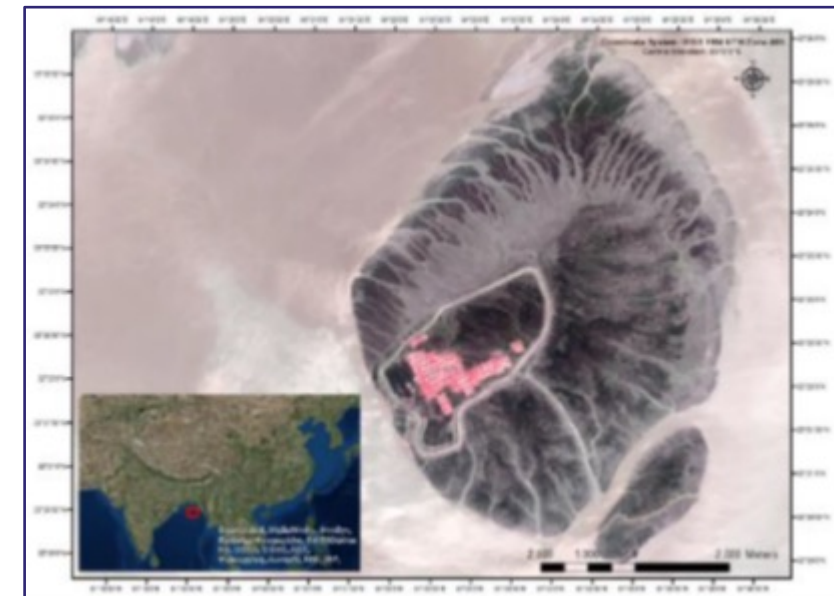
FRIEND - Climate data and Flood impact





Jupyter Notebook application (expert users)

- Jupyter Notebook component for expert users (e.g. SatCen)



- Sentinel-1 + Sentinel-2 **data fusion** (GEO-DAMP component)
- Flexible and highly customizable **web-based interactive development environment**



Lessons learnt and further evolution

Lessons learnt:

- FRIEND allows us to add value to existing products by **aggregating other products** that facilitates a fully understanding of the context and the correlation with other variables;
- FRIEND is a **single access point** to multiple data;
- FRIEND will **increase user community**, moving from institutional users to international cooperation;
- FRIEND will **facilitate the user uptake** and enable the **exploitation of data by non-expert** users;

Further evolutions:

- **Further case study** implementation and new flood risk monitoring products integration
- Continuation of **dissemination** activities;
- **Integration with existing enduser services** .



Thank you!

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- FRIEND pilot on the e-shape website:
<https://e-shape.eu/index.php/showcases/pilot-6-5-friend>
- FRIEND landing page:
<https://friend.adamplatform.eu/>
- FRIEND user guide:
https://friend.adamplatform.eu/static/friend/userguide/S6P5_UserGuide_FRIEND_v3.pdf
- FRIEND video tutorial (on the landing page)

Useful links