

ESA support to MCST EO Programme

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<https://eo4society.esa.int/>

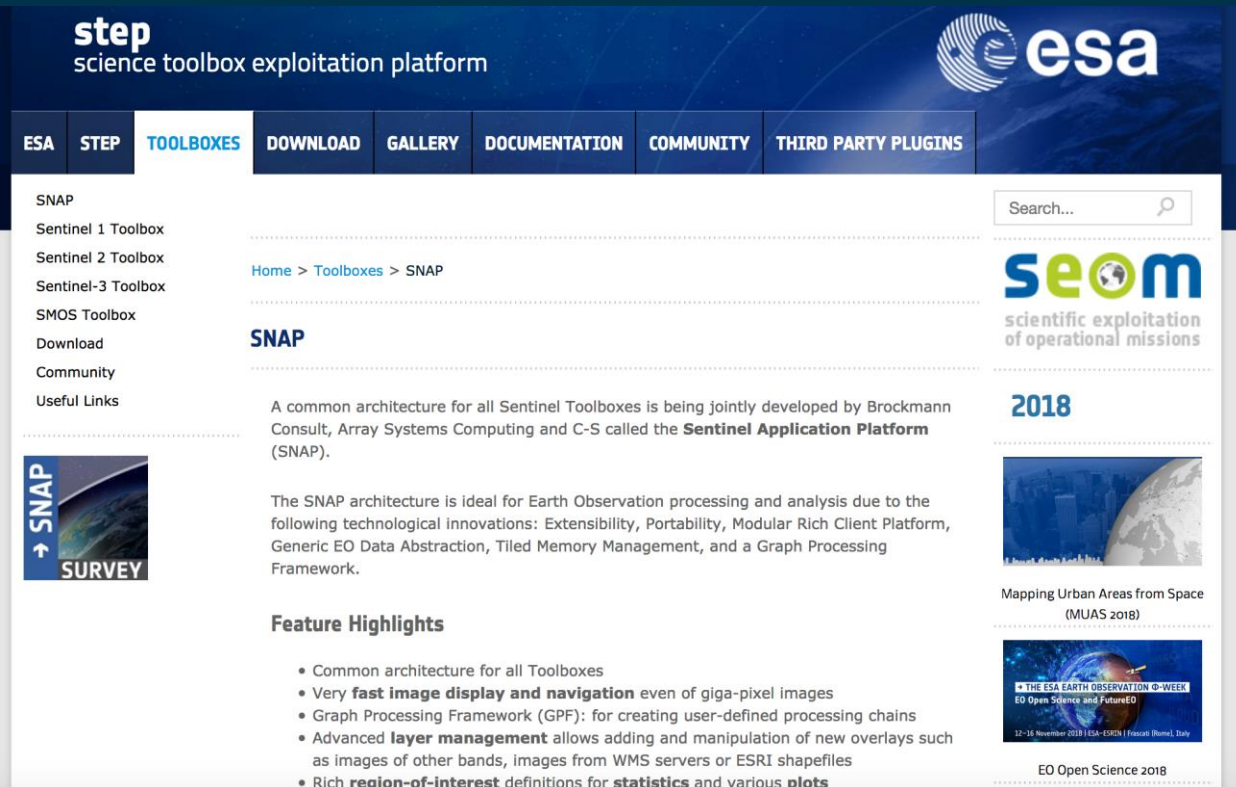
- Resources already available to you (free of charge!!!)
- Hints and tips from reviews of previous proposals
- Questions

Resources/Capabilities Already Available

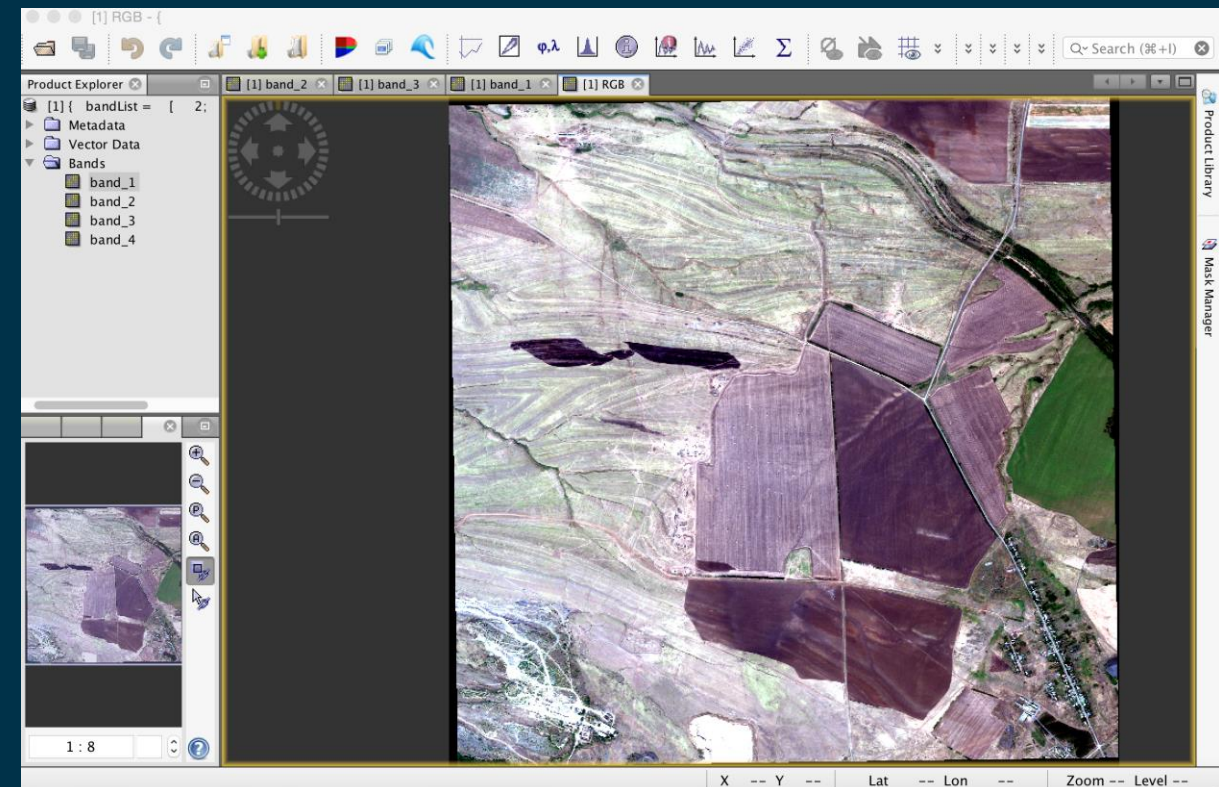
(so don't try to duplicate these unless you have an extremely good justification)

For more information: <https://eo4society.esa.int/>

Processing tools



The screenshot shows the 'step science toolbox exploitation platform' website. The header includes the ESA logo and navigation tabs: ESA, STEP, TOOLBOXES, DOWNLOAD, GALLERY, DOCUMENTATION, COMMUNITY, and THIRD PARTY PLUGINS. The left sidebar lists various toolboxes: SNAP, Sentinel 1 Toolbox, Sentinel 2 Toolbox, Sentinel-3 Toolbox, SMOS Toolbox, Download, Community, and Useful Links. The main content area is titled 'SNAP' and describes it as a common architecture for all Sentinel Toolboxes, jointly developed by Brockmann Consult, Array Systems Computing, and C-S. It highlights technological innovations like Extensibility, Portability, and Modular Rich Client Platform. A 'Feature Highlights' section lists: Common architecture for all Toolboxes, Very fast image display and navigation even of giga-pixel images, Graph Processing Framework (GPF) for creating user-defined processing chains, Advanced layer management for adding and manipulating new overlays, and Rich region-of-interest definitions for statistics and various plots. A 'seom' logo and a '2018' banner are also visible.



The screenshot shows the SNAP software interface. The top toolbar contains various icons for file operations, processing, and visualization. The 'Product Explorer' on the left shows a tree structure with 'bandList' containing 'band_1', 'band_2', 'band_3', and 'band_4'. The main window displays a satellite image of a landscape with a river and fields. The bottom status bar shows coordinates (X, Y, Lat, Lon) and zoom/level information.

<http://step.esa.int/main/toolboxes/snap/>

Analysis tools



sen4cap
common agricultural policy

- Validated algorithms, products, workflows and best practices for agriculture monitoring relevant for the management of the CAP.
- Support the use of Sentinel derived information to support **modernization and simplification of the CAP** post 2020

WOIS



- Open-source System for monitoring, assessing and inventorying water resources in a cost-effective manner through satellite data
- 28 specific water information products covering the whole cycle of IWRM, developed in close collaboration with water authorities and commissions

Exploitation Platforms



→ TEP COASTAL



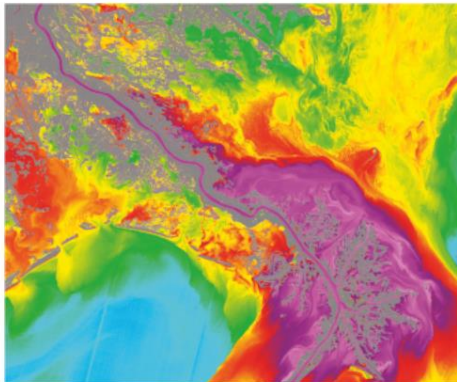
→ TEP FORESTRY



→ TEP GEOHAZARDS



→ TEP FOOD SECURITY



→ TEP HYDROLOGY



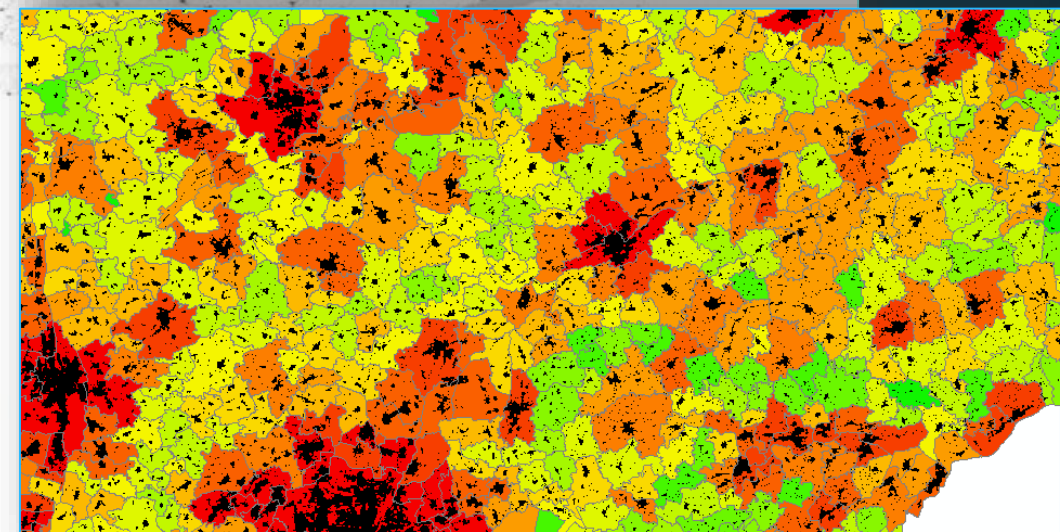
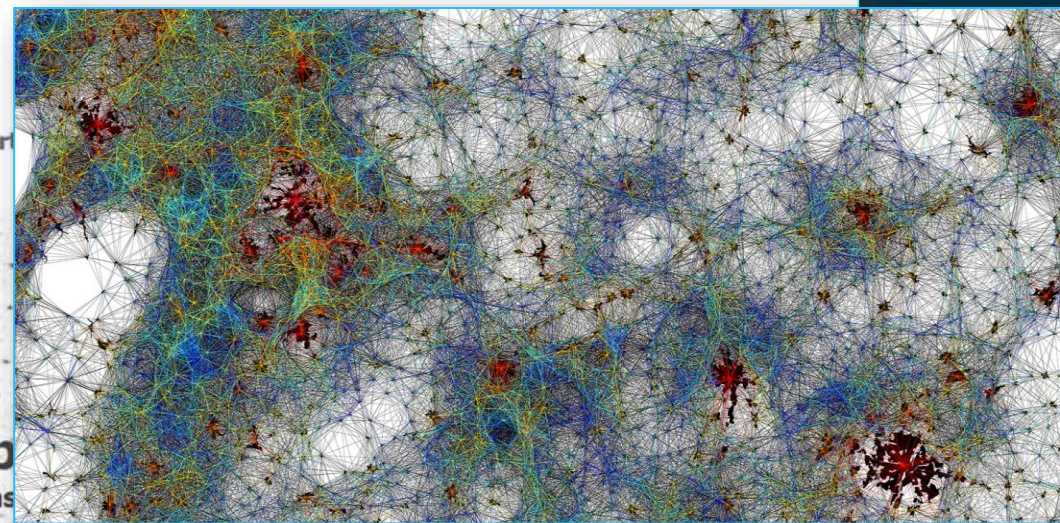
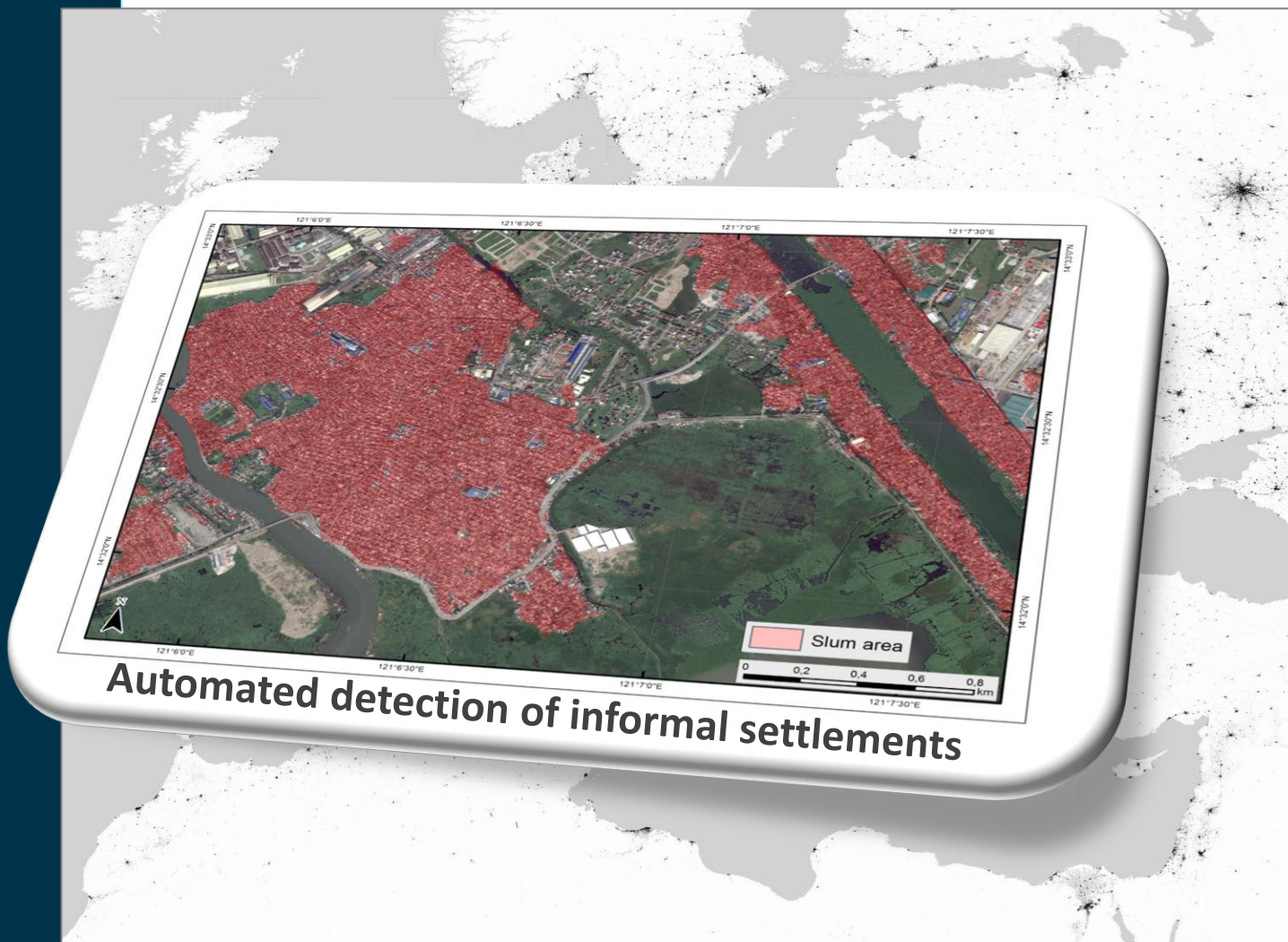
→ TEP POLAR



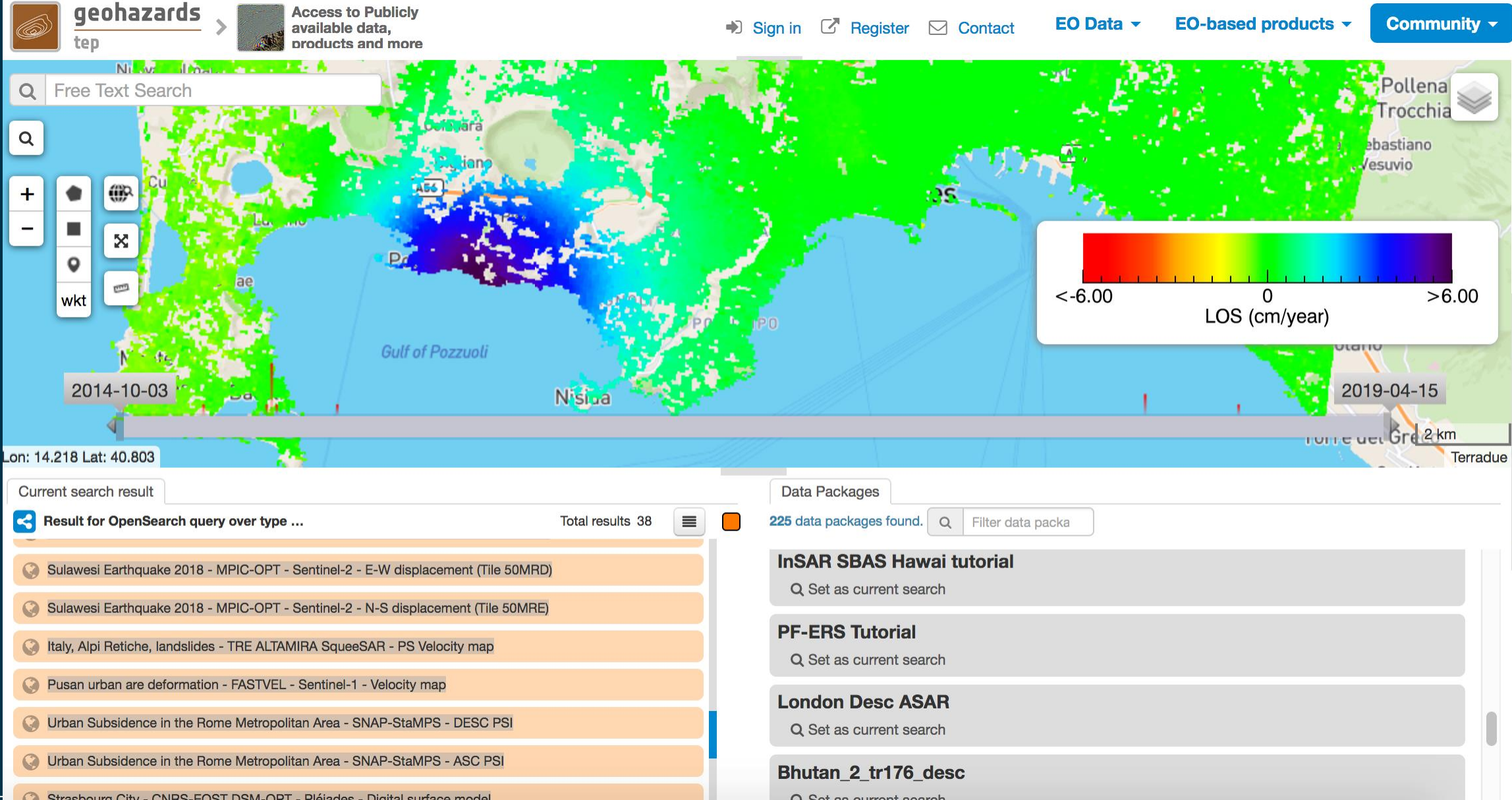
→ TEP URBAN

<https://tep.eo.esa.int/>

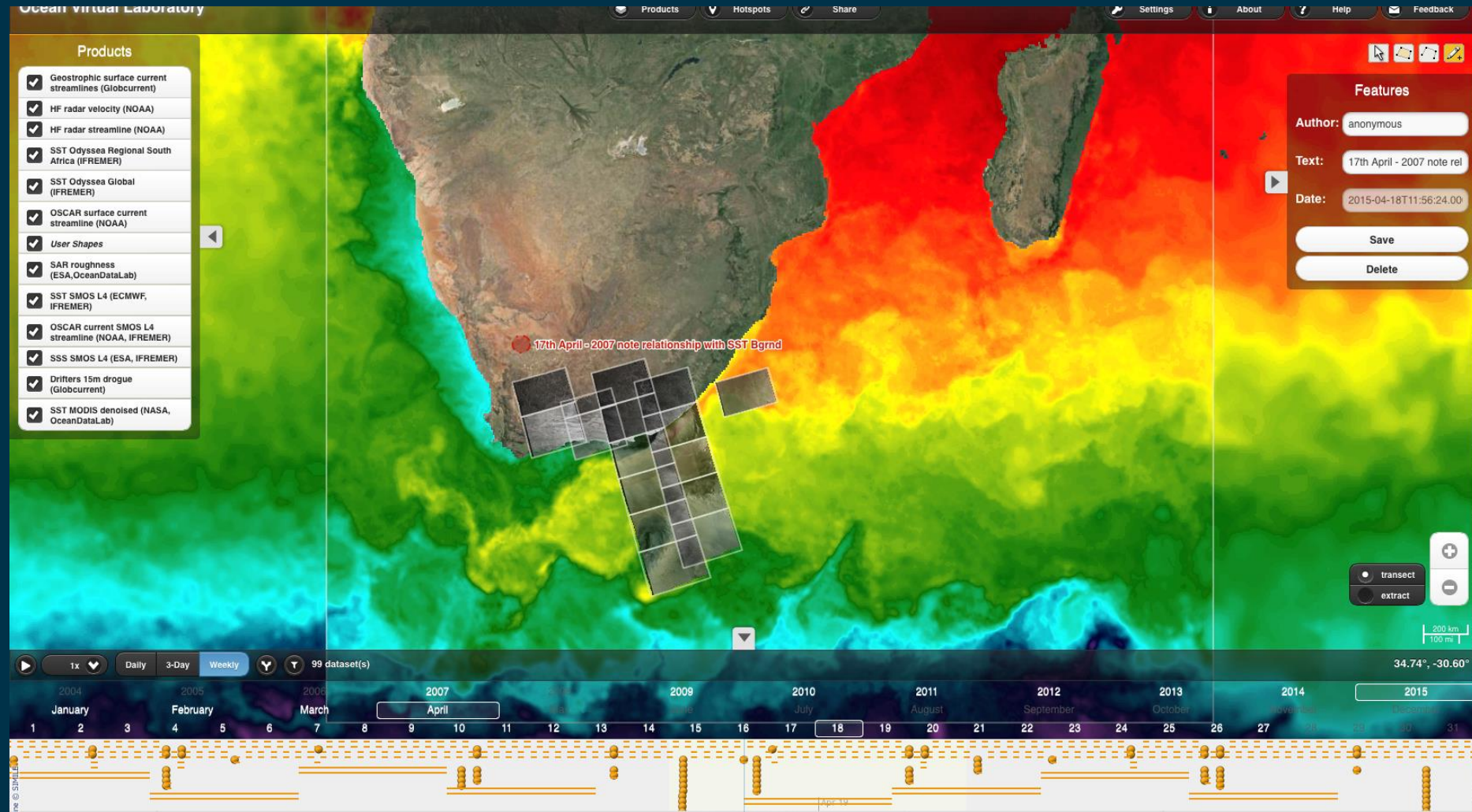
Example 1 – the Urban TEP



Example 2 – the Geohazard TEP



Virtual laboratories (Ocean now, more to come)



Access to EO data



Copernicus

Copernicus Open Access Hub

esa

European Commission

Welcome to the Copernicus Open Access Hub

The Copernicus Open Access Hub (previously known as Sentinels Scientific Data Hub) provides complete, free and open access to Sentinel-1, Sentinel-2 and Sentinel-3 user products, starting from the In-Orbit Commissioning Review (IOCR).

Open Hub

API Hub

S-3 PreOps Hub

GNSS Hub

SENTINEL Hub

THE NEXT GENERATION OF SATELLITE IMAGERY SERVICE

Browse. Pick. Enhance. Expose.

EXPLORE HUB

REQUEST TRIAL

Copernicus Open Access Hub

SIGN UP

LOGIN

Insert search criteria...

Pan

Box

Polygon

Clear

EO Data Finder

Search criteria

search phrase, e.g. winter in Quebec

product identifier or path

observed: YYYY-MM-DD - YYYY-MM-DD

published: YYYY-MM-DD - YYYY-MM-DD

position: latitude - longitude

cloud cover: 0-100 %

collection: collection

search results

title observation date publication date cloud % file size

showing 0 out of 0 total results

copy all as paths

copy all as urls

save all on storage

add all to cart

order processing (last search)

rest query

polygon selection

point selection

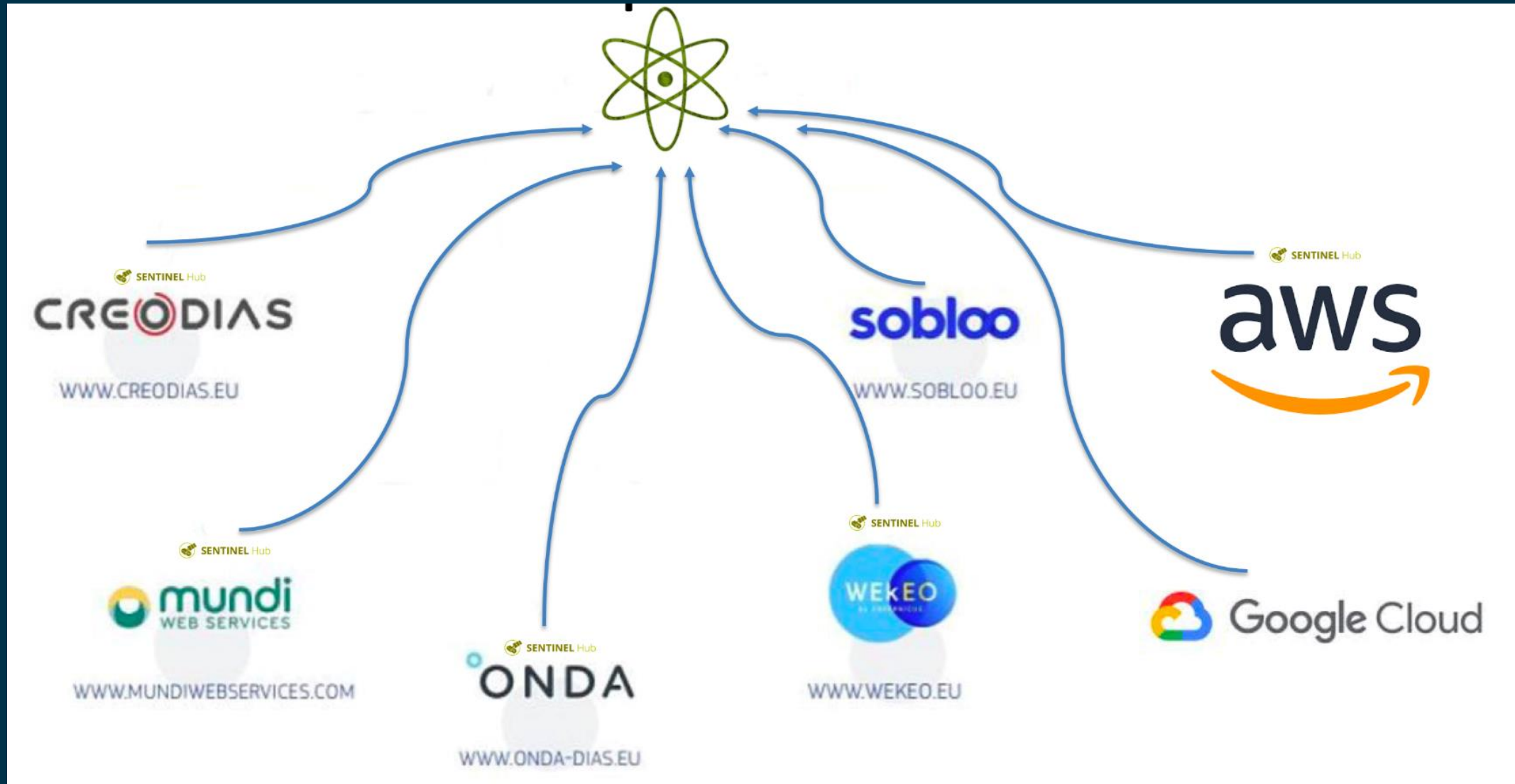
search

clear all



<https://finder.eocloud.eu/>

Resources – Data access and processing



Third Party Missions



ALOS

Aura OMI

CartoSat-1

COSMO-SkyMed

Deimos-1

Deimos-2

DMC-1

GeoEye-1

GOSAT

GOSAT-2



GRACE

ICEYE

IKONOS

IRS-1C

IRS-1D

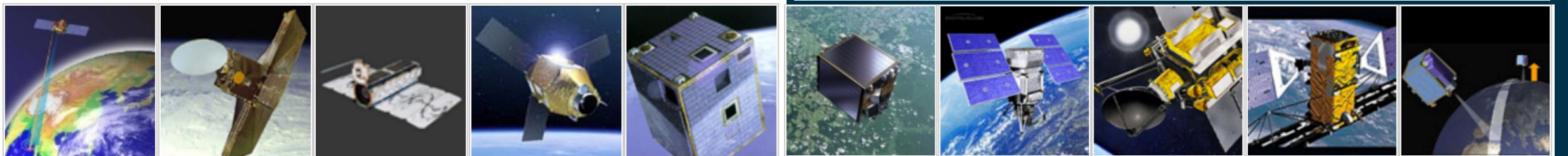
JERS-1

KOMPSAT-1

KOMPSAT-2

Landsat TM/ETM

Landsat OLI/TIRS



OceanSat-2

Odin

PlanetScope

Pleiades-HR

Proba-1

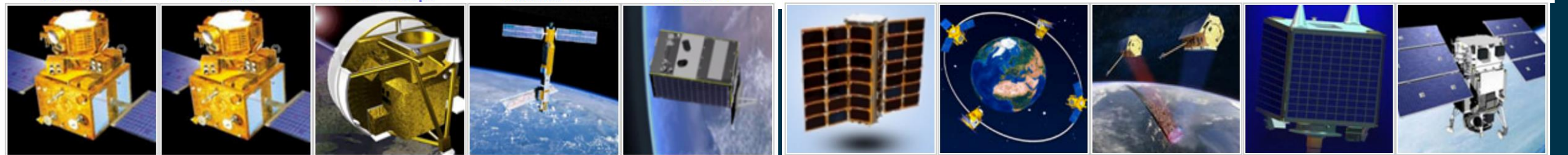
Proba-V

QuickBird

QuikSCAT

RADARSAT-2

RapidEye



ResourceSat-1

ResourceSat-2

SciSat-1/ACE

SeaSat

SkvSat

Spire

SPOT

TerraSAR-X and
TanDEM-X

UK-DMC

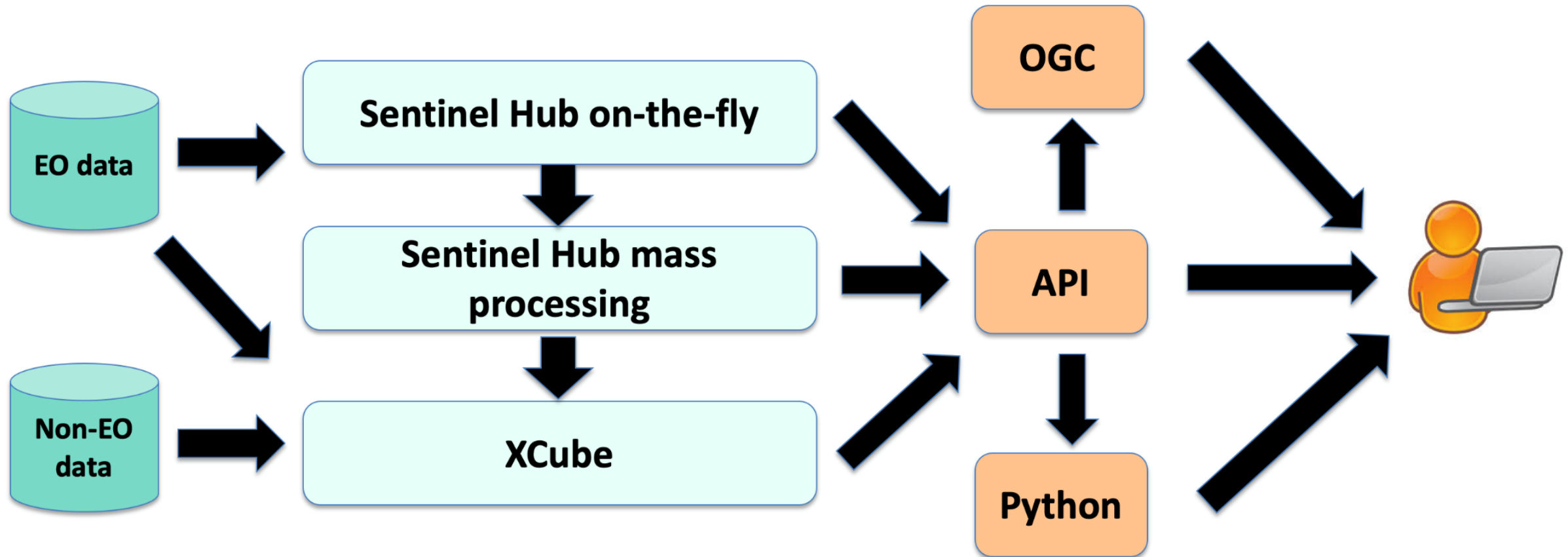
WorldView-1



WorldView-2

WorldView-3

Recently Available– Open Data Cube



Scripting (R, Python, ENVI...)

Training courses - MOOCs





ECHOES IN SPACE

Introduction to Radar Remote Sensing

**Re-Run 2019 | 2nd Edition
Starting September 16th 2019**

Enroll now:
eo-college.org



Monitoring climate from space
2018



Earth Observation from Space: the Optical View
2018

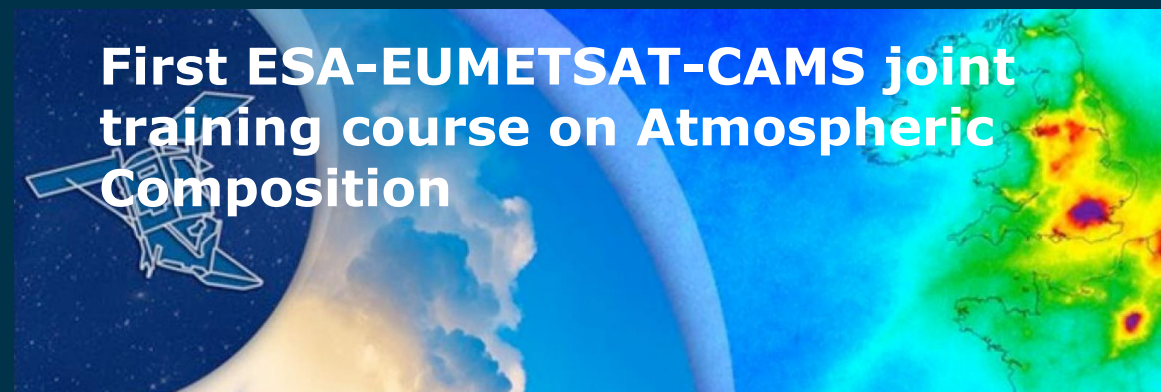
Training courses – hands on



**Advanced course on
radar polarimetry
2019**



**Advanced training
course on Land
remote sensing with
the focus on
Agriculture**



General ESA-EO Training Courses

11th ESA Training Course in Earth Observation

Malta, 22nd to 26th March 2021



ESA-NASA Trans-Atlantic Training Courses



Novi Sad, Serbia, 20-24 June 2019

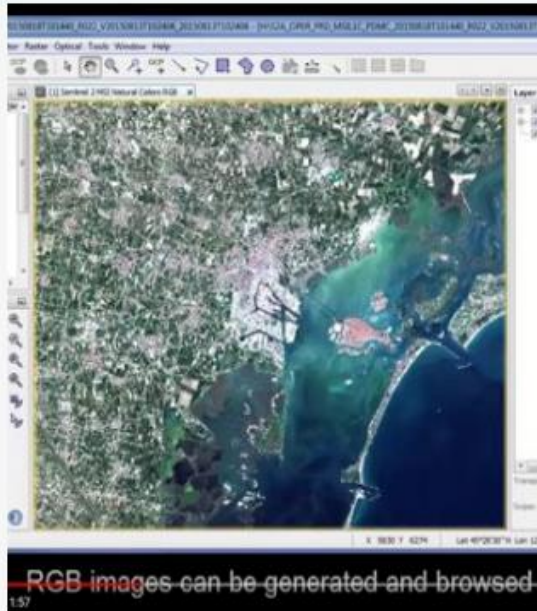
**Trans-Atlantic Training 2019 (TAT-7):
radar and optical remote sensing in
the agricultural and environmental
monitoring**



Additional training opportunities

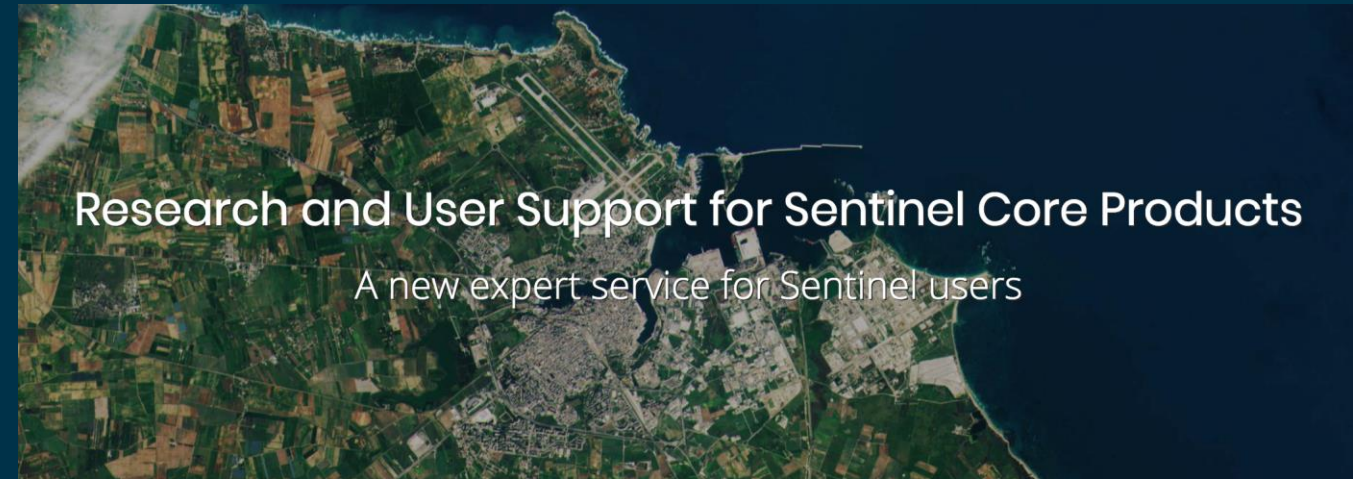
SNAP Toolbox

ESA RUS



STEP and the Sentinel-2 Toolbox

How to process Sentinel-2
data with SNAP tutorial



Use of EO for Geology & Land Subsidence with Sentinel-1: an InSAR demo with Open Tools using RUS service

Face2Face

Tuesday 10th of December 2019 - Wednesday 11th of December
2019

Workshops



POLINSAR 2021
10th International Workshop on Science and Applications of SAR Polarimetry and Polarimetric Interferometry
26 – 30 APRIL 2021 VIRTUAL ONLINE EVENT
[REGISTER TO THE EVENT](#)

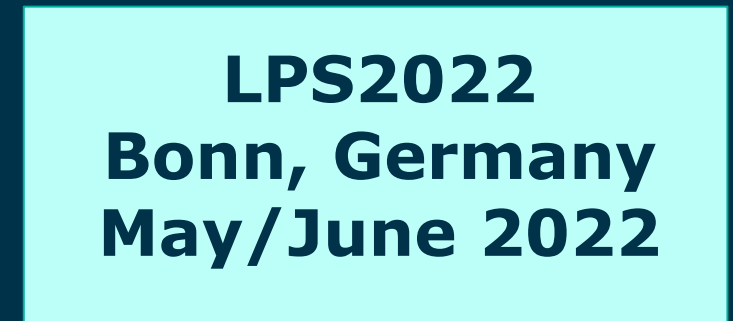
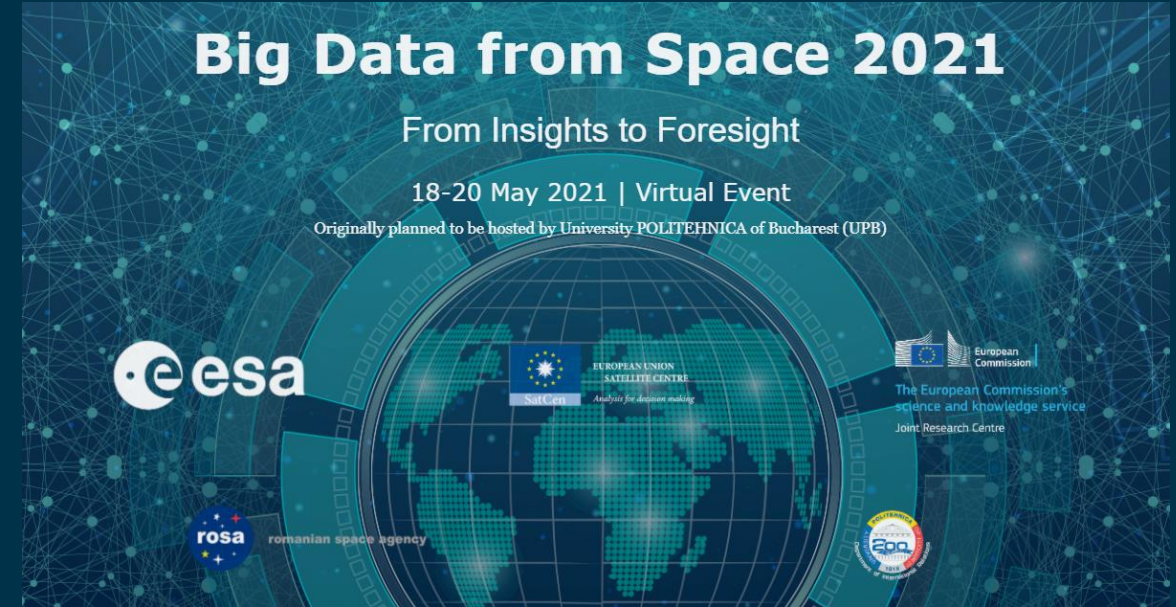
balkans from space
18-19 April 2018
eu2018bg.bg

esa-croatia eo workshop 2020
Space powering Green Deal and Digital Economy

→ SEASAR 2018
Advances in SAR Oceanography
7-10 May 2018
ESA-ESRIN | Frascati (Rome), Italy

**→ SECOND MAPPING URBAN AREAS
FROM SPACE CONFERENCE**
30-31 October 2018
ESA-Esrin
Frascati, Rome (Italy)

Larger scale events



Hints, tips and a distillation of previous experience

DISCLAIMER: the following information is intended to be illustrative examples

It DOES NOT constitute actual proposal content or explicit recommendations from ESA

Proposal scope

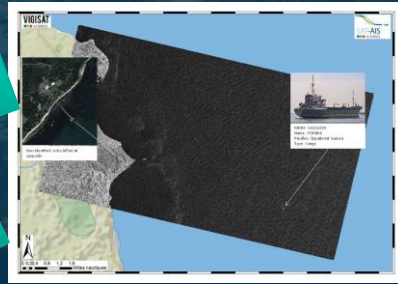
- Build a capability for future exploitation (commercial, ESA projects, H2020/HE. LIFE+ etc)
- Outcomes should be stand-alone complete
- Build on current state of the art
- Leverage Maltese marginal advantages
- Use existing EO datasets to do something concrete

Proposal Technical Content 1 - starting points

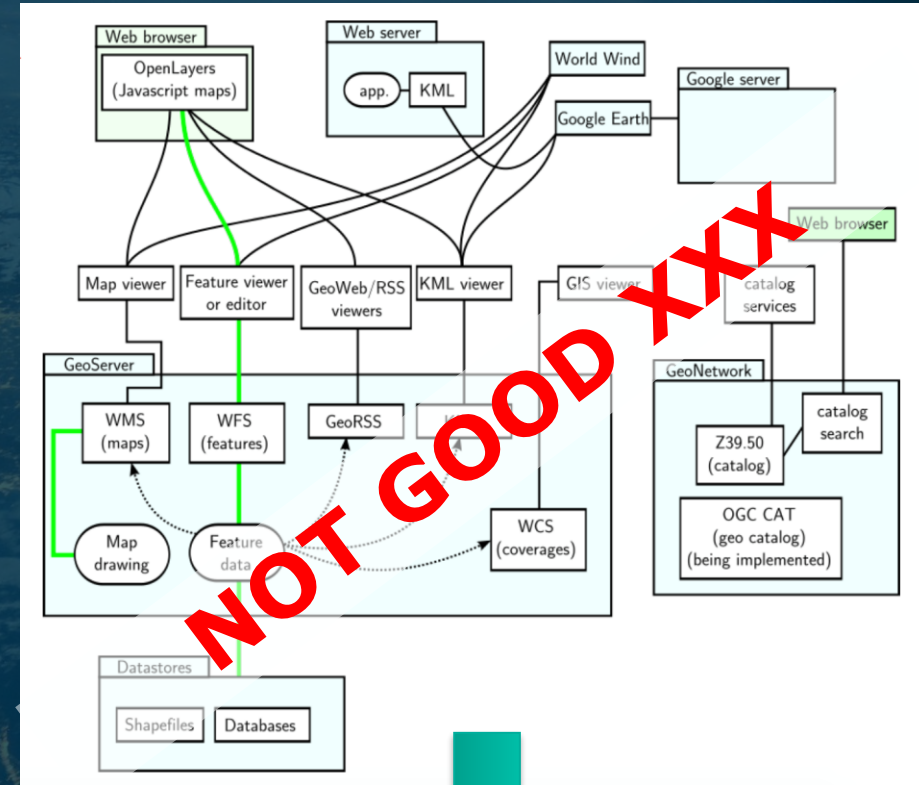
- Do you understand the characteristics of the data involved and the issues to be addressed with respect to what you want to develop?
- What is the technical capability you want to develop:
 - What does it do?
 - What performance levels can be achieved?
 - What are the resources utilized?
 - What validation/assurance can you provide?
- Why is your proposed technical solution optimal for what you want to achieve (in terms of capability, performance etc)? What trade-offs have you performed? How are you building on the current state of the art and providing something new?
- Why is your proposed development worth implementing in general? Why is your proposed development worth implementing under the MCST Space Fund? What is the interest to Malta in the proposed development going ahead?

Typical problems 1

Main effort is infrastructure with little thought to the development of the underlying algorithms



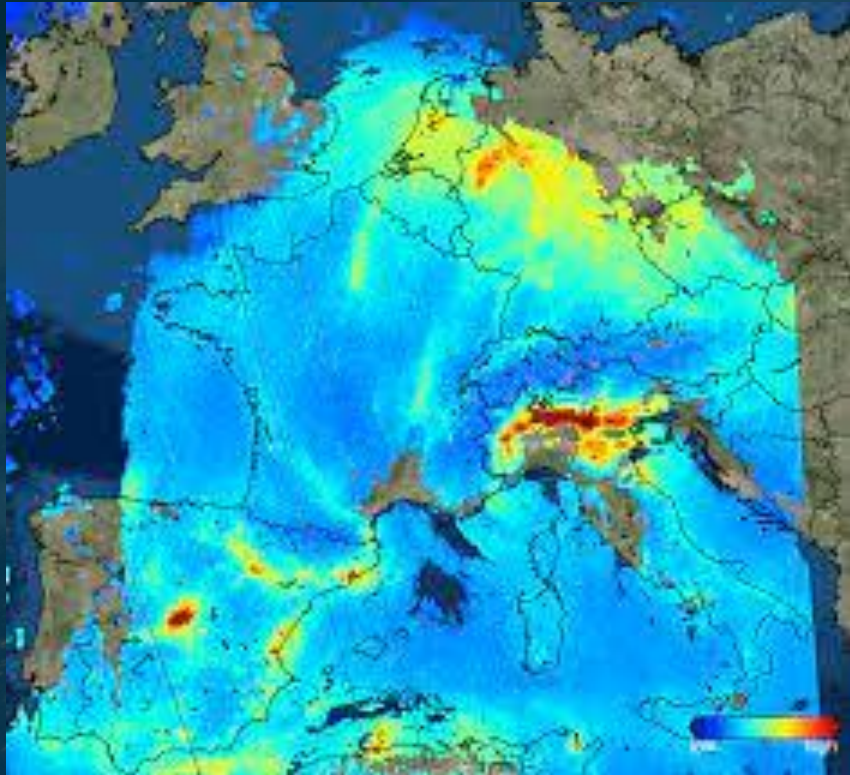
GOOD



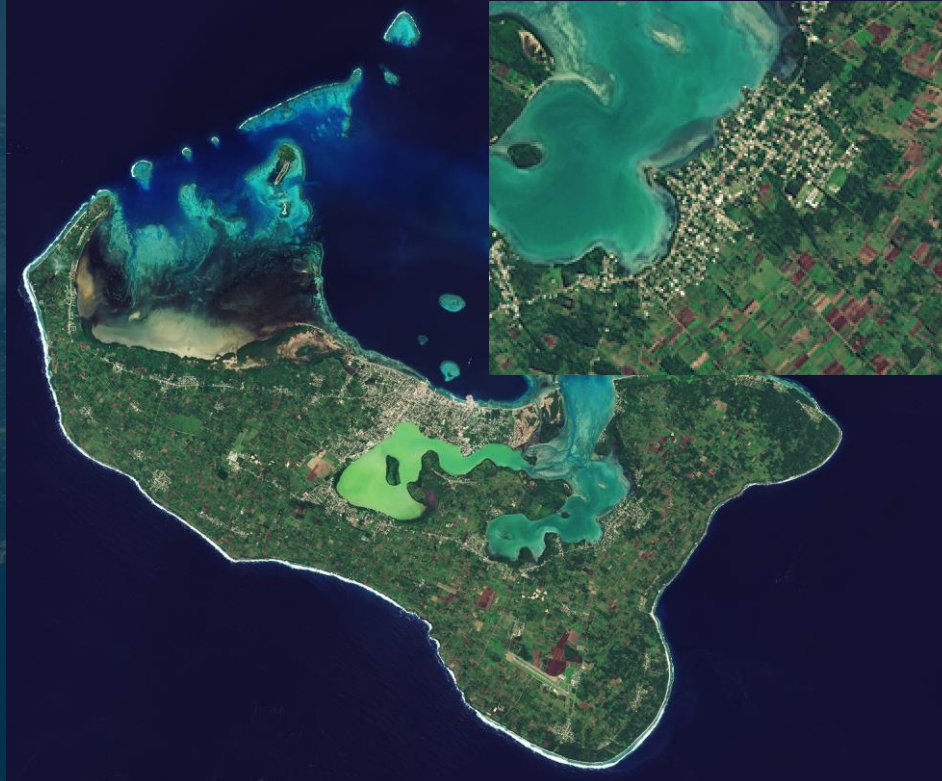
NDVI measurements for small test area for single growing season

Typical problems 2

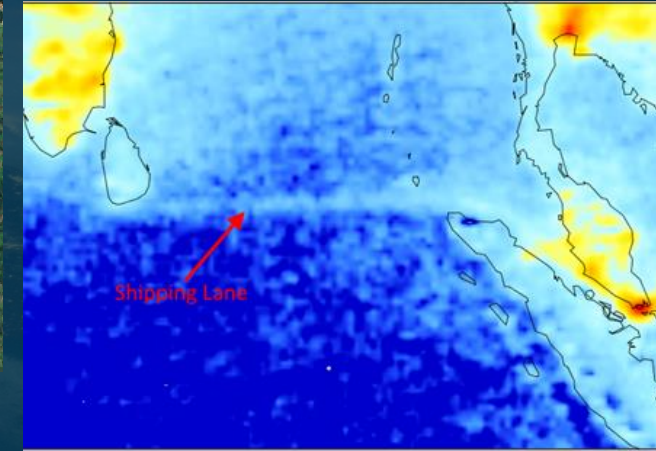
Are the Satellite EO data available and appropriate for what you want to do?



Spatial resolution/revisit



complexity/variability



Signature robustness

Typical problems 3

Lack of explicit technical content in the proposal

Proposal content

- we have a user
- we want to develop a prototype application



WP1
User Requirement
Collection

Does not enable a technical assessment of the proposal

WP2
Application/Service
capability
specification

WP N
Application/Service
capability
development

Proposal content

- we want to develop a prototype application
- We will use a ML based processing method



WP N
Literature Review
and identify model

Does not enable a technical assessment of training data, validation, method etc

WP N+1
Training
Model

WP N+2
...

Proposal content

- we have a user with the following problems and the following requirements
- we have an initial portfolio specified and agreed with the user



WP1
User Requirement
and Service
Capability
Consolidation

WP2
Service Capability
Development

WP N
...

Your technical proposal should enable:

1) A technical assessment of:

- The overall objectives (credibility, relevance)
- The technical problems to be addressed and your proposed approach for addressing these
- The technical steps to ensure the objectives are achieved
- Consistency of proposed development methodology with state of the art and the identified problem areas

2) Technical management of the proposed activity if your proposal is selected:

- Clear deliverables as outputs from one WP forming inputs to other WPs
- Clear review points where progress can be assessed and future developments optimized
- Clear methodology to maintain stakeholder engagement and inputs/feedback
- Explain everything – don't assume any knowledge on the part of reviewers (**if you don't put something in the proposal the reviewers cannot take it into account**)

The problem areas and risks discussions are intended to cover TECHNICAL and PROGRAMMATIC problem areas and risks that may arise DURING the work and cannot be pre-emptively resolved prior to the start of work.

Correct identification of risks **shows you understand the work** you are proposing and separates you from bidders that do not understand the work

Discussion of risks and problems should include a mitigation plan:

- What is the potential impact and what actions will you take to minimise the risk of it becoming a reality?
- What will you do if it does become a reality?
- Provide details to show those mitigating actions are credible and feasible and to show your credibility in addressing these problem areas

Good Example:

“The procured coffee machine breaks down during service”

Mitigation options that will be investigated:

- a) procure a spare machine,
- b) procuring a ready source of spares
- c) ensuring a rapid call out repair service

Prevention actions:

- a) ensure regular servicing & inspection by company X who have N years experience in this
- b) Pre-procure and keep on stock the main parts most at risk of failure

Bad Examples:

“We don’t have someone to make the coffee and are not sure to be able to hire someone.”

“We might not be able to afford a coffee machine.”

- Does the proposed approach demonstrate a clear technical response to the stated requirements
- What are the key trade offs? What are the key decision points?
- Implementation:
 1. What are the key stages/ steps in the work/activity?
 2. What is the goal/ purpose of each step?
 3. What will be done in each step?
 4. How will each step be assessed, controlled, reviewed or validated?
 5. How does each step relate to the others?
 6. If there are subcontractors: How is the work broken up between companies? Why?
- Is the work is adapted for the proposed development, guided by practical experience & insight?
- Is it clear exactly what work will be done ?
- Data sources & needs are quantified & justified and matched to the objectives?
- Does the proposed implementation approach ensure comprehensive response to user needs ?
- Is there a real mechanism for feedback to adapt EO capabilities to user feedback?

- WBS should avoid conflicts of interest (eg overall project manager should not be managing level 2 WPs with a separate manager for intermediate level 1 WP)
- Key personnel – if they are not allocated more than 10-20% of their time to the project then they are not key personnel unless their small contribution is critical to the project success
- Do not overdo the management effort – management should be a defined percentage of the overall activity and extensive requirements for subcontractors to also execute management roles are not clear
- There is no need for a steering board/stakeholder committee etc
- Manager should have suitable experience
- Describe work (bullets) at sufficient detail in each WPD to understand level of analysis performed, work flow within the WP, reviews to be held etc. Avoid generic ambiguous high level descriptions (e.g. 'Perform design')
- Outputs are all deliverables produced, ensure consistency with Deliverables list and deliverable identifiers – be clear what are actual deliverables to MCST and what are just activities, outputs, decisions etc
- Effort allocated to each WP should be consistent with scope and objectives to be achieved

- Generic letters of support are better than nothing
- Stronger option - letters of support showing:
 - Stated interest in specific elements to be developed and related mandate
 - Demonstrated interest/ideas for how to use the outcomes
 - Contribution of resources (data, personnel effort, other proprietary assets)
- Proposed development and validation approach should demonstrate:
 - How is stakeholder engagement maintained?
 - How do they contribute feedback and at what points?
 - How is the feedback acted upon?
 - What happens when the project is completed

Questions/Answers...