The Coastal Thematic Exploitation Platform
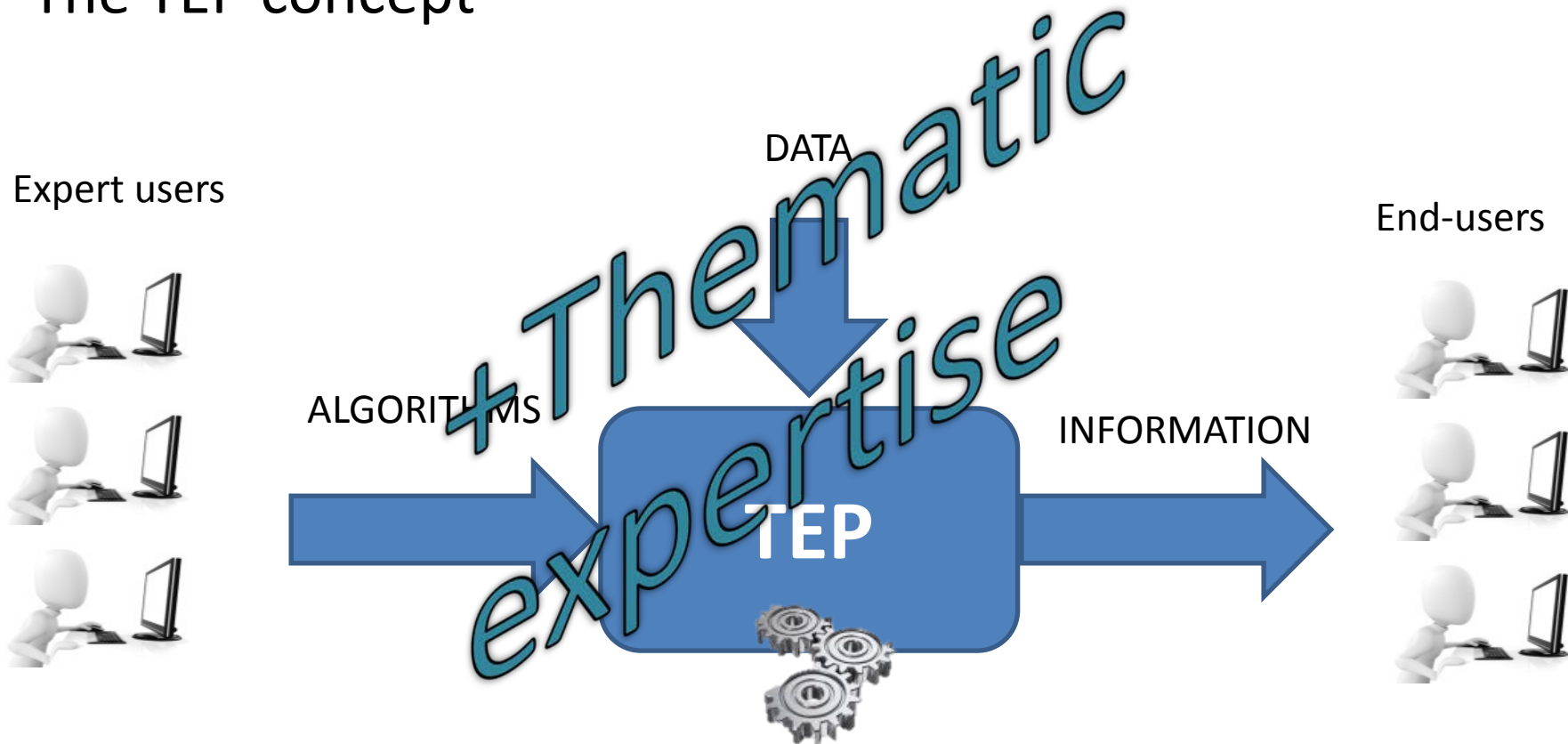# Exploring and Monitoring European Coastal Areas

European Space Agency

- The TEP concept

Expert users
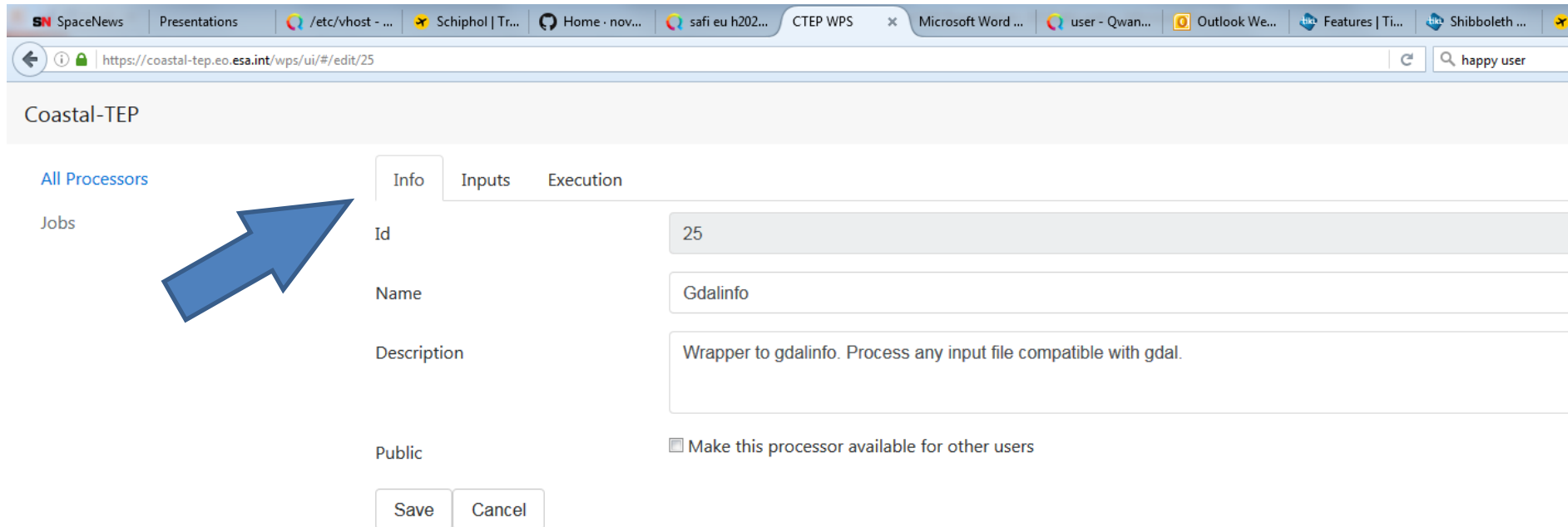
DATA

End-users

ALGORITHMS

INFORMATION

TEP
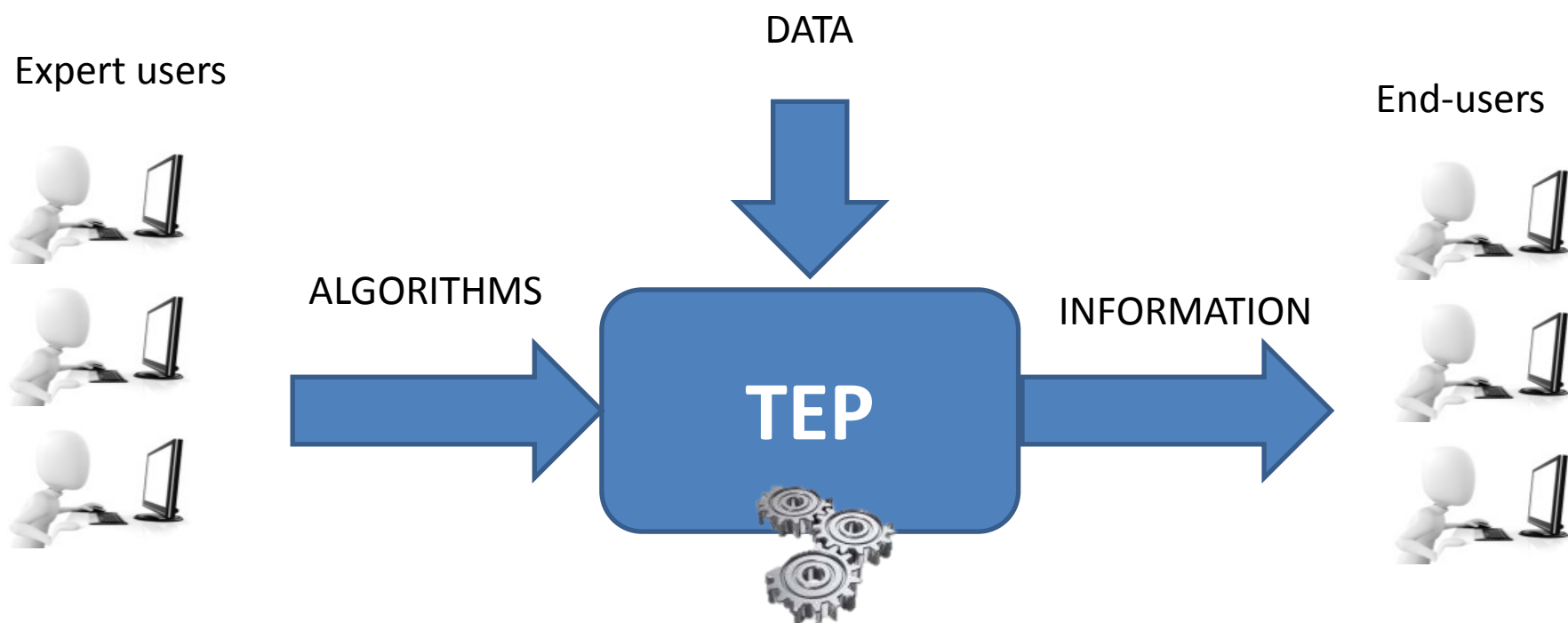
- The TEP concept

- How ?
  - "Mouse-click" based processor integration:
  - Easy to use: not all experts are geeks
  - More expert-users means more (and better) software integrated
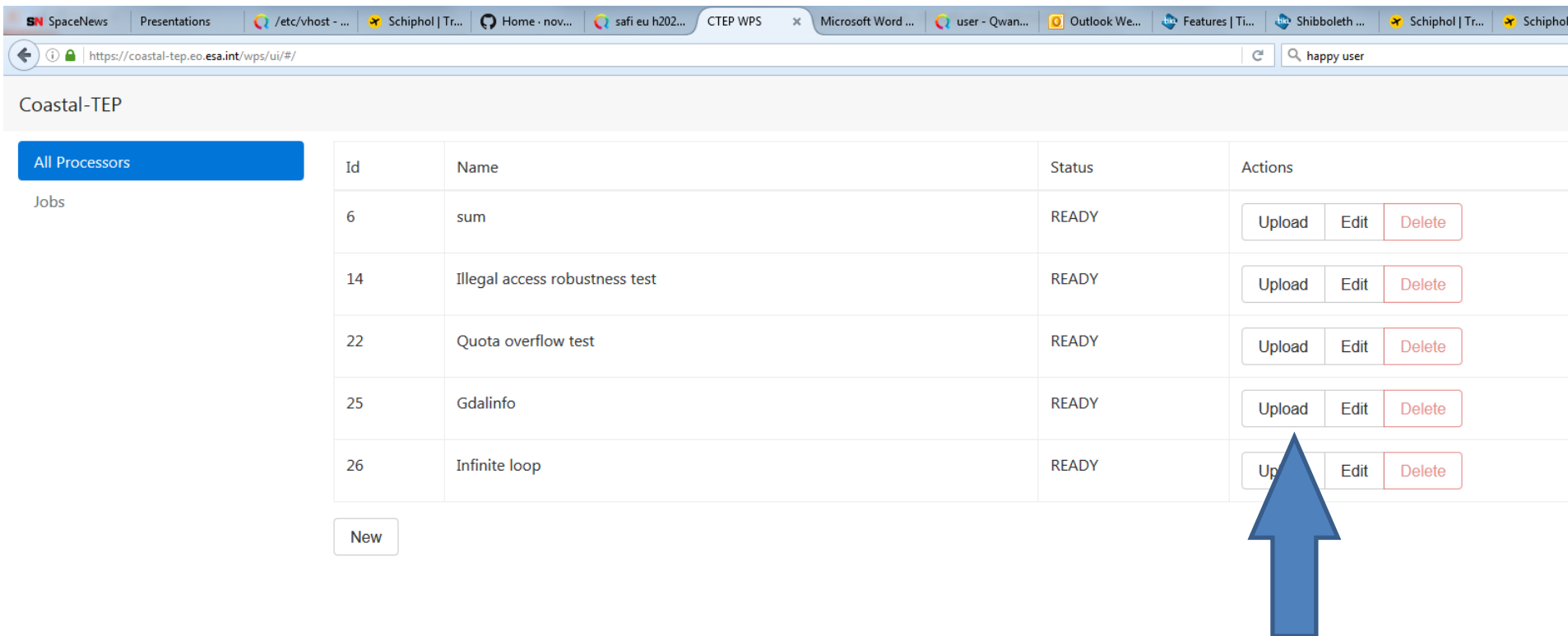 - More software available means more information for end-users

Bringing users to the data

- How ?

Bringing users to the data

- How ?

- ## How ?

The Coastal Thematic Exploitation Platform: thematic aspects

- Users need
  - Monitoring of coastal habitat
    - Land and underwater in shallow areas
    - Classification and change detection
  - Monitoring of coastal geology
    - Coast line
    - Bathymetry
    - Optical inversion, wavelength processing…
  - Monitoring of coastal weather conditions
    - Storm surges
    - wind and waves
    - Radar Altimetry and radar imagery

- Users need
  - Monitoring of coastal water quality
    - Water constituents, chlorophyll concentration and turbidity @ high resolution
    - Bio-geo-physical optical inversion

The Coastal TEP : thematic scope

- Data archives: EO data
  - Copernicus archive accessed through partnership with CNES (PEPS)
  - GlobColour: 25 years of Ocean Colour Level 3 data
  - Sea Surface Temperature (GHRSST)
  - Coastal Altimetry products (CTOH)
- Data archives: In-situ
  - MERMAID bio-optical measurement database
  - Bio-Argo profilers
  - Tidal gauge measurements
- Other data
  - Semantic features database

- Processing and tools: generic data mining/extraction tools
  - Extraction of time series over an area or pointwise extractions
    - Statistical processing
    - Averaging, trend detection
    - Relying on parallel processing
  - Classification and feature detection
  - Change detection
  - Data fusion in-situ/satellite

- SAFI project: use of information extraction tools to generate a service to support fisheries and aquaculture
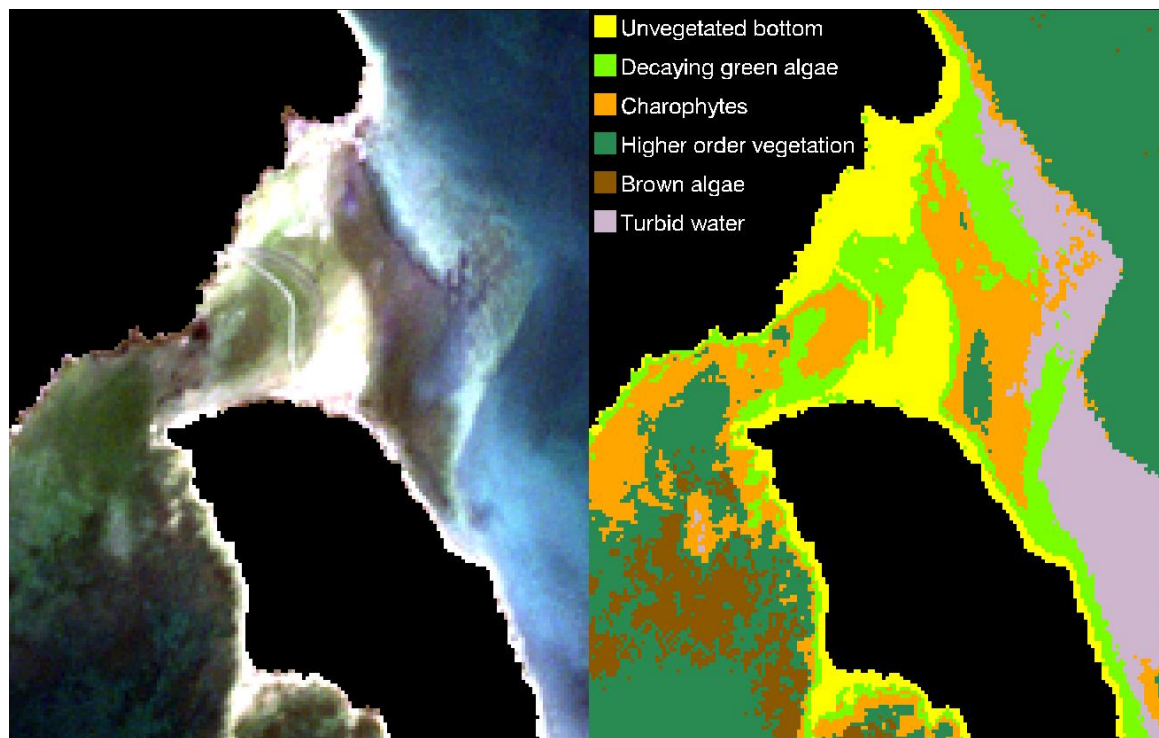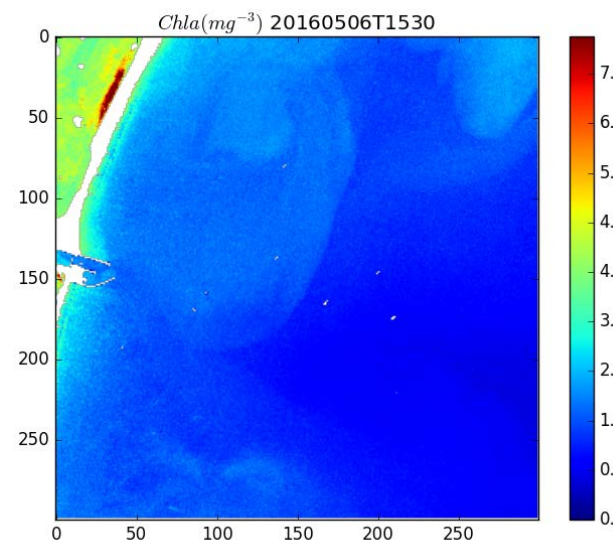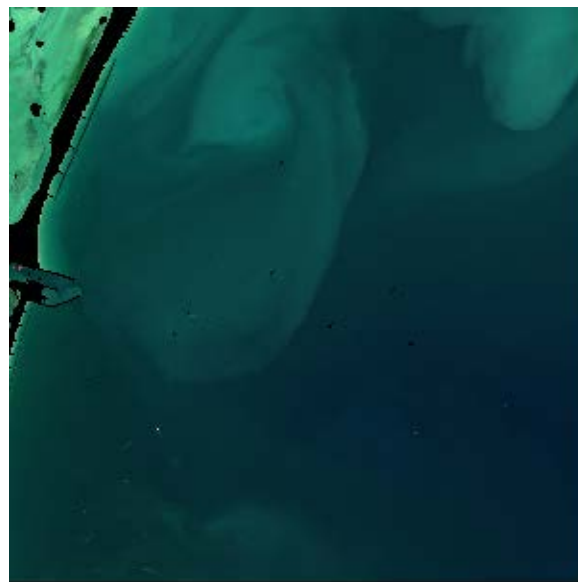
- Bathymetry and benthic classification with Sentinel 2 data
  - Collaboration in preparation with T. Kutser (U. Tartu)

- Processing and tools: thematic processing
  - Atmospheric correction over water and water constituent retrieval with Sentinel 2 data

Catalysts software is our passion · cnes · CONSIGLIO NAZIONALE DELLE RICERCHE · DLR · Daithi O'Murchu Marine Research Station · planetek italia · ThalesAlenia A Thales / Finmeccanica Company Space · TERRASIGNA · UCC Coláiste na hOllscoile Corcaigh, Éire University College Cork, Ireland
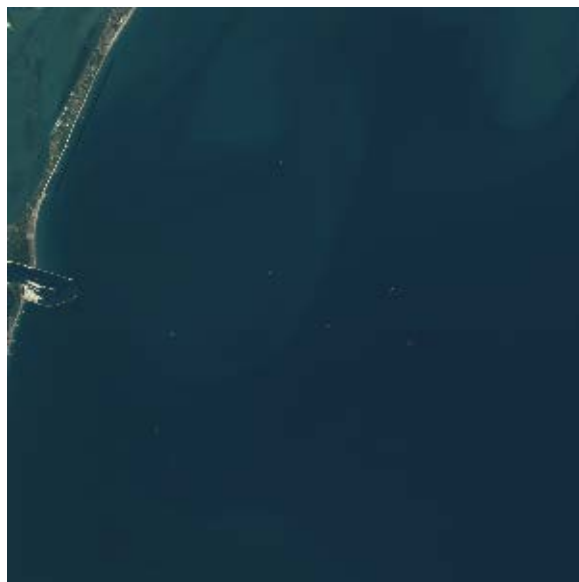
coastal

- Data fusion tools for satellite altimetry and tidal gauge measurements, with application to storm surge monitoring
  - Collaboration with CNR Italy
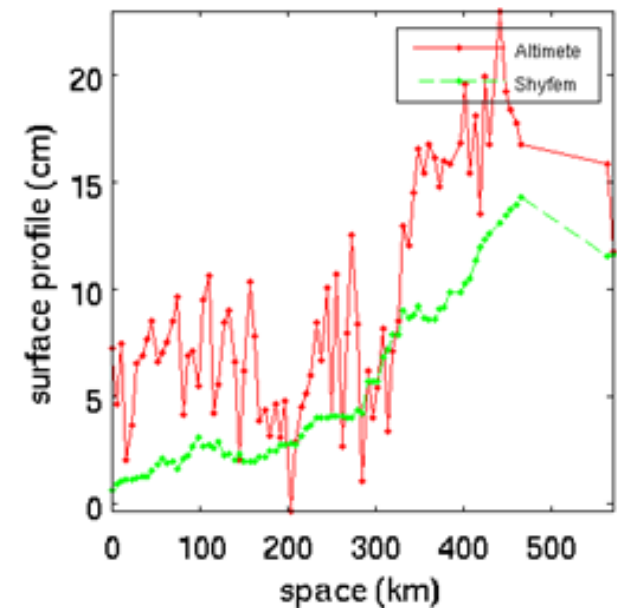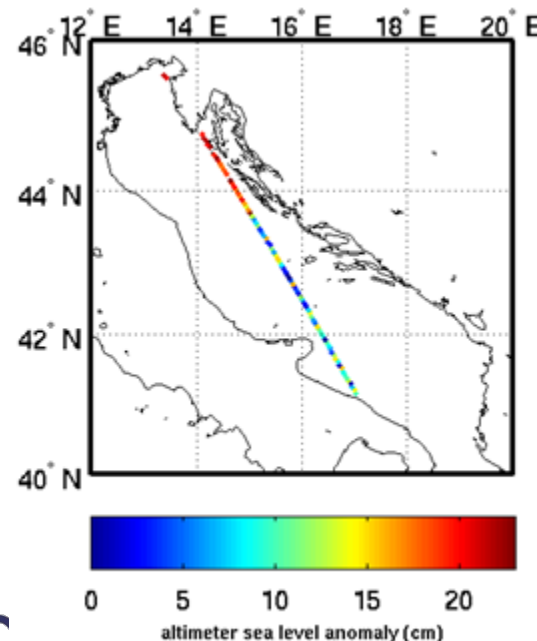
- Integration of a semantic feature database
  - Collaboration with DLR, Germany
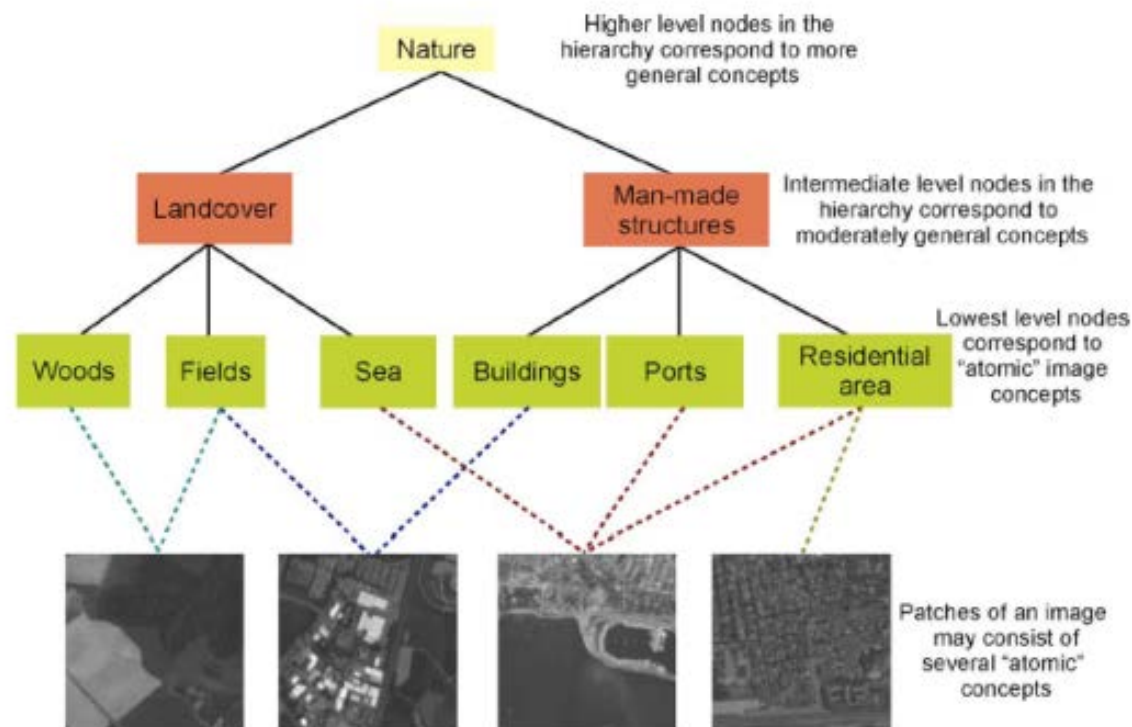
- The Coastal TEP main development phase is finishing
- Pilot projects are starting, scientific and technical challenges of coastal areas need to be adddressed
- Open questions and challenges:
  - Have we managed to make processor integration easy ?
  - Is the platform robust and secure ?
  - How difficult is it to handle parallel processing (map/reduce type) ?
- The future:
  - TEPs have been designed as "plug-and-play" systems which can be installed on copernicus-ready infrastructure
  - This will ensure that the concept can adapt to the rapidly moving environment of the Copernicus data infrastructure