Open service network for marine environmental data

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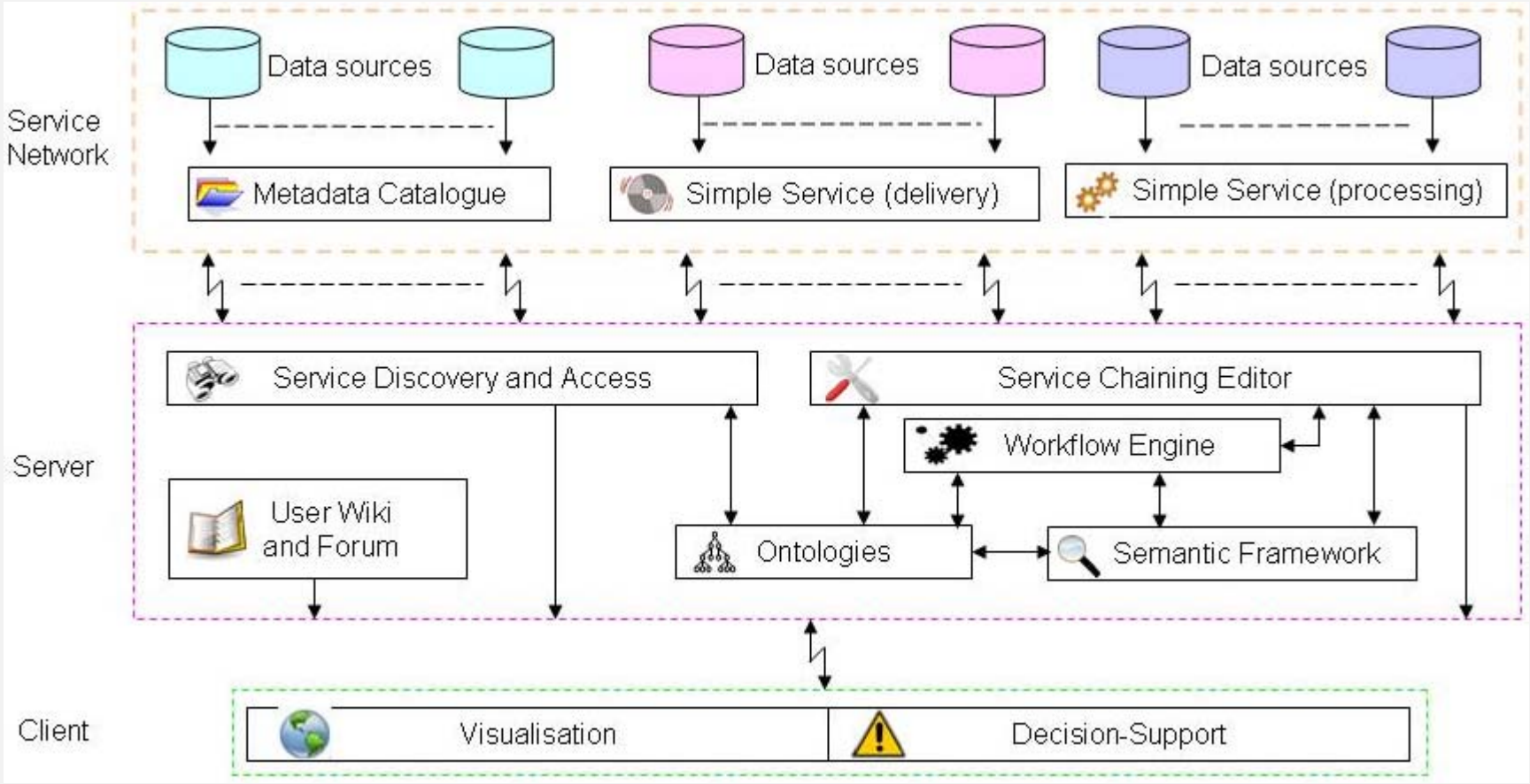
Outline

- Objectives
- NETMAR System of Systems concept
- Pilots
- EUMIS portal and components
- Summary

Objectives

- NETMAR aims to develop a ***pilot European Marine Information System (EUMIS)*** for searching, downloading and integrating satellite, in situ and model data from ocean and coastal areas. It will be a user-configurable system offering ***flexible service discovery, access and chaining facilities*** using OGC, OPeNDAP and W3C standards. It will use a ***semantic framework coupled with ontologies*** for identifying and accessing distributed data, such as near-real time, forecast and historical data. EUMIS will also enable further processing of such data to generate ***composite products and statistics*** suitable for decision-making in diverse marine application domains.

System of Systems concept



Pilots

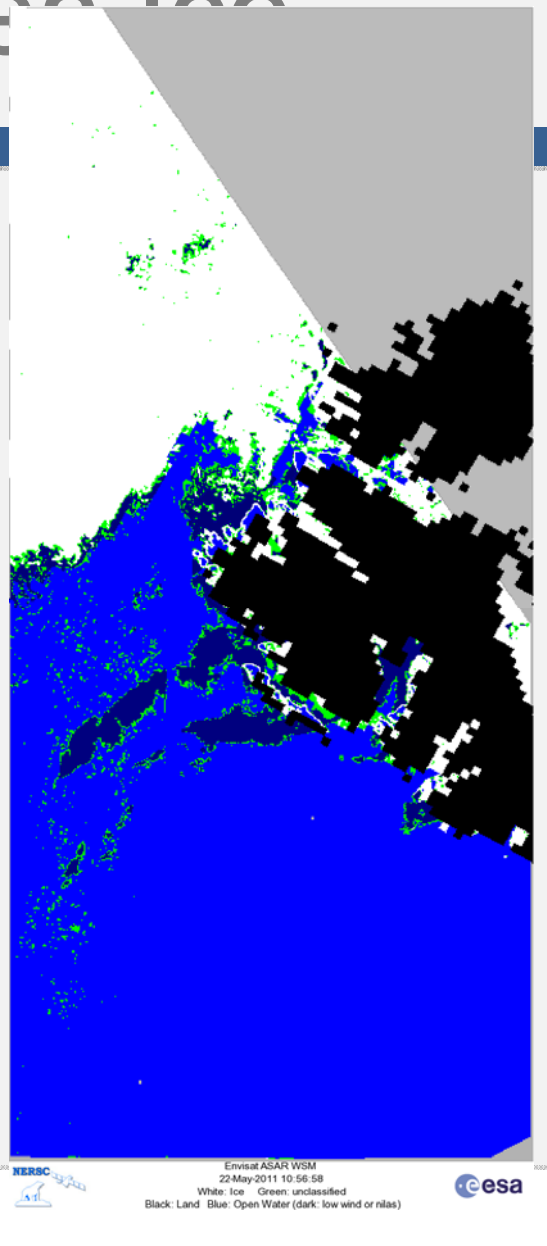
- Arctic Sea Ice and Met-ocean Observing System
- Oil spill drift forecasting and shoreline cleanup
- Ocean Colour - Marine Ecosystem, Research and Monitoring
- International Coastal Atlas Network (ICAN) for coastal zone management

Pilot 1 – Arctic Sea Ice

- Arctic Sea Ice and Met-ocean Observing System
  - Driven by observed reduction of the Arctic sea ice extent in particular during the summer months and an increasing demand for natural resources. The expected growth in ship traffic, oil and gas exploration, fisheries and tourism will increase the need for a marine monitoring and forecasting system.
  - Users:
    - Offshore oil and gas industry,
    - Fisheries authorities,
    - Environmental agencies (e.g. EEA),
    - Operational sea ice forecasting

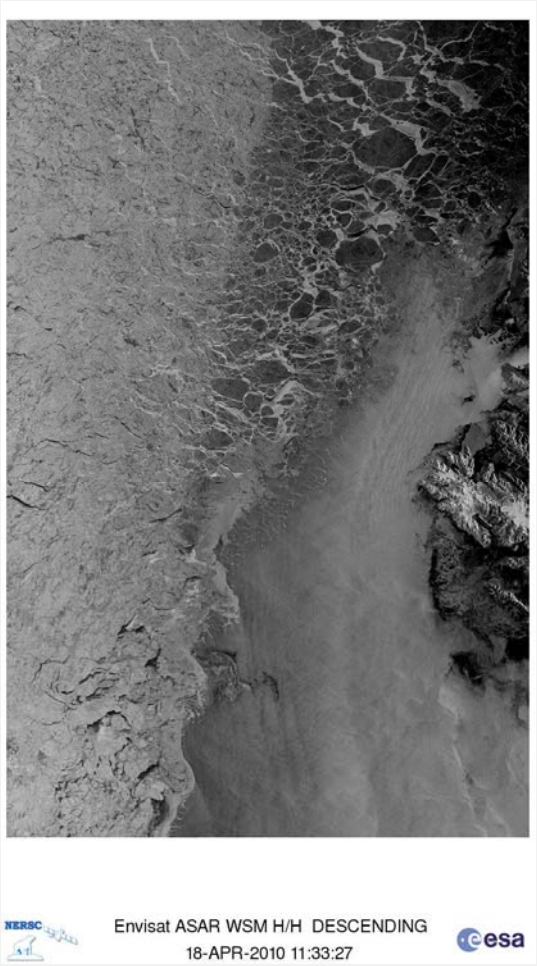
Pilot 1 – Arctic Sea Ice

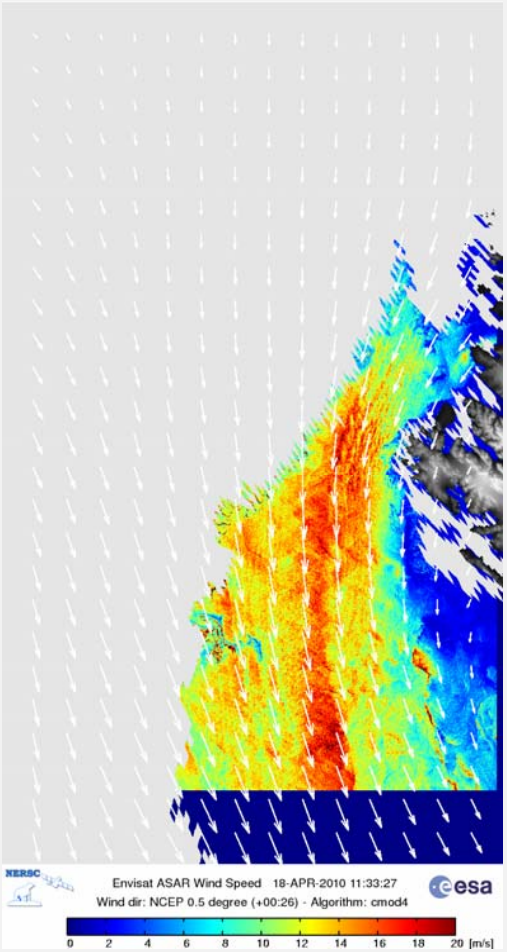
- Sea ice type classification from ASAR (NERSC)



Pilot 1 – Arctic Sea Ice

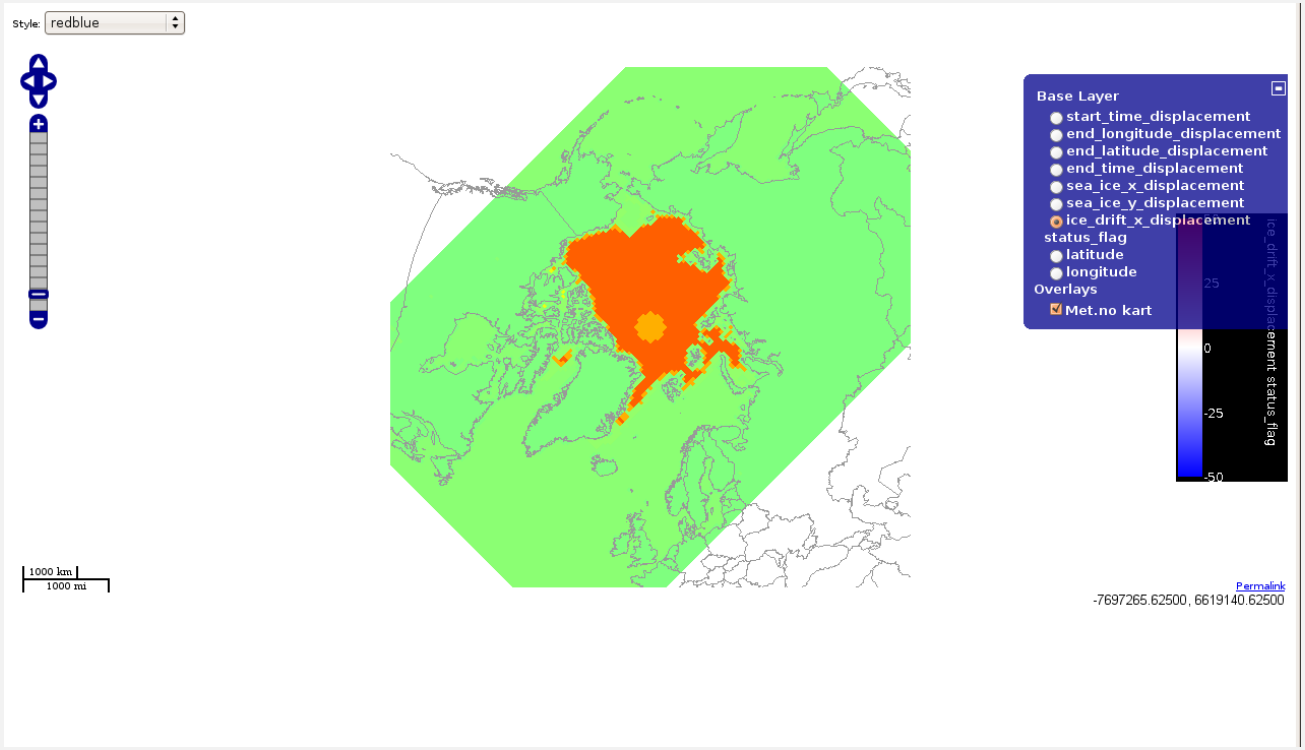
- ASAR and derived wind fields (NERSC)





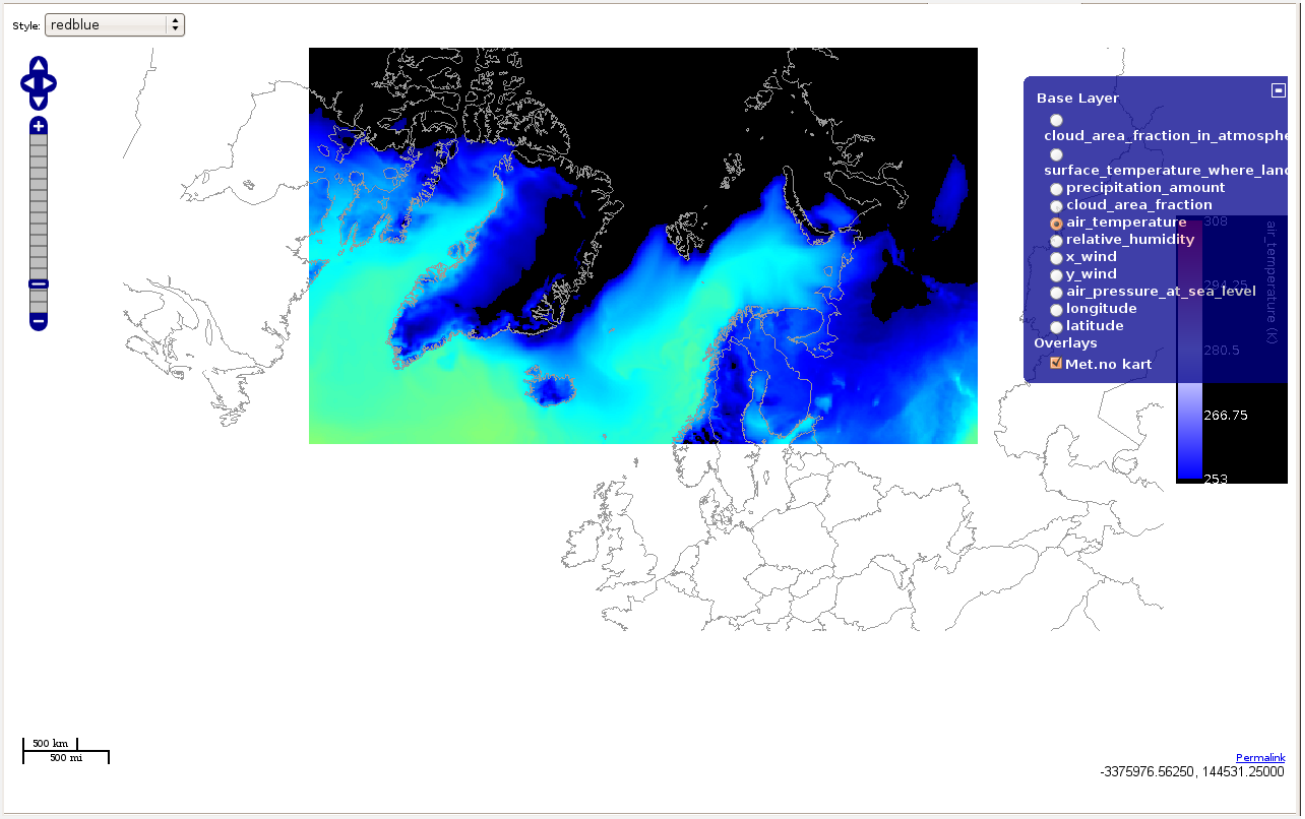
Pilot 1 – Arctic Sea Ice

- Ice drift, x-displacement (METNO, OSISAF)



Pilot 1 – Arctic Sea Ice

- Air temperature forecast (METNO)



Pilot 2 – Oil Spill

- Oil spill drift forecasting and shoreline cleanup
  - Timely access to satellite/aircraft/in situ data, as well as model predictions is critical to support efficient emergency response services during oil spill crisis situations. Focus is on improving oil spill drift forecast service in France, and collection of all operational information about onshore pollution landings and mitigation actions during the response phase.
  - Users:
    - Members of the French Slick Drift Monitoring and Prediction Committee (Cedre, Ifremer, MRCC, French Navy)
    - Decision makers in charge of the oil spill response

Pilot 3 – Ocean Colour

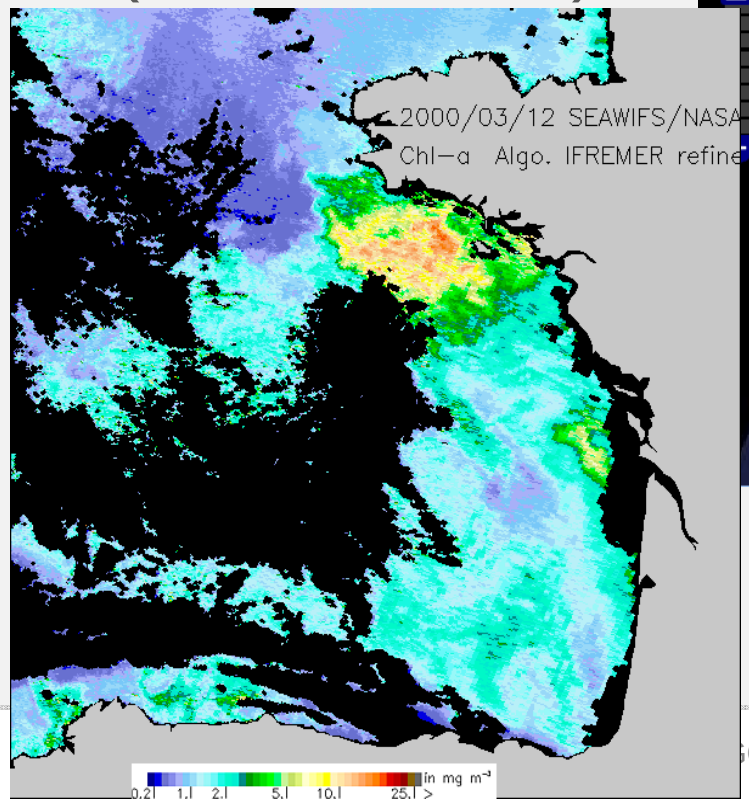
- Ocean colour - Ecosystems modelling
  - Researchers in ecosystems need to be able to identify and use long-term time series to quantify ecosystem responses to natural variability, climate change or the impact of anthropogenic activities.
  - Operational users may find it useful to compare, in near real time, contemporary satellite and in situ data in order to provide input to water quality monitoring systems, for example, on phytoplankton chlorophyll-a concentration.

Pilot 3 – Ocean Colour

- Ocean colour - Ecosystems modelling
  - Users:
    - Western English Channel Observatory (WECO)
    - The Chlorophyll Global Integrated Network (ChloroGIN)
    - Marine Ecosystem Evolution in a Changing Environment (MEECE) project
    - Department Prefectures in France
  - Products and providers:
    - Satellite ocean colour products (PML, Ifremer, MEECE)
    - Ecosystem models (PML, MEECE)
    - In situ observations (Ifremer)

Pilot 3 – Ocean Colour

- MODIS Chl-a images (PML, Ifremer)



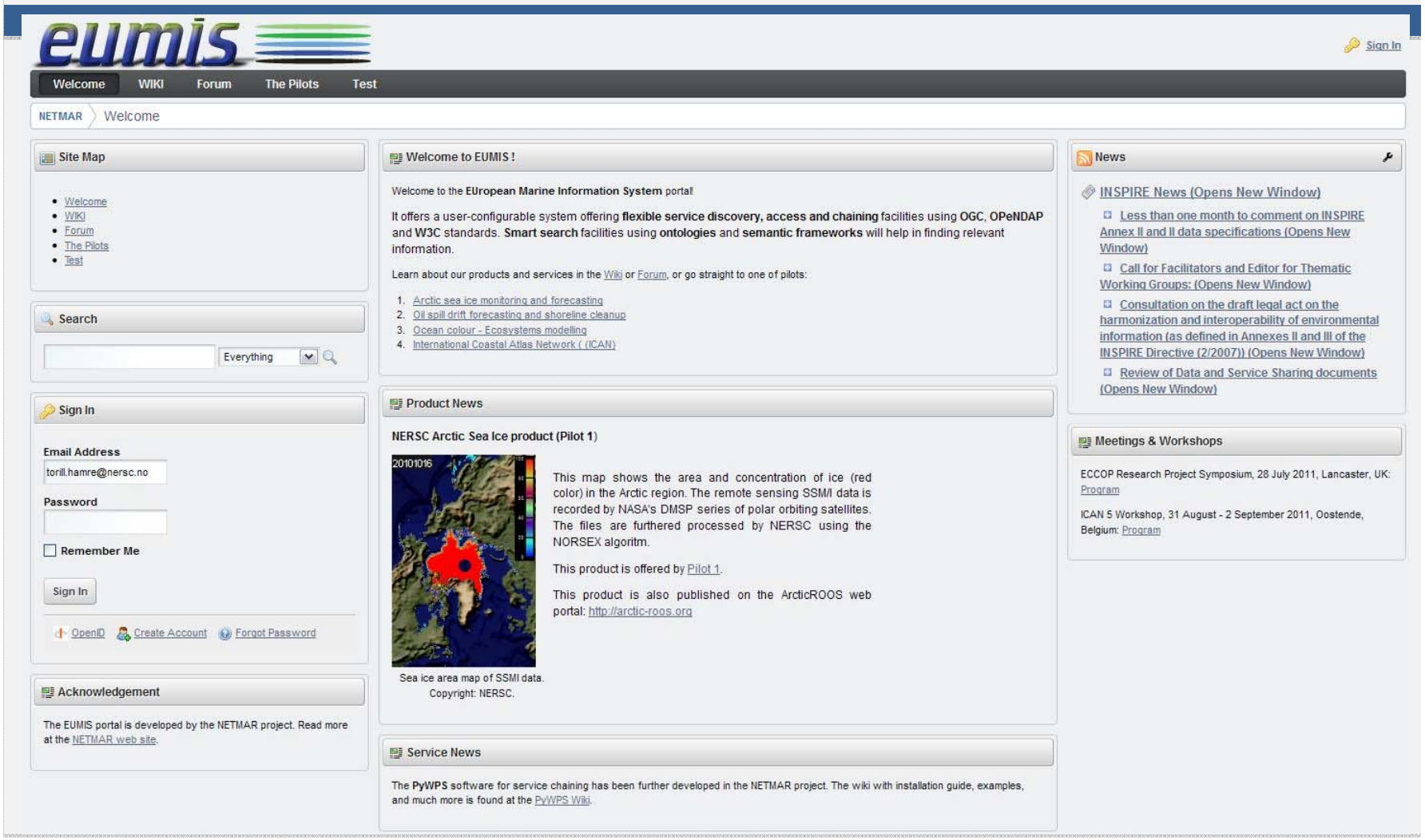
Pilot 3 – Ocean Colour

- In situ observations of temperature (Ifremer)

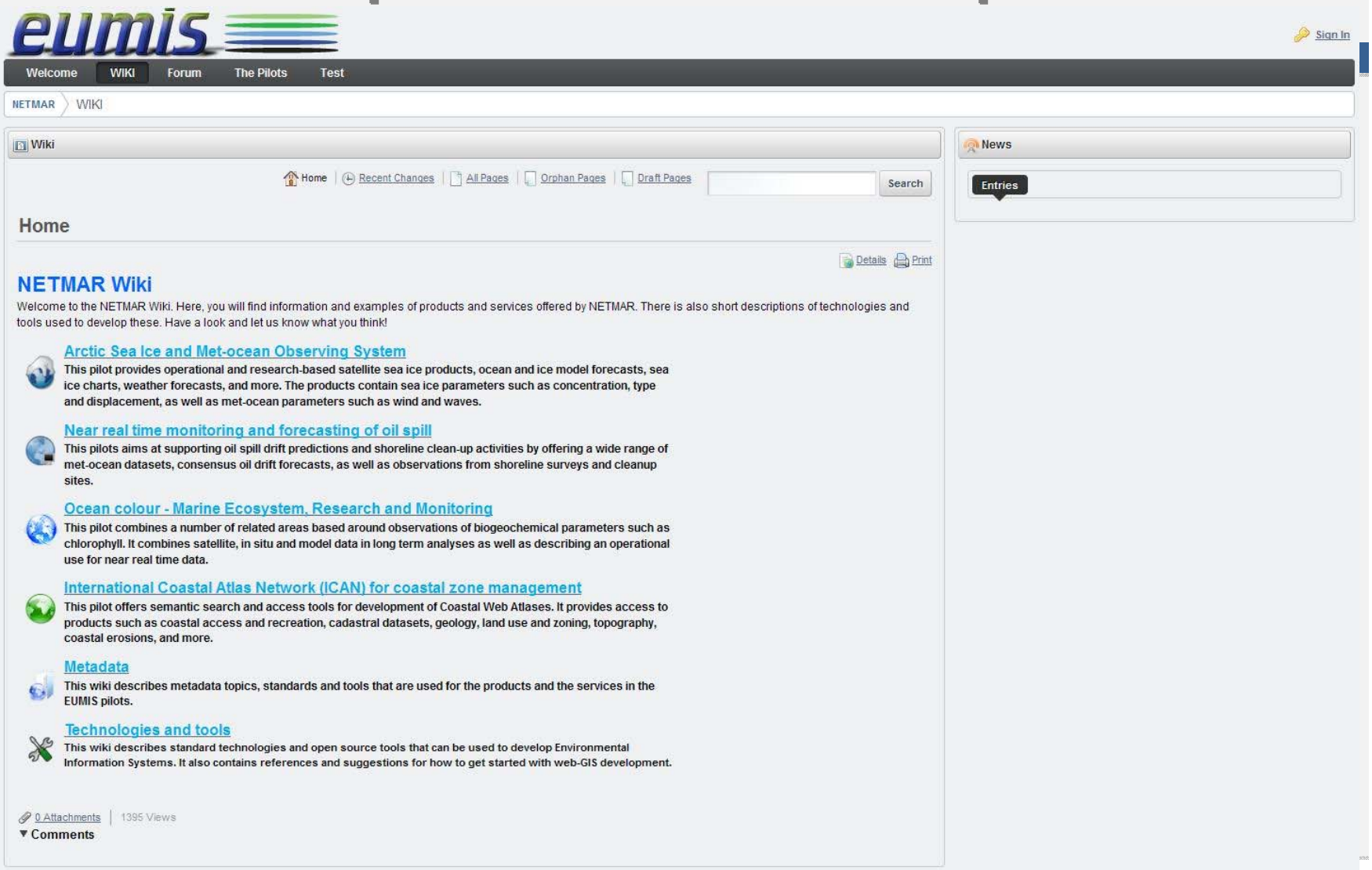
Pilot 4 – ICAN

- International Coastal Atlas Network ((ICAN)
  - Need for seamless integration of resources available in distributed Coastal Web Atlases (CWAs) to support decision-making in the coastal zone.
  - Requires flexible data and service discovery, with subsequent integration in an Environmental Information System (EIS)
  - Users:
    - The ICAN community, comprised of, among others, marine spatial managers, conservation organisations, commercial organisations

EUMIS portal and components



EUMIS portal and components



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Arctic Sea Ice and Met-ocean Observing System

Details Print

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Users

The users of the Arctic Sea Ice and Met-ocean Observing System pilot comprises of representatives from offshore and shipping companies, ship and icebreaker captains/ice pilots, national authorities, regional environmental agencies, national ice services and scientists.

The second user category, ship and icebreaker captains and ice pilots, makes both selection of sailing routes between ports of destinations as well as tactical decisions on how to penetrate through rough ice conditions when the ship (un)expectedly experience such situations. Decisions need to be made in order to operate safely and efficiently.

Products

Some examples of products offered for planning of sailing routes and convoy operations in sea ice covered areas are shown below. Satellite Synthetic Aperture Radar (ASAR) images provide detailed information about sea ice conditions as illustrated in Figure 1. SAR images can be classified by automatic algorithms (Figure 2) and trained operators of an ice service (Figure 3). Other products that are useful for captains and ice pilots include ice drift predictions, met-ocean forecasts and observations from ships and airplanes.

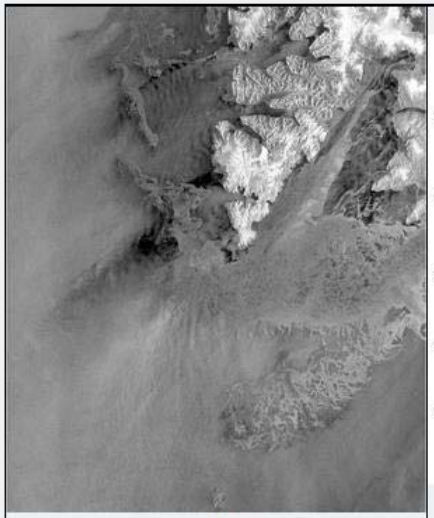


Figure 1

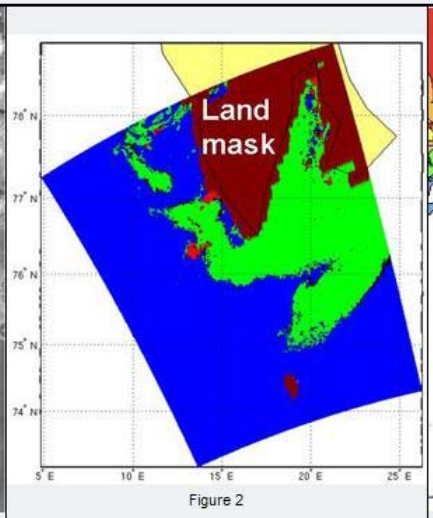


Figure 2

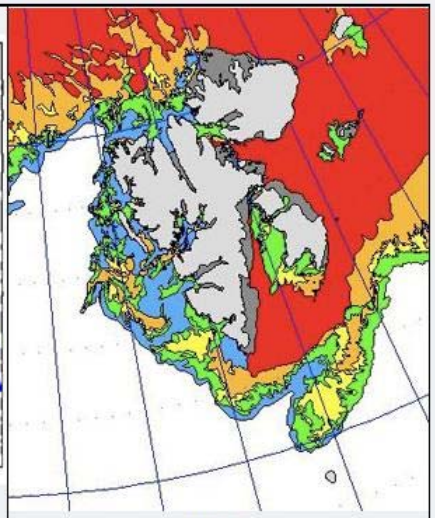
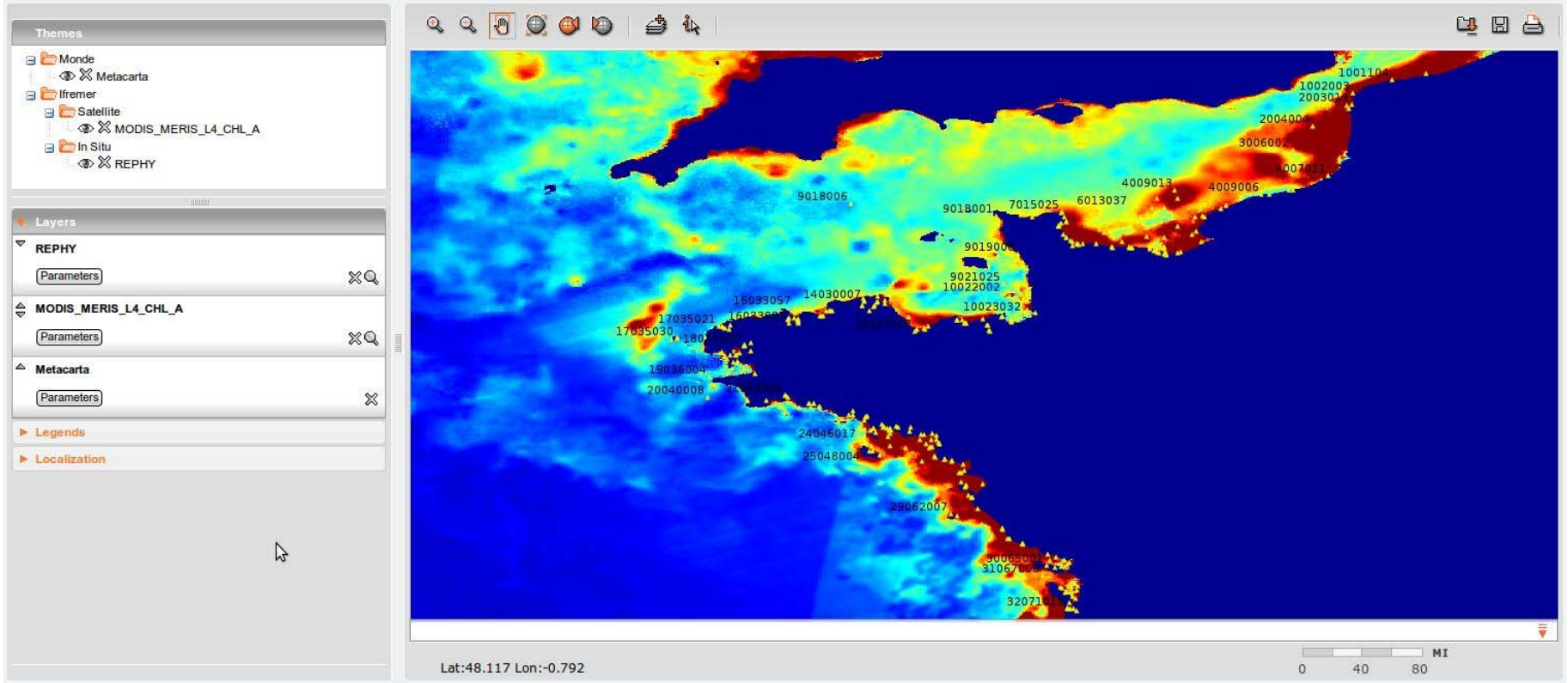


Figure 3

Services

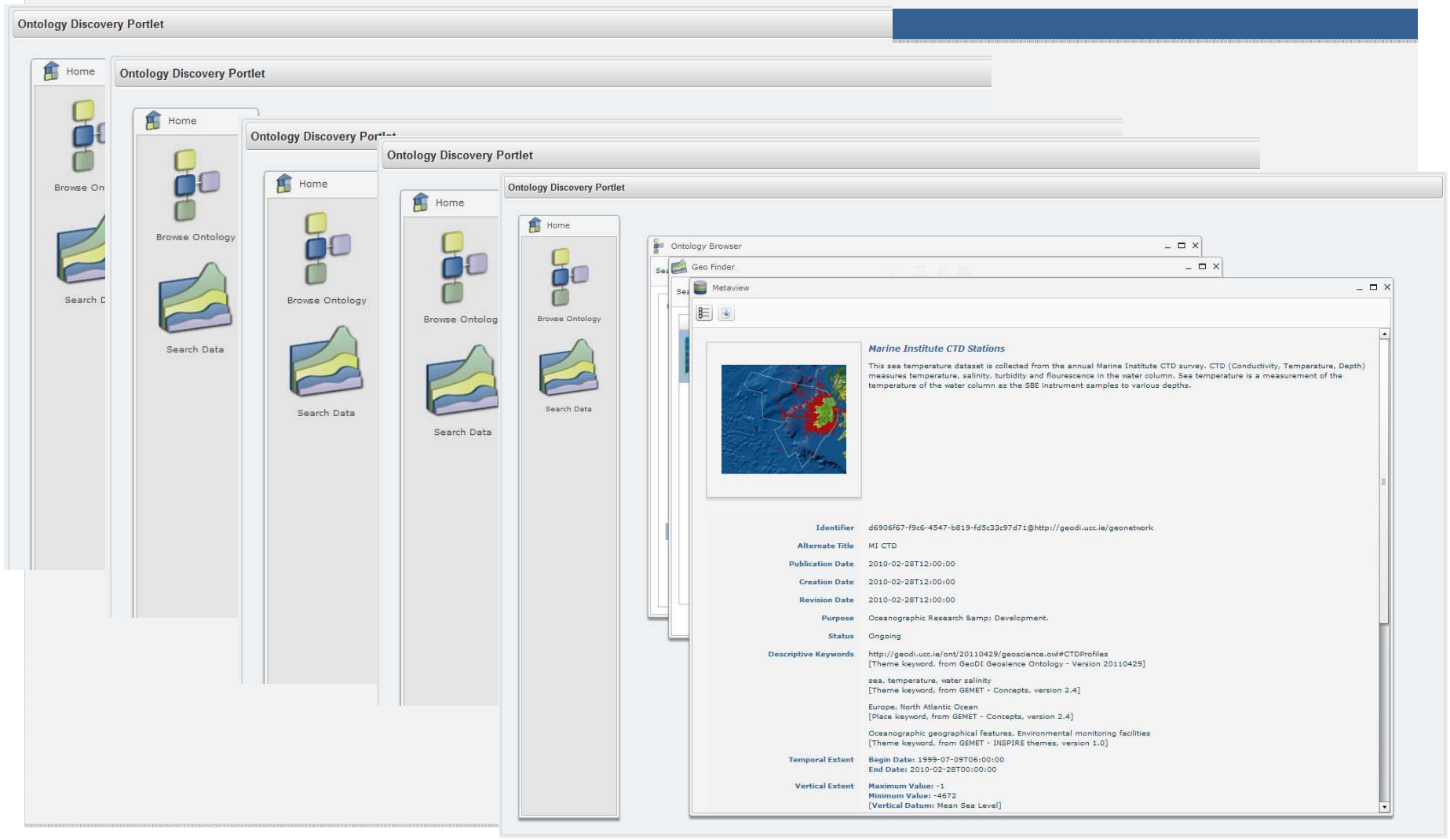
These and other products will become available through the Arctic Sea Ice and Met-ocean Observing System Pilot.

EUMIS portal and components



Example of satellite (Chl-a from MODIS-MERIS) and
In situ (Phytoplankton and Phytotoxins networks : REPHY) datasets

EUMIS portal and components



Summary

- NETMAR is developing a pilot European Marine Information System (EUMIS) for searching, downloading and integrating satellite, in situ and model data from ocean and coastal areas. A first version of the pilot, including a wiki & forum, a GIS viewer, a search and discovery client, a service chaining editor, and integrating data delivery and processing services will be available by end 2011.
- Please visit NETMAR web pages http://netmar.nersc.no/ for more information.

Thank you!

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