

# EUMIS - an open portal framework for interoperable marine environmental services

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*EGU 2012 – Vienna – 24 April 2012*



# Outline

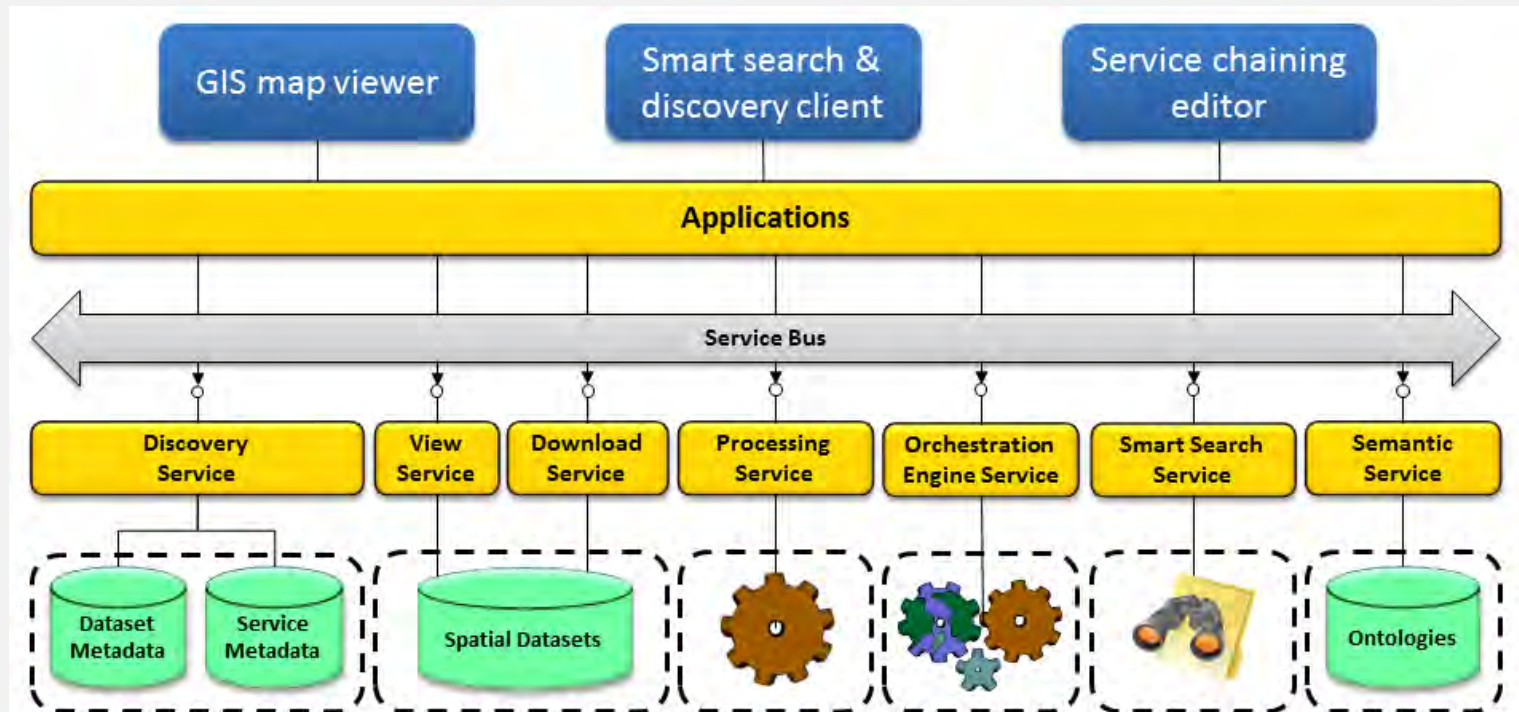
- Objectives and concepts
- Pilots
- Ontologies and semantic framework
- EUMIS portal and components
  - GIS Viewer
  - Discovery Client
  - Service Chaining Editor
- Conclusion

# Objectives and concepts

- 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 different marine application domains.

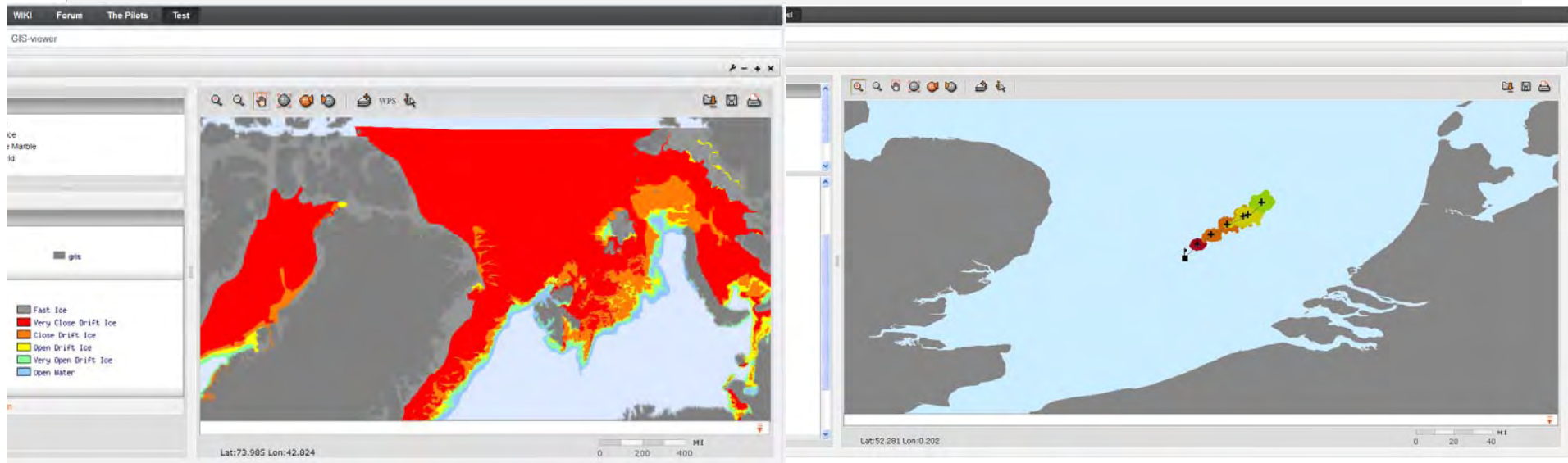
# Objectives and concepts

- NETMAR Service Oriented Architecture
  - Portal and components by JSR-168 JSR-286
  - Services by OGC, W3C and OASIS standards

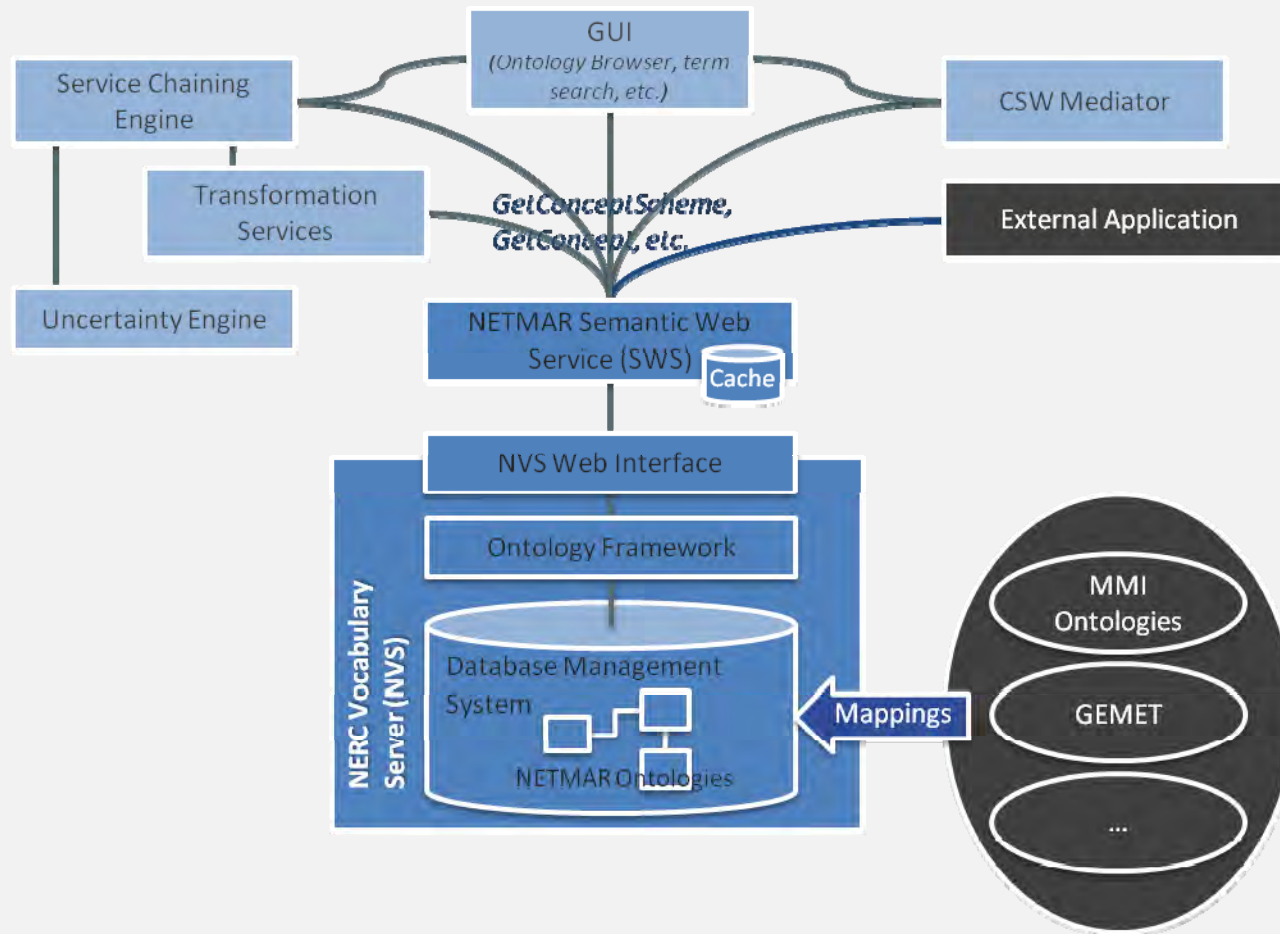


# Pilots

- Pilots in NETMAR
  1. Arctic Sea Ice monitoring and forecasting
  2. Oil spill forecasting and shoreline cleanup
  3. Ecosystem monitoring and modelling
  4. ICAN (International Coastal Atlas Network)

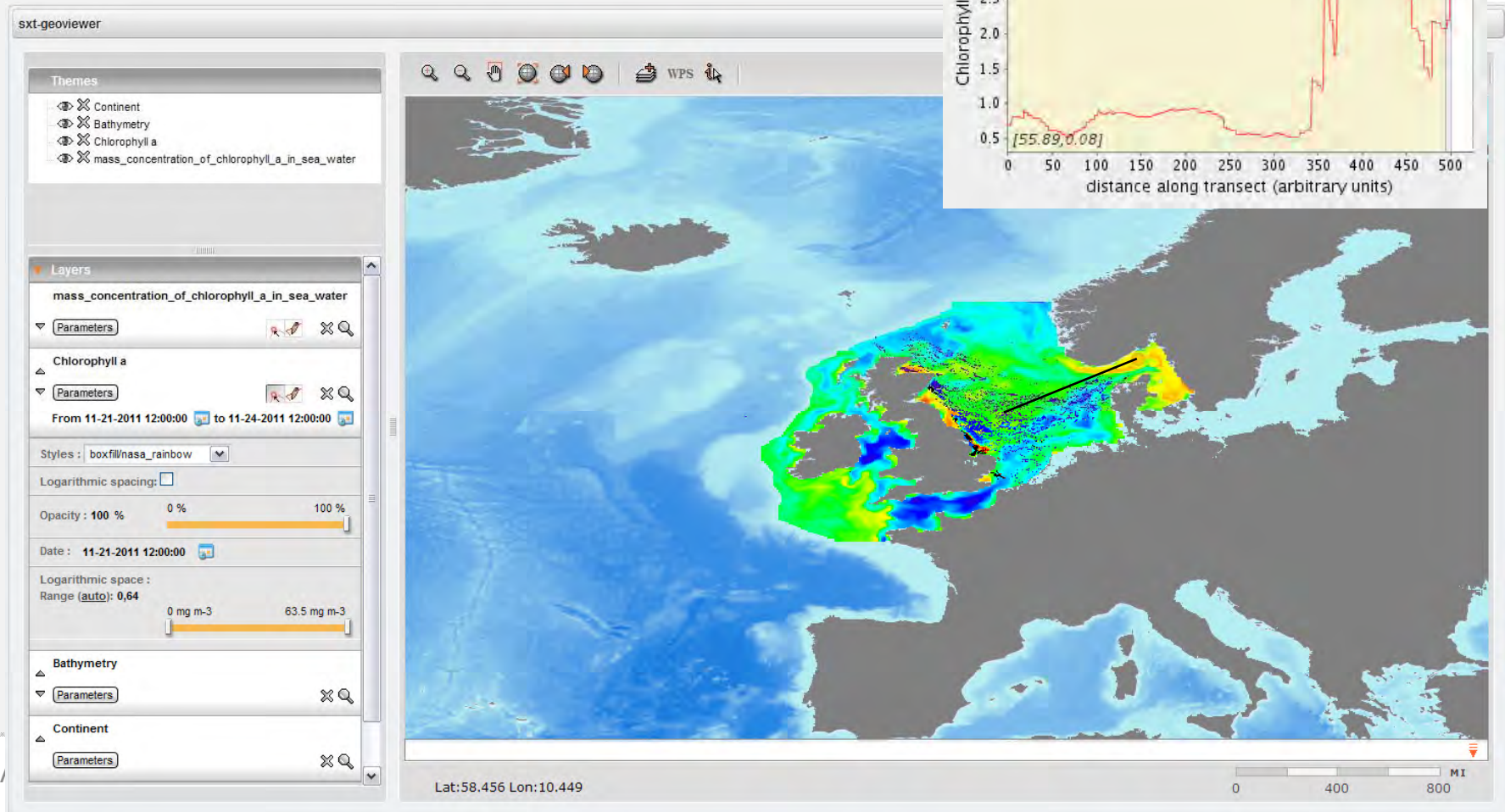


# Ontologies and semantic framework



# EUMIS portal and components

- GIS Viewer



# EUMIS portal and components

- GIS Viewer

The screenshot displays the EUMIS portal's GIS Viewer component. At the top, a navigation bar includes links for 'Welcome', 'WIKI', 'Forum', 'The Pilots', and 'Test'. Below this, a breadcrumb trail shows 'EUMIS > Test > GIS-viewer'. The main window, titled 'sxt-geoviewer', features a toolbar with icons for search, zoom, pan, and other map functions. On the left side, there are panels for 'Themes' (listing 'Met No', 'Ice', 'Blue Marble', and 'World'), 'Layers', 'Legends', and 'Localization'. The 'Legends' panel is expanded to show two sections: 'World' with a 'gris' legend item, and 'Ice' with a color-coded legend for 'Fast Ice' (grey), 'Very Close Drift Ice' (red), 'Close Drift Ice' (orange), 'Open Drift Ice' (yellow), 'Very Open Drift Ice' (light green), and 'Open Water' (blue). The central map area shows a satellite-style map of the Arctic region with these ice types overlaid. A scale bar at the bottom right indicates distances up to 400 miles (MI). The current coordinates are displayed as 'Lat:73.985 Lon:42.824'.



# EUMIS portal and components

- Discovery Client

The screenshot displays the EUMIS portal interface with several overlapping windows. The 'Home' windows show navigation options: 'Browse Ontology' (with a diagram icon) and 'Search Data' (with a 3D surface plot icon). The 'Ontology Browser' window is partially visible at the top. The 'Geo Finder' window is also partially visible. The 'Metaview' window is the largest and shows a 3D surface plot of ice concentration. Below the plot, the following metadata is displayed:

**OSI SAF Ice concentration for the Northern Hemisphere**  
Ice concentration from OSI SAF for the Northern Hemisphere. The OSI SAF Sea Ice data are developed and produced by the Norwegian and Danish Meteorological Institutes as a part of the OSI SAF project for EUMETSAT

<b>Identifier</b>	f5632725-4a1d-44a8-be92-4e14c821fd7b@http://netmar.met.no/geonetwork/
<b>Alternate Title</b>	Ice concentration
<b>Creation Date</b>	2009-08-21T21:37:11Z
<b>Publication Date</b>	2009-08-21T21:37:11Z
<b>Revision Date</b>	2009-08-21T21:37:11Z
<b>Descriptive Keywords</b>	<a href="http://vocab.nerc.ac.uk/collection/P22/current/28">http://vocab.nerc.ac.uk/collection/P22/current/28</a> , <a href="http://vocab.nerc.ac.uk/collection/P01/current/SICEAMSR">http://vocab.nerc.ac.uk/collection/P01/current/SICEAMSR</a> , <a href="http://vocab.nerc.ac.uk/collection/P06/current/UPCT">http://vocab.nerc.ac.uk/collection/P06/current/UPCT</a>
<b>Temporal Extent</b>	<b>Begin Date:</b> 2009-05-26T21:02:31.157693Z

# EUMIS portal and components

- Service Chaining Editor

**EUMIS - Service chain editor**

WSDL (+)  
Workspace (+)  
Service List (+)  
Service I/O (x)  
Export (+)

input843

Label:  
URL:  
/testdata/elev\_srtm\_30m.tif  
OR  
LiteralData:

**ExecuteProcess\_r.watersh**

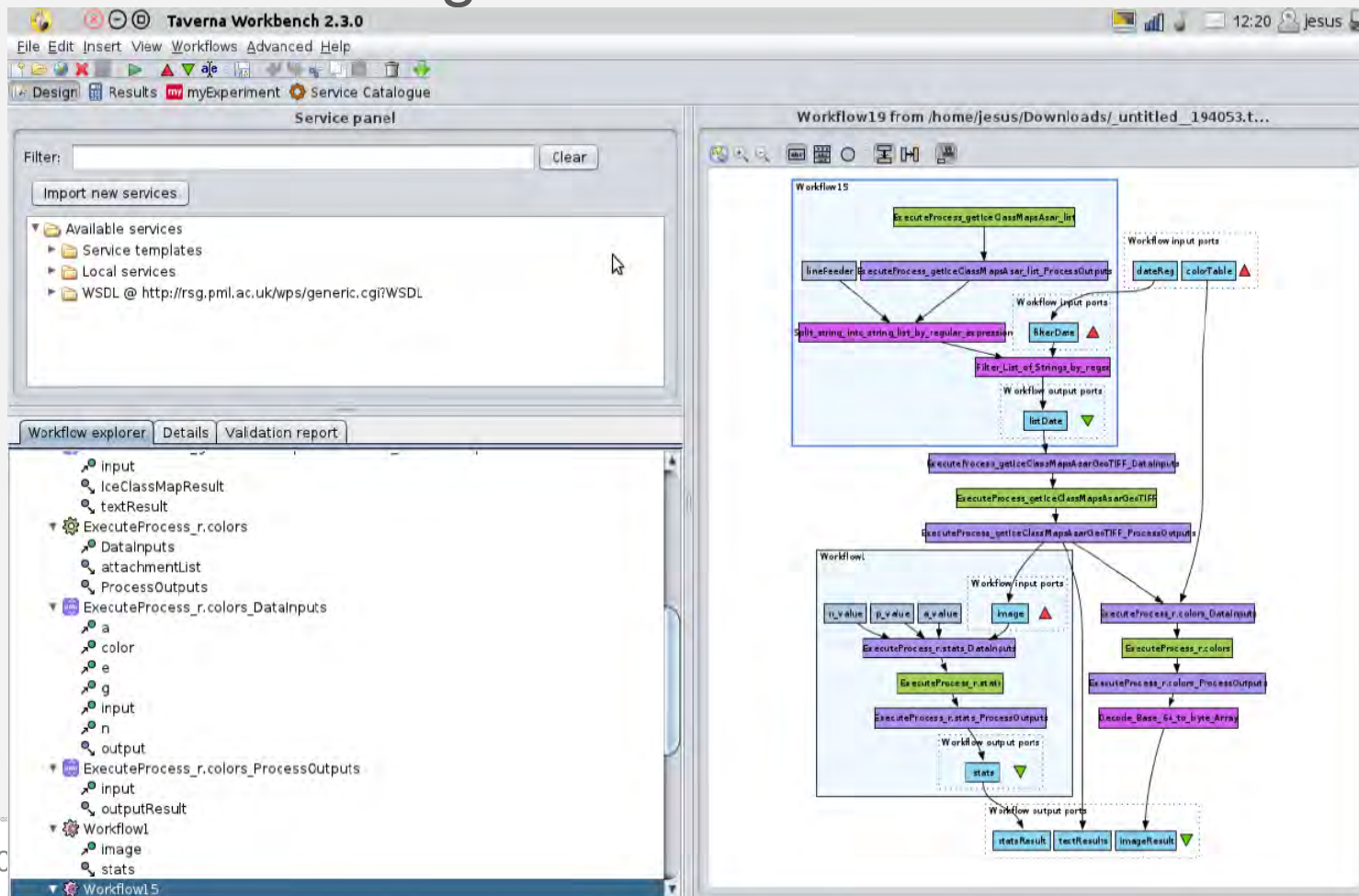
- a
- depression
- blocking
- grass\_band\_number
- elevation
- threshold
- memory
- s
- convergence
- max\_slope\_length
- grass\_resolution\_ew
- flow
- b
- m
- undefined
- disturbed\_land
- grass\_resolution\_ns
- half\_basinResult
- accumulationResult
- basinResult
- drainageResult
- slope steepnessResult

**Input and Output**

- Input container
- Output container
- Input GIS container
- Output GIS container

# EUMIS portal and components

- Service Chaining Editor



# Conclusion

- We have implemented a SOA for the EUMIS portal with a set of components
  - GIS Viewer
  - Service Chaining Editor
  - Discovery Client
  - Wiki, Forum, RSS feedsusing multiple programming languages, and deployed them within the Liferay platform.
- The first version of EUMIS was tested for the four pilots in different marine application domains. User feedback was used to improve services and components.
- Positive experience with the Java Portlet Specification standard and the portal framework. With further work EUMIS can be developed into a sustainable system.

# More information

- NETMAR Public Splinter Meeting
  - Wednesday 25 April, 13:30-15:00, Room SM5
  - Presentations + Demonstrations
- NETMAR web site: <http://netmar.nerisc.no>
- Contact Torill Hamre ([torill.hamre@nerisc.no](mailto:torill.hamre@nerisc.no))

# Thank you!

*T. Hamre<sup>1</sup>, S. Sandven<sup>1</sup>, A. Leadbetter<sup>2</sup>, V. Gouriou<sup>3</sup>,  
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# Using SOA Patterns to promote understanding across disciplines

A. Patterson

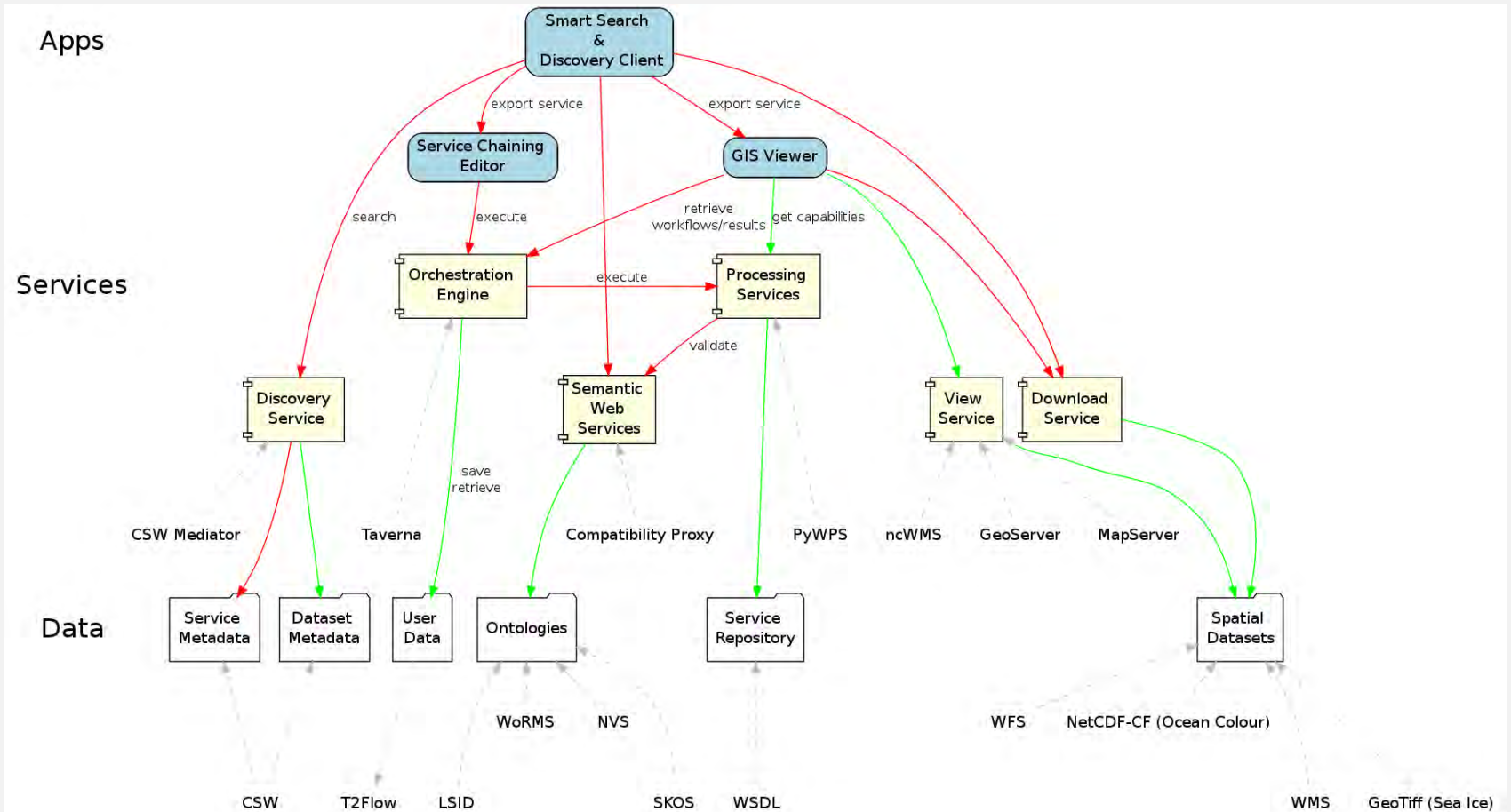
University College Cork

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*EGU 2012 – Vienna – 26 April 2012*



# NETMAR





# Definitions

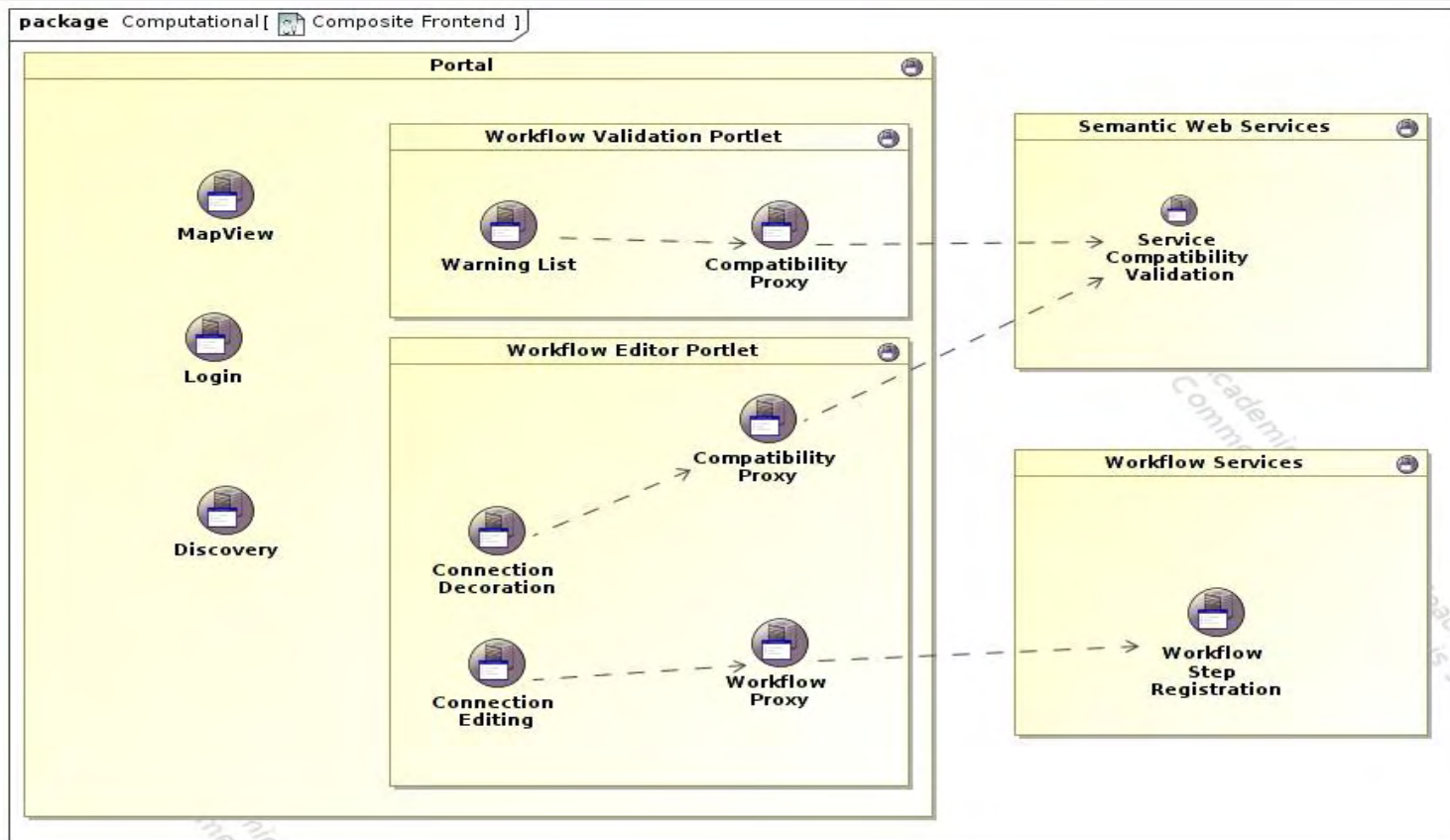
- Architecture
  - Fundamental decisions
  - Meet quality attributes
- Patterns
  - Solution + context
- Service Oriented Architecture
  - Set of patterns
  - Business logic (getting stuff done)

# OO v SOA

- NERC Vocabulary Server
- OO View
  - REST calls, returning XML representing terms
- Service View
  - Governance
  - Authoritativeness
  - Provenance
  - Mapping

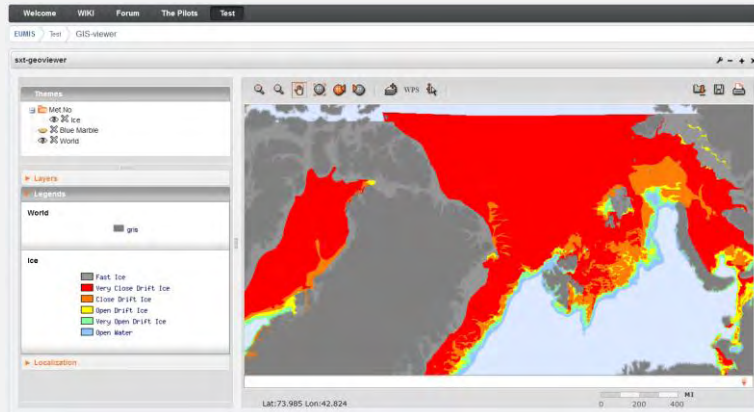
# Composite Front End (Portal)

How do you we interact with multiple services, get an integrated, cohesive user interface and still preserve SOA principles and modularity benefits? *Rotem-Gal-Oz - SOA Patterns*

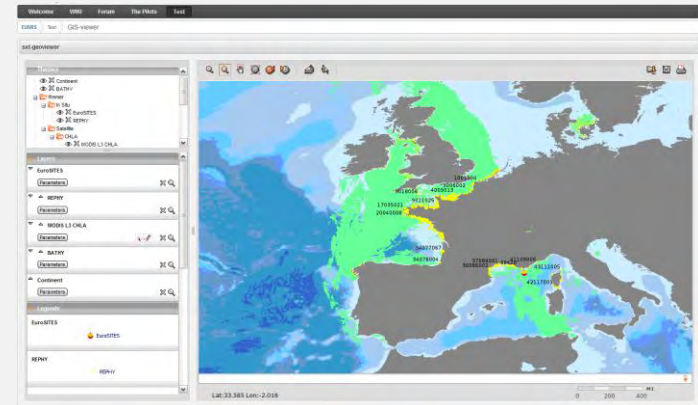


# Multiple User Domains

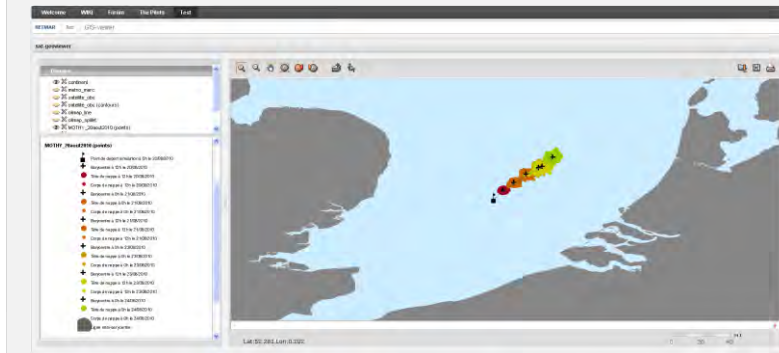
## Ice pilots



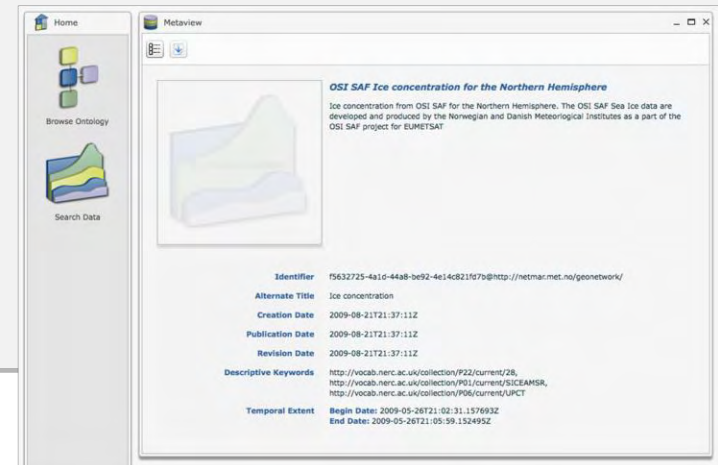
## Oil slick monitoring



## Oceanography

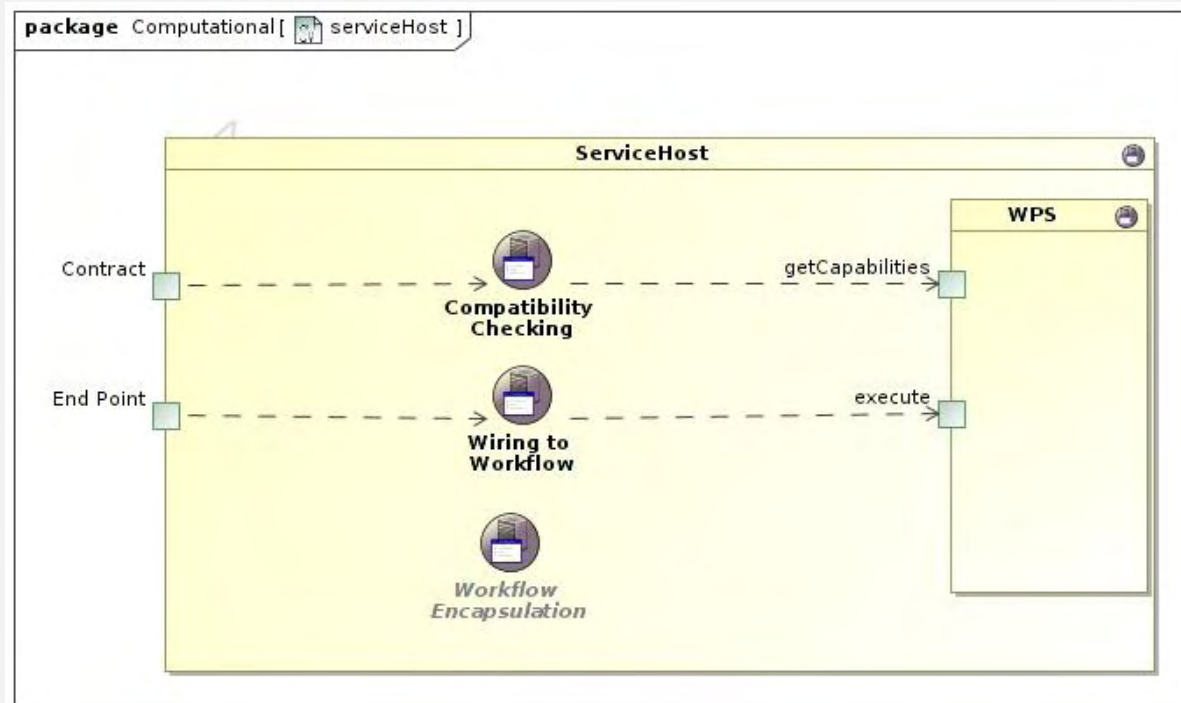


## Coastal Atlas



# Service Host

There needs to be a way to easily configure services, and avoid duplicating the effort of mundane tasks such as setting listeners, and wiring components, for each service.



# Multiple Disciplines

- Geographical / Earth Sciences
  - WPS, Grass GIS modules
- Biological
  - Taverna, MyExperiment

# PBAR

- Patterns Based Architecture Reviews
  - Harrison, Avgeriou, *IEEE Software*
- Focused stakeholder conversation
- Agile approach to architecture
- Checklist based on ATAM General Scenarios
  - Software Engineering Institute

# Conclusion

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- Architecture guides conversation
- Emphasise added value over interfaces
- Concrete guidance
- Agile architecture
- Bridge between IT and domain experts



# Thank you, any questions?

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