PML | Plymouth Marine Laboratory

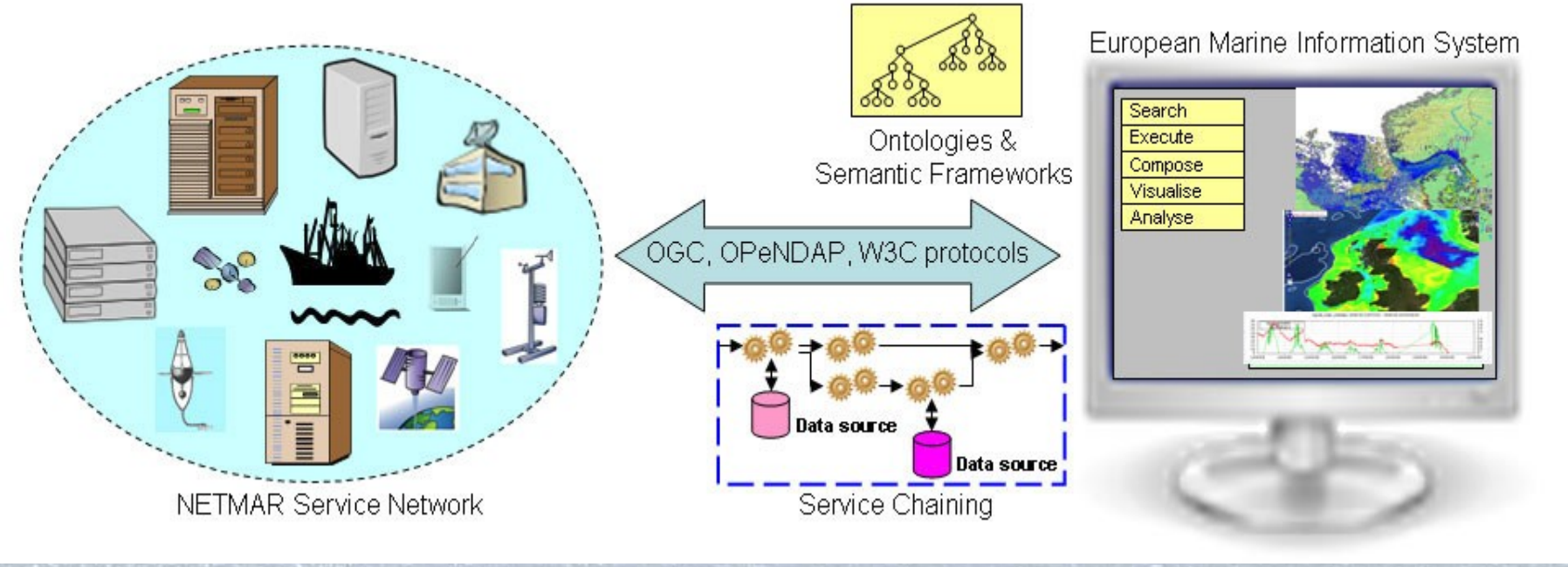
Open Service Network for Marine Environmental Data

Jorge de Jesus

GeoViQua Workshop,Barcelona

18/Fev/2011

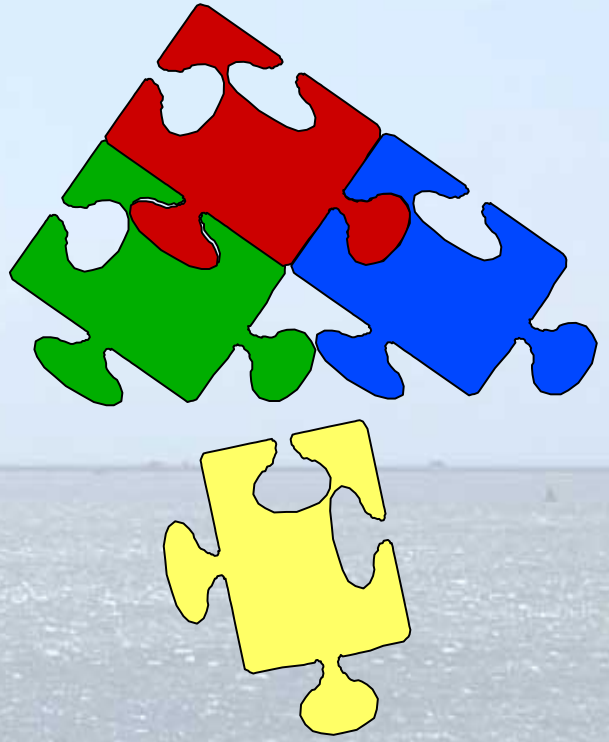
Introduction



Development of a pilot European Marine Information System (EUMIS)

Download satellite data, integrating data, model comparison

Why ?



High volumes of data:

- -Satellite and aircraft image
- -Human observations, vessels
- -In situ measurements (buoys, vessels)
- -Weather Forecast
- -Ecosystem and drift models

Systems not fully interoperable

Inefficient data usage, transformation, process

How ?

Flexible service discovery, access and chaining

OGC, OpeNDAP and W3C standards

Use of semantic frameworks and ontologies

Complex products, statistical information

Strategy – User Cases

1. Arctic Sea Ice and Metocean Observing System

2. Near real time monitoring and forecasting of oil spils

3. Relationships between physical and biological variables

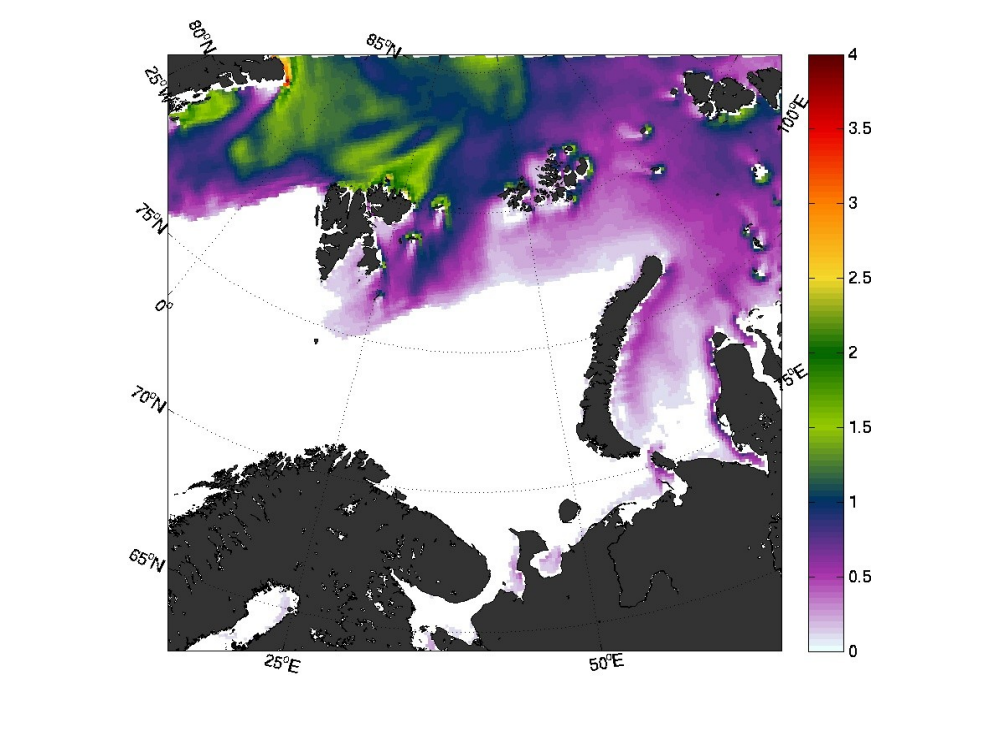
4.Ecosystem model validation

5. International Coastal Atlas Network (ICAN) for costal zone management

6. Phytoplankton blooms in Gulf of Biscay and English Channel

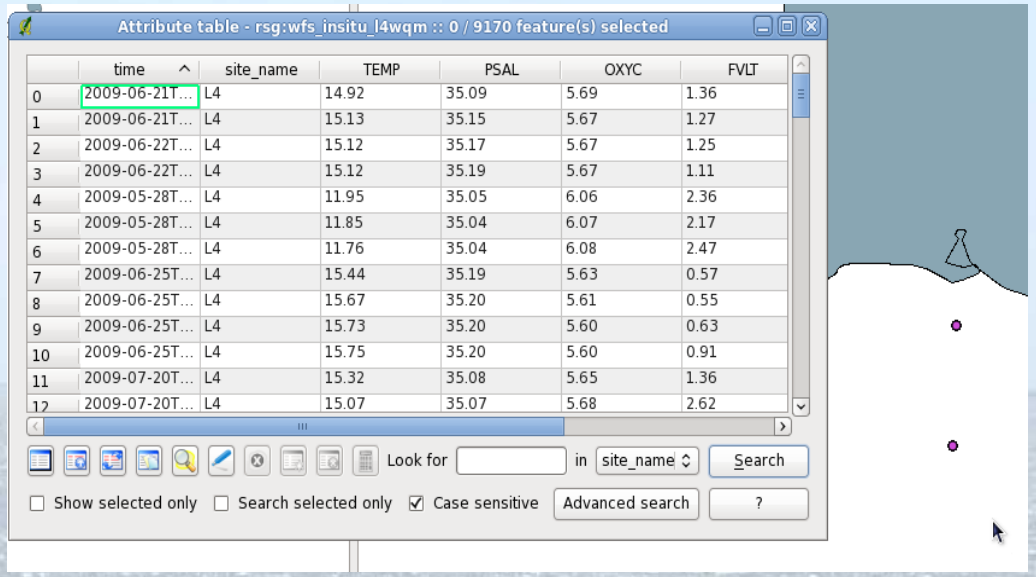
UC-1: Arctic Sea Ice

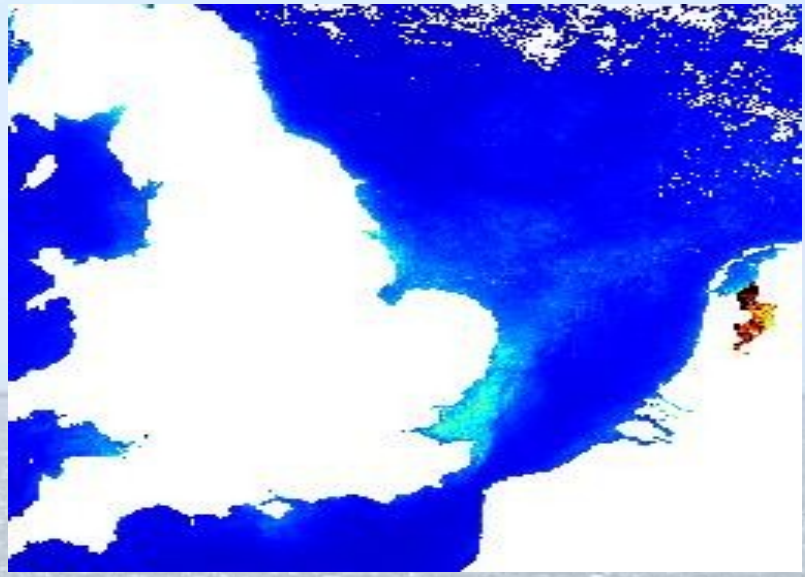
Sea Ice forecast, real time access to latest sea ice



Topaz model ice thickness 16 Dec-2010 (NERSC)

UC-3: Physical / Biological Variables





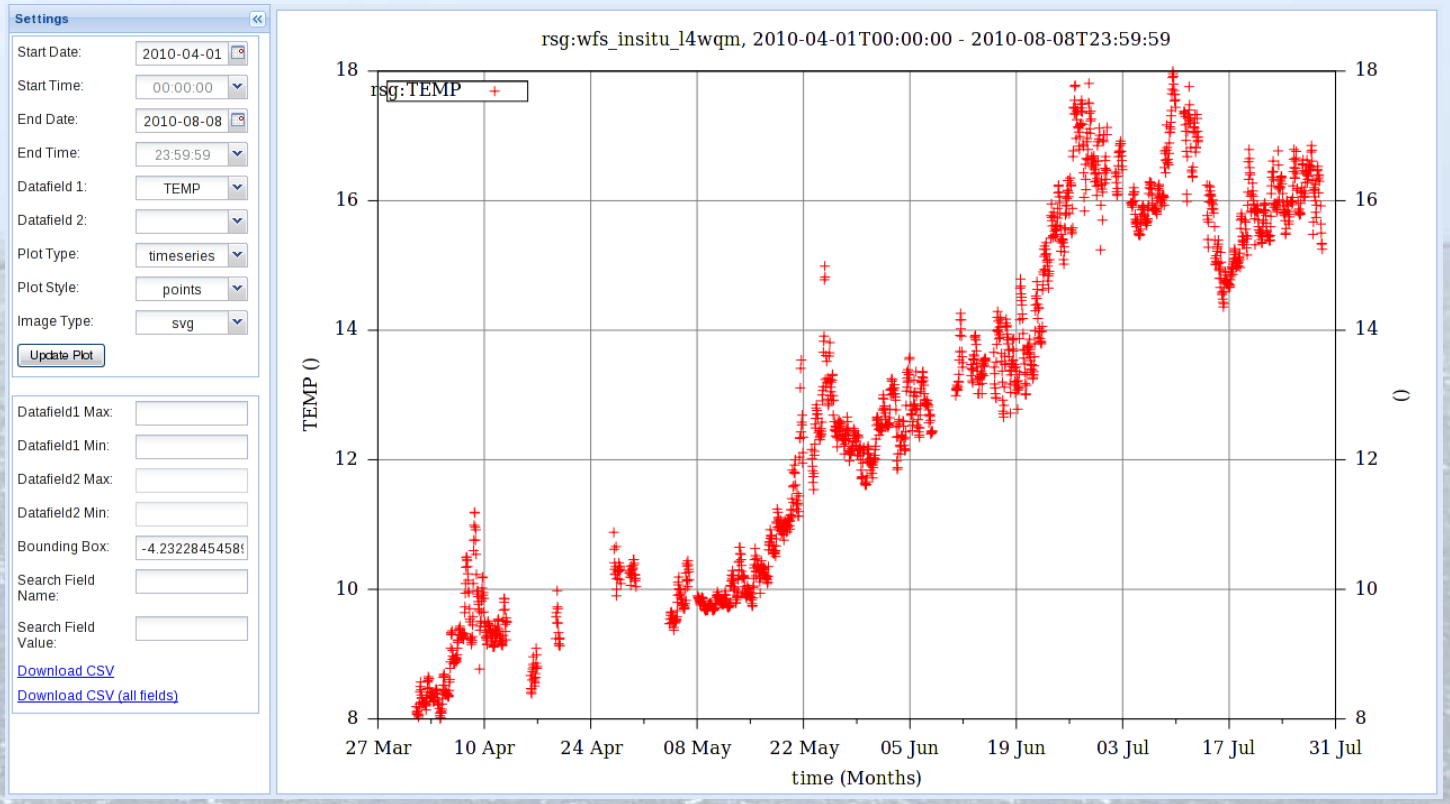
In situ WFS

MODIS scene - WMS/WCS

Comparison of long term chlorophyll measurements at the L4 station with satellite observations by MODIS and MERIS

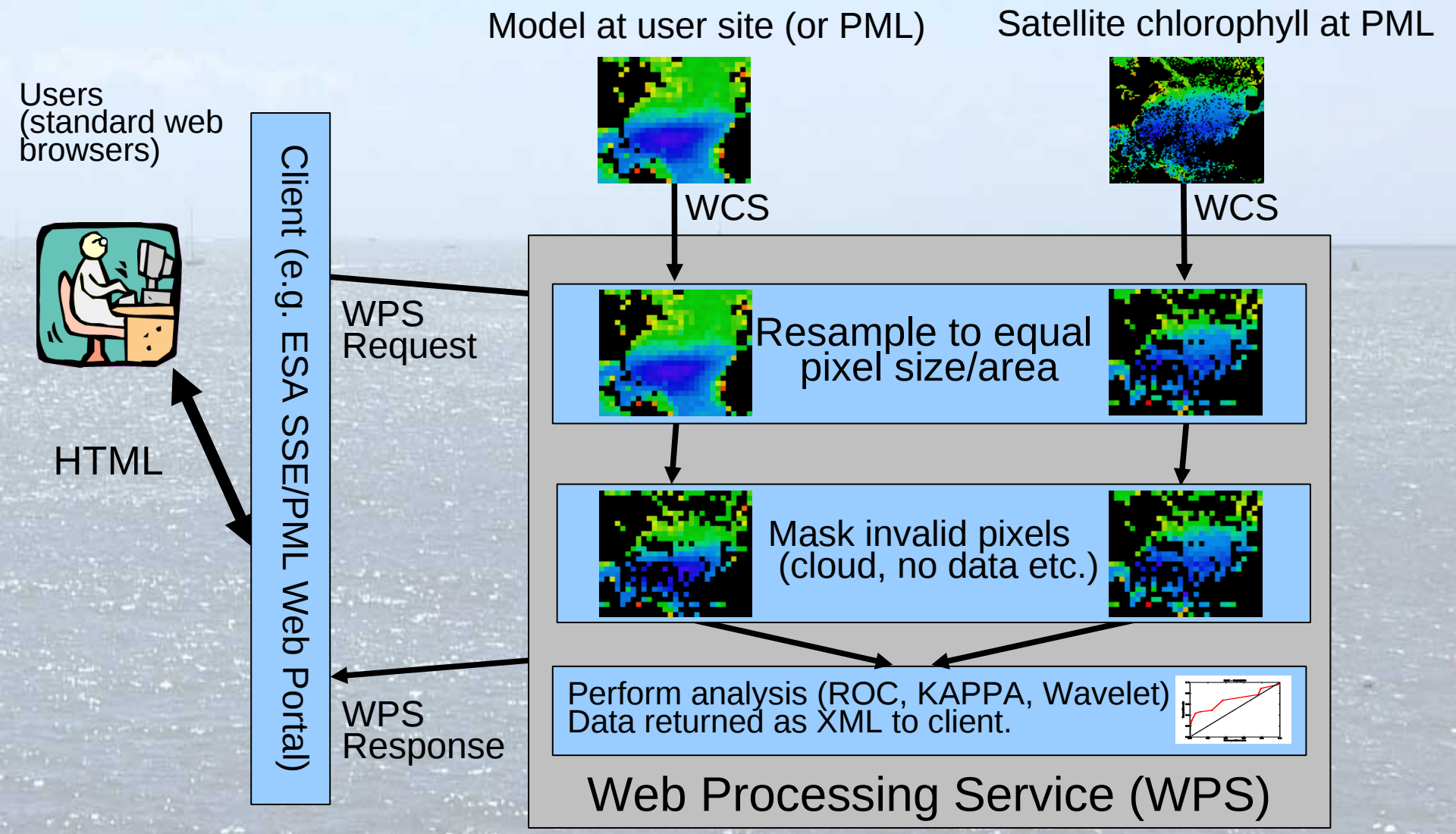
UC-3: Physical / Biological Variables

Time series and spatial comparisons



L4 In situ – Time series

UC-4: Satellite/Model comparison



Solutions:

Data Quality:

-Providing uncertainty when possible

-Consuming uncertainty when possible

Developers

Users

uncert | web

NETMAR

Solutions:

NetCDF file format using UncertML standard:

:netcdf_file_type = "NETCDF4_CLASSIC" ;

:Conventions = "CF-1.4" ;

:institution = "Plymouth Marine Laboratory Remote Sensing Group" ;
:history = "Created during RSG Standard Mapping (MODIS-AQUA-NASA-refined-mapper-config.cfg) [SGE Job Number: 3653900]" ;

:Conventions=”CF-1.4,UncertML”

Solutions:

NetCDF file format with uncertainty definition

```
variables:
        double Lon(Lon) ;
                Lon:units = "degreesE" ;
        double Lat(Lat) ;
                Lat:units = "degreesN" ;
        float temperature_Gaussian_Mean(Lat, Lon) ;
                temperature_Gaussian_Mean:units = "degC" ;
                temperature_Gaussian_Mean:missing_value = -999.f ;
                temperature_Gaussian_Mean:uncertML_ref =
"http://dictionary.uncertml.org/distributions/Gaussian/Mean" ;
```

Explanation of Uncertainty

Solutions:

NetCDF file format with uncertainty relations

variables:

float temperature_Gaussian_Mean(Lat, Lon) ;
....:ancillary_variables=”temperature_Gaussian Variance”

float temperature_Gaussian_Variance(Lat,Long)
temperature_Gaussian_Mean:uncertML_ref =”http://...Variance”

Use of ancillary_variables

Solutions:

Development of WPS that understand uncertainty

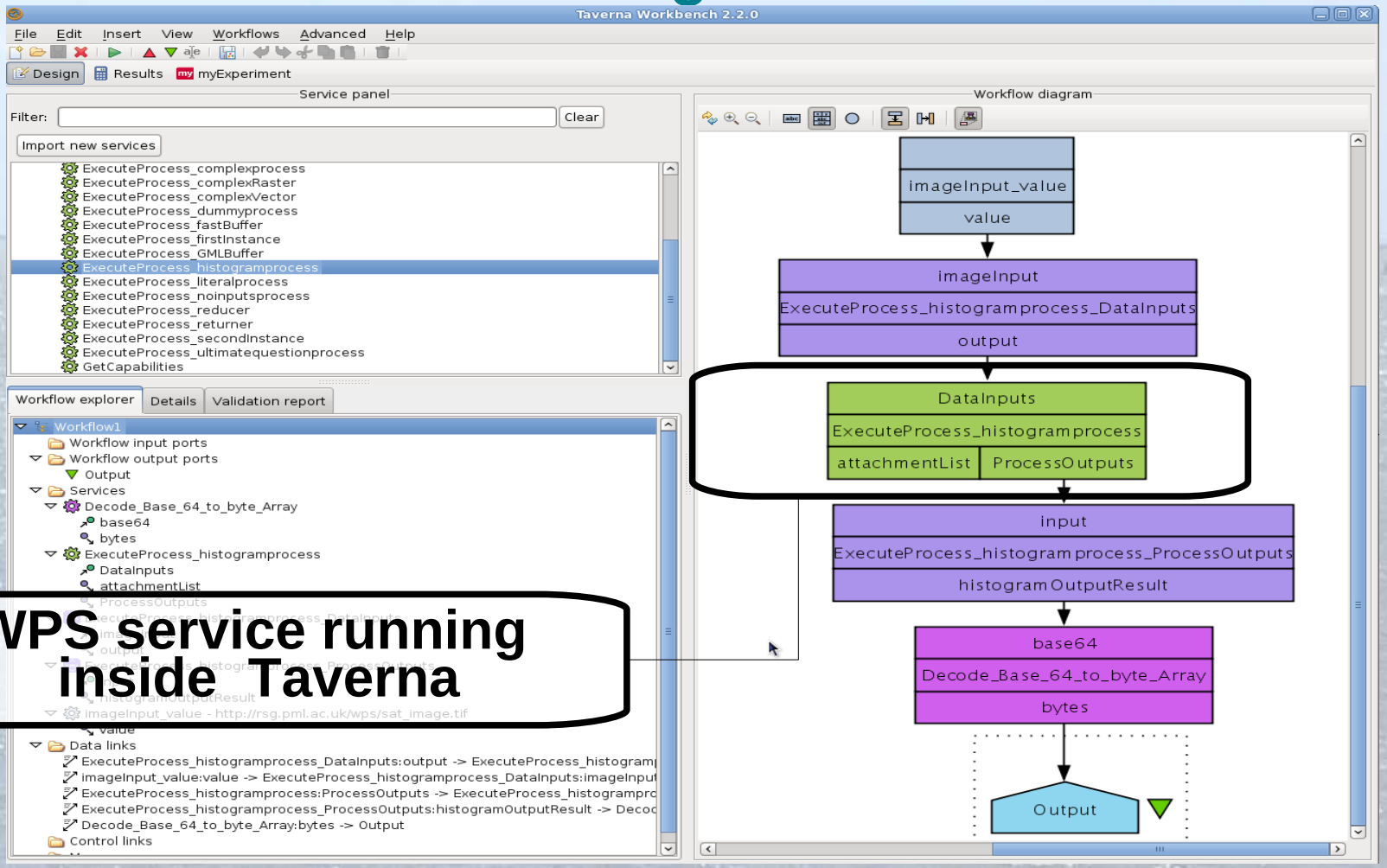
Should coexist with existing systems, without change

Wrapping existing analysis code as WPS

Use semantics to increase service description and functionality

Developments:

WPS orchestration using WSDL/SOAP



WPS service running inside Taverna

Developments:

- WPS / PyWPS wiki

http://wiki.rsg.pml.ac.uk/pywps/index.php/Main_Page

- Netmar portal

http://netmar.nersc.no

Acknowledgements :

GeoViQua project for workshop invitation

Thank you !!!!!!