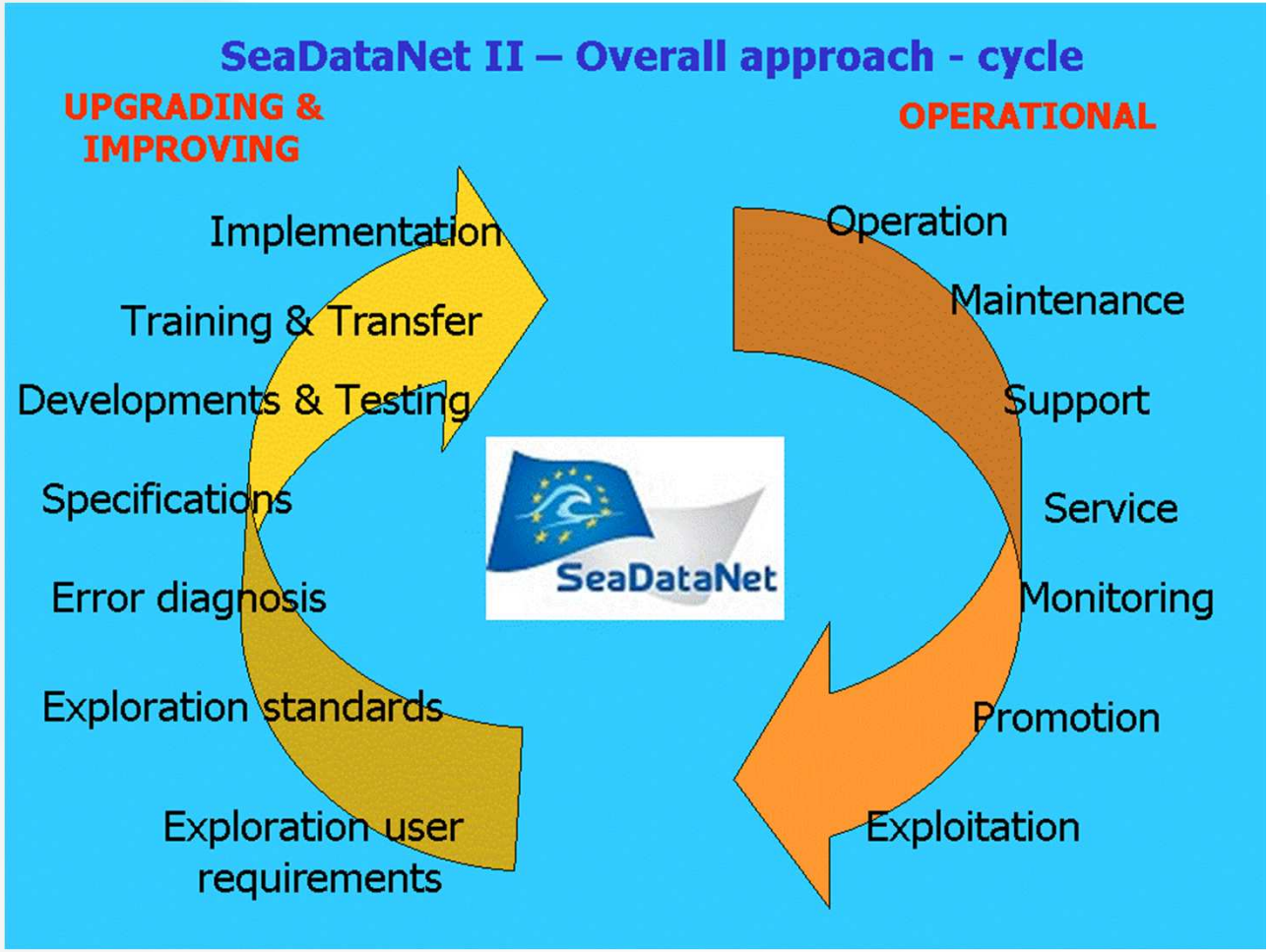
SeaDataNet

PAN-EUROPEAN INFRASTRUCTURE
FOR OCEAN & MARINE DATA
MANAGEMENT

WP8 – WP9 Technical developments – status

17 September 2015

By Dick M.A. Schaap – Technical Coordinator


SeaDataNet II – Overall approach - cycle
UPGRADING & IMPROVING
OPERATIONAL
Implementation
Training & Transfer
Developments & Testing
Specifications
Error diagnosis
Exploration standards
Exploration user requirements
Operation
Maintenance
Support
Service
Monitoring
Promotion
Exploitation
SeaDataNet

WP8 – standards: objectives

- Extending and finetuning the SeaDataNet standards for handling all types of marine and ocean data, in real-time and delayed mode, achieving interoperability and exchange with other relevant data management systems in Europe, and tuning with international standards

- Achieving INSPIRE compliance and contributing to the INSPIRE process for developing implementing rules for oceanography

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PAN-EUROPEAN INFRASTRUCTURE FOR OCEAN & MARINE DATA MANAGEMENT

Deliverable: D8.1 = DONE

CDI profile extended with extra attributes to support linked data concept

CDI and CSR XML encoding adapted to ISO-19139 and using NV2.0 Vocabularies

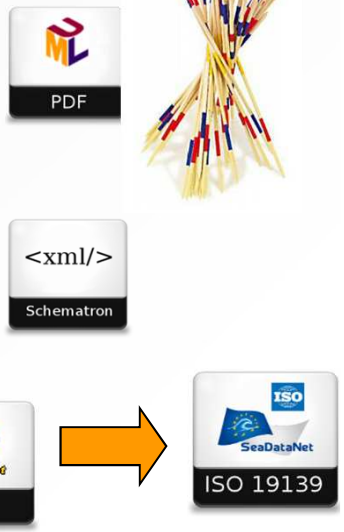
EDMED, EDMERP, and EDIOS XML migrated to using NVS2.0

Abstract metadata model specification

- ✓ SeaDataNet metadata profile of ISO 19115 documentation

XML encoding implementation:

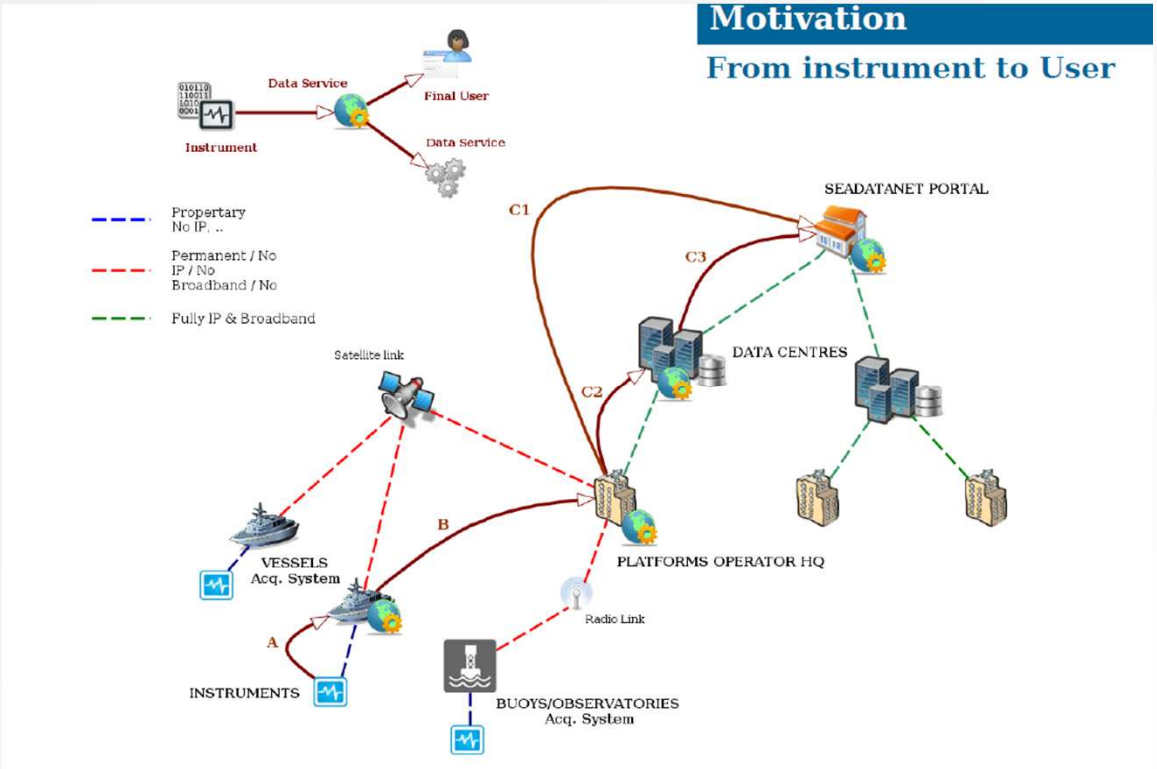
- ✓ Schema definition
- ✓ Schematron rules
- ✓ Sample metadata
- ✓ XML implementation documentation



www.seadatanet.org/Standards-Software/Metadata-formats

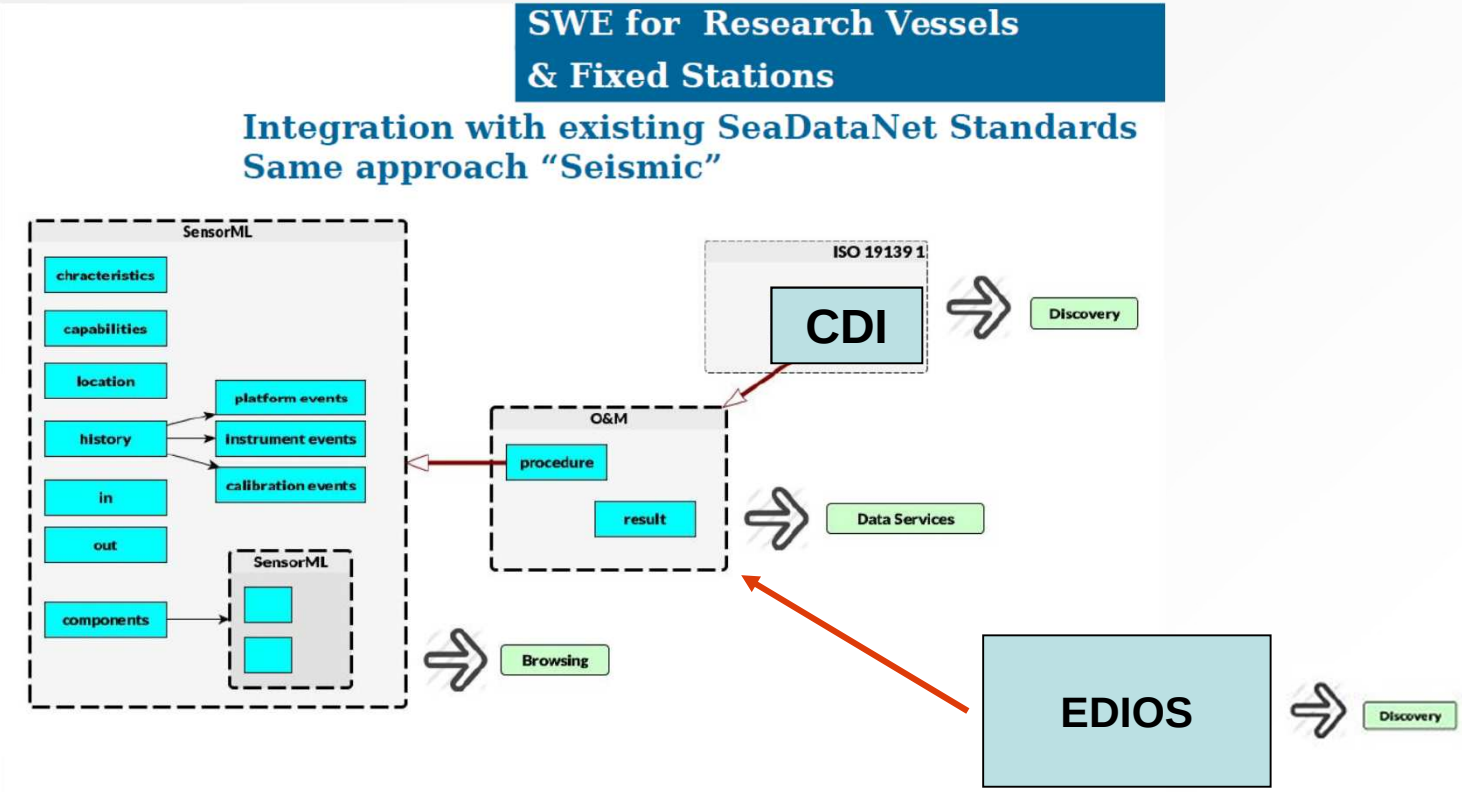
sdn-userdesk@seadatanet.org – www.seadatanet.org

- **Sensor Web Enablement (SWE)**
- To define extended metadata formats to support operational oceanography and other specific applications, from fixed stations and research vessels to data centres to users



Deliverable: D8.2 and D8.3 = DONE

SensorML and Observation & Measurements (O&M) profiles for selected instruments and concept for integrating SOS services in SeaDataNet

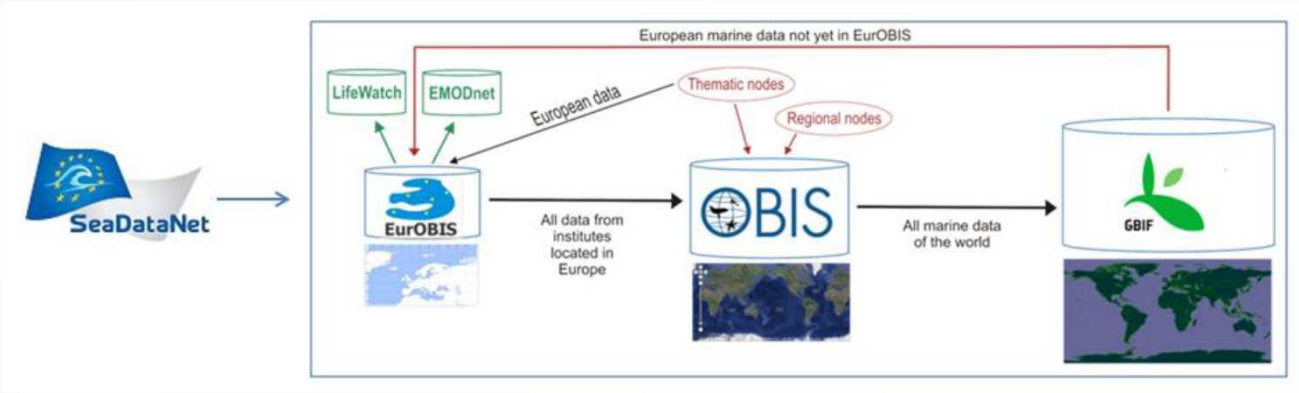


SeaDataNet

Deliverable: D8.4 = DONE

Analysis report for handling the discovery of, and access to marine biological data:

- CDI is fit for purpose
- Extensions for Vocabularies were required
- Adaptations of the SeaDataNet ODV ASCII format



- to make SeaDataNet better fit for handling marine biological data sets and establishing interoperability with biology data infrastructure initiatives.

Deliverable: D8.5 = DONE

Formulation of SeaDataNet NetCDF (CF) format next to the existing SeaDataNet ODV ASCII format (CFPOINT)

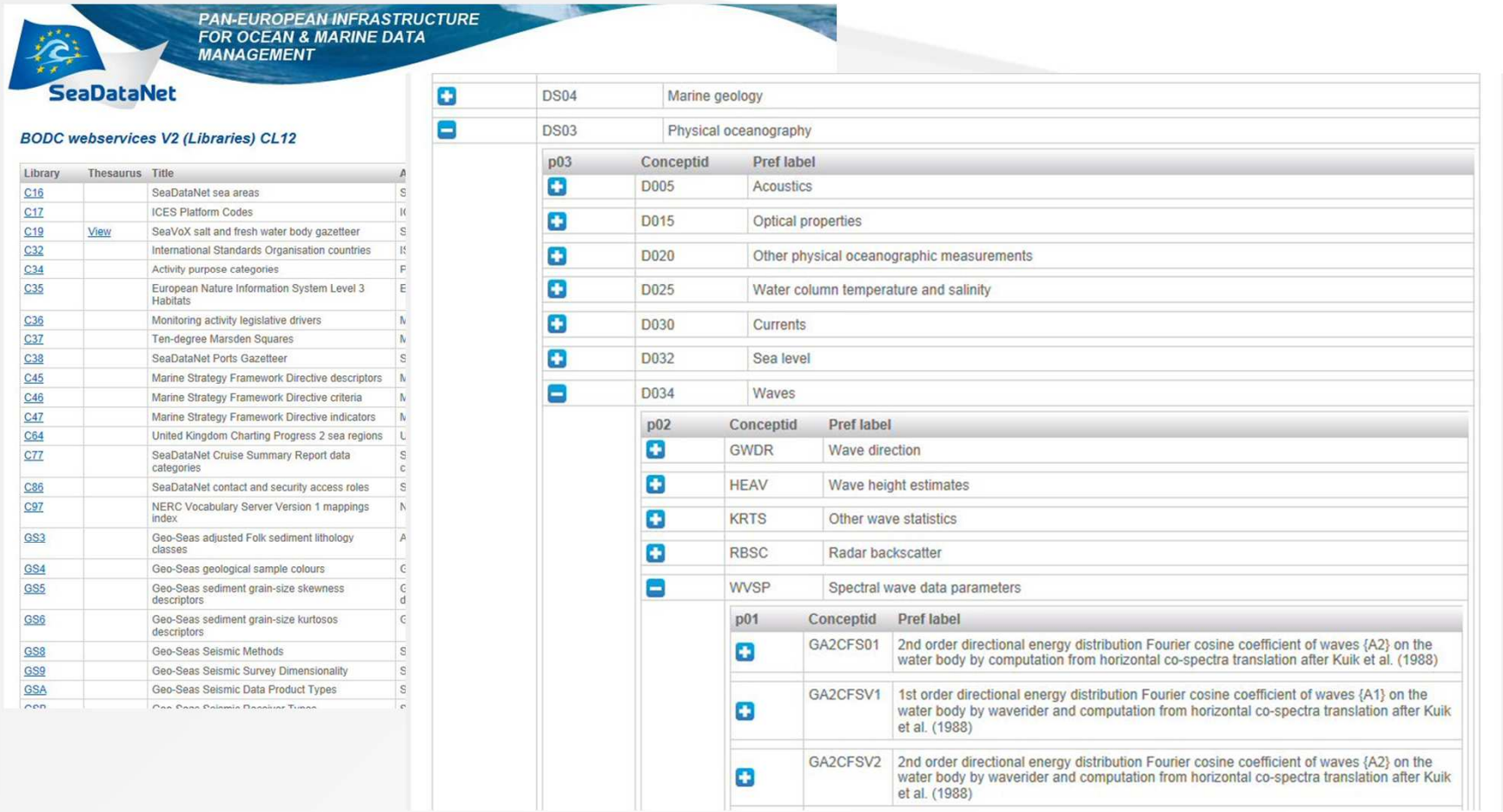
- Fit for profiles, trajectories and time series
- Following CF 1.6 specification
- Formulated together with an international community of NetCDF experts
- Software tools adapted (**MedSDN2CFPOINT, OdvSDN2CFPOINT, DM)**

Deliverable: D8.6 = DONE

Upgrading of SeaDataNet Common Vocabularies to NVS2.0 and regular maintenance

- Migration to SKOS
- Provision for mappings to external resources
- Available by web services and amended User Interface
- Governance by international SeaVox board

SeaDataNet Common Vocabularies



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SeaDataNet

BODC webservices V2 (Libraries) CL12

Library	Thesaurus	Title
C16		SeaDataNet sea areas
C17		ICES Platform Codes
C19	View	SeaVoX salt and fresh water body gazetteer
C32		International Standards Organisation countries
C34		Activity purpose categories
C35		European Nature Information System Level 3 Habitats
C36		Monitoring activity legislative drivers
C37		Ten-degree Marsden Squares
C38		SeaDataNet Ports Gazetteer
C45		Marine Strategy Framework Directive descriptors
C46		Marine Strategy Framework Directive criteria
C47		Marine Strategy Framework Directive indicators
C64		United Kingdom Charting Progress 2 sea regions
C77		SeaDataNet Cruise Summary Report data categories
C86		SeaDataNet contact and security access roles
C97		NERC Vocabulary Server Version 1 mappings index
GS3		Geo-Seas adjusted Folk sediment lithology classes
GS4		Geo-Seas geological sample colours
GS5		Geo-Seas sediment grain-size skewness descriptors
GS6		Geo-Seas sediment grain-size kurtosos descriptors
GS8		Geo-Seas Seismic Methods
GS9		Geo-Seas Seismic Survey Dimensionality
GSA		Geo-Seas Seismic Data Product Types

DS04	Marine geology
DS03	Physical oceanography

p03	Conceptid	Pref label
	D005	Acoustics
	D015	Optical properties
	D020	Other physical oceanographic measurements
	D025	Water column temperature and salinity
	D030	Currents
	D032	Sea level
	D034	Waves

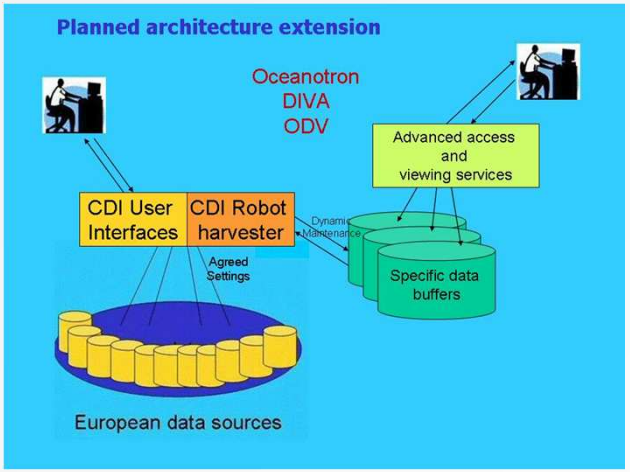
p02	Conceptid	Pref label
	GWDR	Wave direction
	HEAV	Wave height estimates
	KRTS	Other wave statistics
	RBSC	Radar backscatter
	WVSP	Spectral wave data parameters

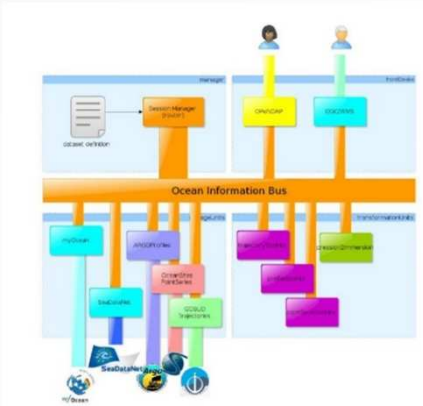
p01	Conceptid	Pref label
	GA2CFS01	2nd order directional energy distribution Fourier cosine coefficient of waves {A2} on the water body by computation from horizontal co-spectra translation after Kuik et al. (1988)
	GA2CFSV1	1st order directional energy distribution Fourier cosine coefficient of waves {A1} on the water body by waverider and computation from horizontal co-spectra translation after Kuik et al. (1988)
	GA2CFSV2	2nd order directional energy distribution Fourier cosine coefficient of waves {A2} on the water body by waverider and computation from horizontal co-spectra translation after Kuik et al. (1988)

Deliverable: D8.7 = DONE,

Analysis and formulation of new access and viewing services

- Enhancing the interoperability of the CDI service with: OGC CS-W, WMS – WFS and OpenSearch (***implemented***)
- New services directly on the buffers of harvested data sets, in combination with EMODnet Chemistry (***implemented***), and for publishing SeaDataNet T & S Climatology via Oceanotron (***well underway***)
- Note: implementation to be reported in **D9.4 and D5.5**





Oceanotron supporting interfaces
To WMS, SOS, and OPENDAP

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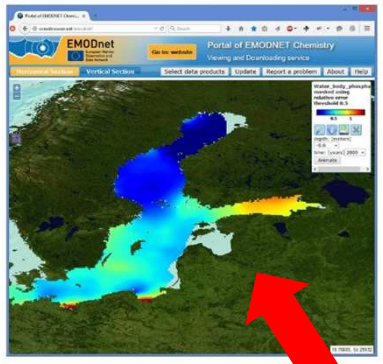
EMODnet Chemistry Products & Data viewing

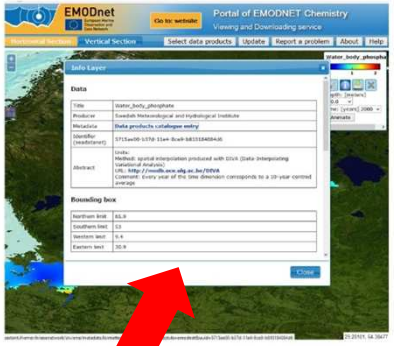
Horizontal section



The right panel controls the current layer:

- Select depth and time
- Plot style
- Metadata
- Download of data product

More information



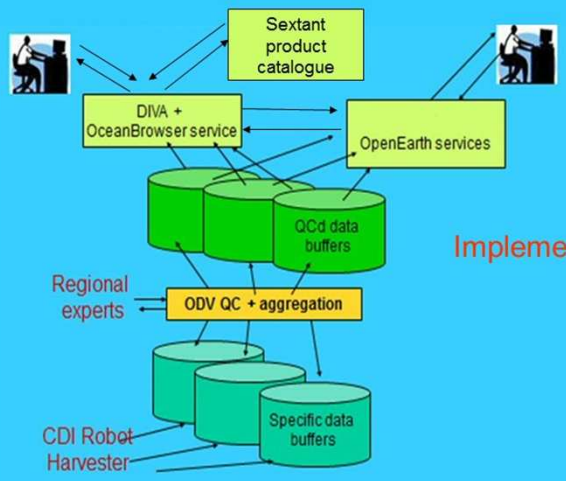
Info about the NetCDF file

- NetCDF Comments attribute
- Units
- Bounding box
- Time range
- Depth range
- Link to Sextant catalog from Ifremer

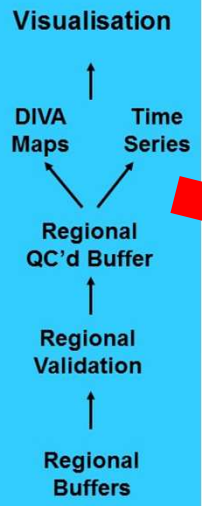
Spatial distribution by GeoServer layers in OceanBrowser

- Circles show data location (within depth and time range)
- Circle are semi-transparent (intensity of a color gives an indication of number of observation points)

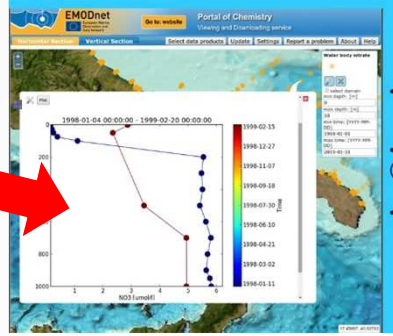
Workflow from data collections to products to viewing



Implemented



Plot of data at selected location as Profile



- One can switch between time series and profile view
- For profiles (x-axis: parameter and; y-axis: depth)
- Time is represented by color

sdn-userdesk@seadatanet.org – www.seadatanet.org

Deliverable: D8.8 = DONE

Method for checking of potential duplicates on CDI level defined

- Integrated into ODV software
- Tested with large SeaDataNet – MyOcean T&S data set (ca 860.000 data sets)
- Integrated into CDI import and validation process
- Improves the overall quality of the data sets managed within the SeaDataNet infrastructure of distributed data centres

Deliverable: D8.9 - DONE

SeaDataNet standards submitted to the JCOMM/ IODE Ocean Data Standards (ODS) process (together with ODIP)

- Vocabularies (**March 2015**), CDI and CSR Schema's (**November 2014**), SeaDataNet NetCDF format (**March 2015**)

WP9 – Development and governance of software tools, services and interoperability solutions

- To support improved and upgraded maintenance of the metadata directories
- To support robust access to a wider range of data types, including real-time from acquisition to data centre
- Interoperability solutions towards IODE Ocean Data Portal, GEOSS and others
- To upgrade the ODV analysis and visualisation software
- To upgrade the DIVA statistical analysis and interpolation software
- To upgrade the OceanBrowser visualisation services for data products

Deliverable: D9.1 continued = DONE

Upgraded MIKADO XML editor software (V3.3.4)

- Adapted for use of Vocabularies NVS2.0
- Adapted for ISO 19139 XML profiles of CDI and CSR
- Reads both old and new XML files converting it into new XML files

Upgraded NEMO software for conversion of ASCII files (V1.6.1)

- Output to SeaDataNet NetCDF included Adapted for use of Vocabularies NVS2.0

Upgraded Download Manager software for connecting data centres (V1.4.6)

- Several improvements and DM_Checker for checking coherence between CDIs, local coupling table and local data sets / queries
- NetCDF CFPOINT support

Deliverable: D9.1 = DONE

- New tools
  - Software for conversion of the SeaDataNet Medatlas format to the SeaDataNet NetCDF (CFPOINT) format : **MedSDN2CFPOINT**
  - Software for conversion of the SeaDataNet ODV format to the SeaDataNet NetCDF (CFPOINT) format : **OdvSDN2CFPOINT**
  - Software for converting ODV or MEDATLAS SeaDataNet files with references to NERC vocabulary server **version 1** (NVS V1) to ODV or MEDATLAS SeaDataNet files with references to NERC vocabulary server **version 2** (NVS V2.0): **Change_Vocab_V1toV2** .
- Upgraded tools:
  - **EndsandBends** software to generate spatial objects from raw navigation (ship routes) to be included in CDI records to describe the geometries of the observations
  - **Med2MedSDN** software reformats MEDATLAS file(s) without the SeaDataNet extensions to MEDATLAS file()s with SeaDataNet extensions

Deliverable: D9.2 (DONE) – pilots for harvesting CSR and CDI

Central CDI and CSR services upgraded for ISO19139 and NVS2.0; and equipped with CS-W for harvesting of new and updated XML entries from local data centres to central directories

- GeoNetwork adapted for supporting CDI and CSR ISO 19139 XML output from MIKADO for providing as OGC CS-W services
- **CSR** harvesting and ingestion operational at BSH and proven with selected data centres (IFREMER, ….)
- Guidelines for wider deployment available (***updating D4.5 needed - BSH***)
- **CDI** harvesting and ingestion, taking into account staging process and relational model CDI – Coupling Table – Local data => online CDI harvesting and ingestion CMS is operational at MARIS
- CDI harvesting and ingestion pilot underway with BSH, IFREMER and IEO (***Updating D5.3 needed – MARIS***)

Deliverable: D9.3 – DONE

Upgraded XML editor software with capabilities for O&M and Sensor ML profiles for Operational Oceanography support

- Possible **D9.3 update** by IFREMER and CSIC? To include:
- online Editor (SensorNanny) and Draw my observation system by IFREMER; editor by CSIC?

Deliverable: D9.4 – CDI Portal operational for OO (DONE)

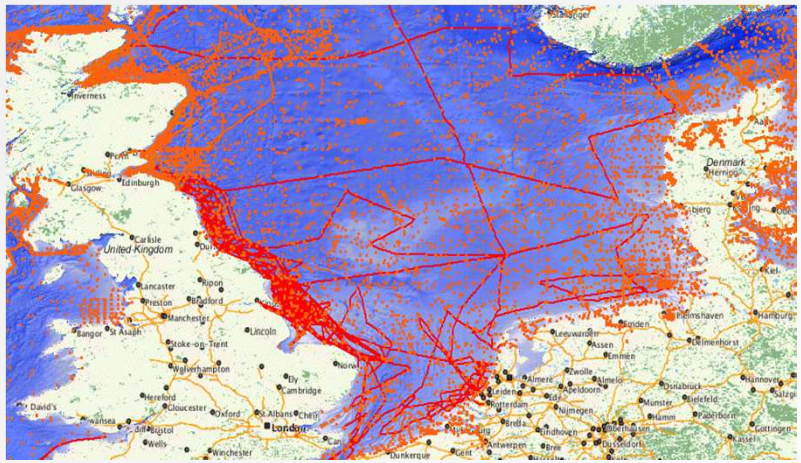
Upgraded Central CDI Data Discovery and Access service for demonstrating SOS services for Operational Oceanography and viewing services on data buffers

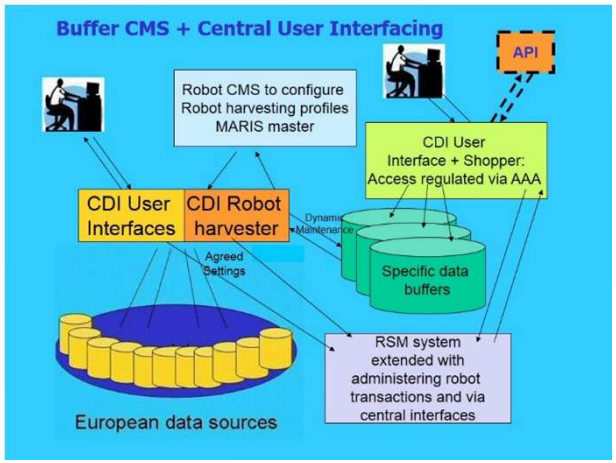
- Pilot underway with selected Oceanographic Platforms of IFREMER+ OGS, and other pilot with CSIC (/IEO) for SOS linked to CDI service
- **D9.4** (MARIS), **D5.4** (IFREMER) and **D5.5** (MARIS+IFREMER) need to be reported

Deliverable: D9.5 = DONE

Machine interfaces for CDI

- D8.7 services implemented
- CDI OGC CS-W service
- CDI OGC WMS – WFS services
- CDI OpenSearch service
- CDI Harvesting and Buffer system, incl API

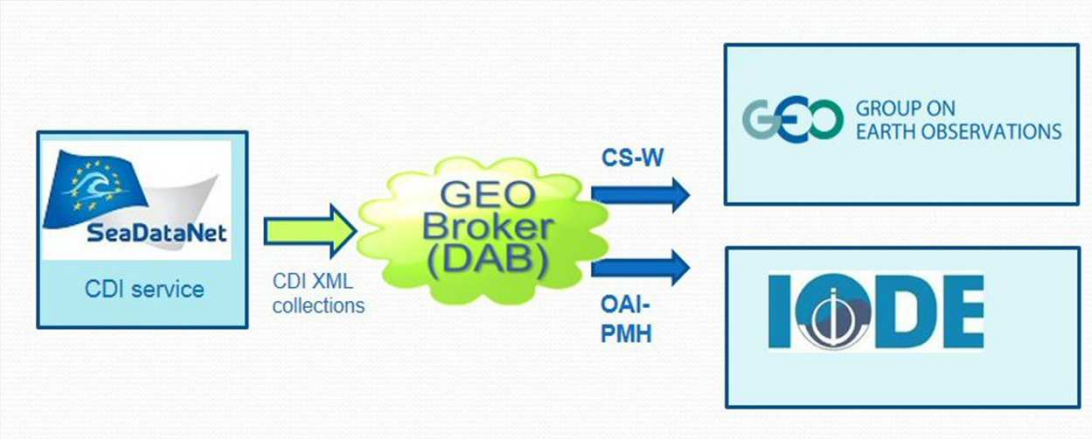


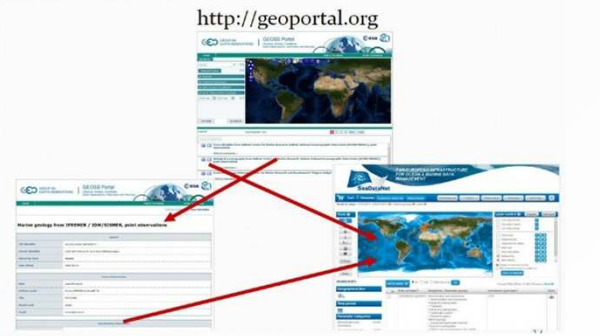


SeaDataNet

Deliverable: D9.6 = DONE

Interoperability solutions with global portals, such as IOC-IODE Ocean Data Portal (ODP) and GEOSS established

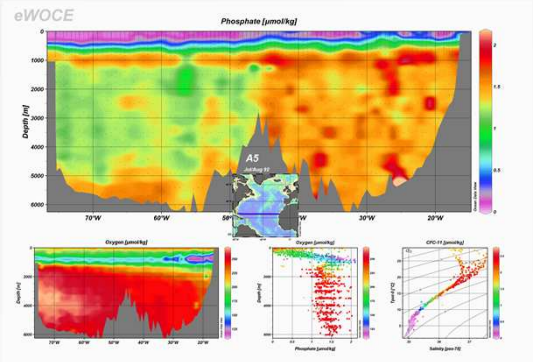


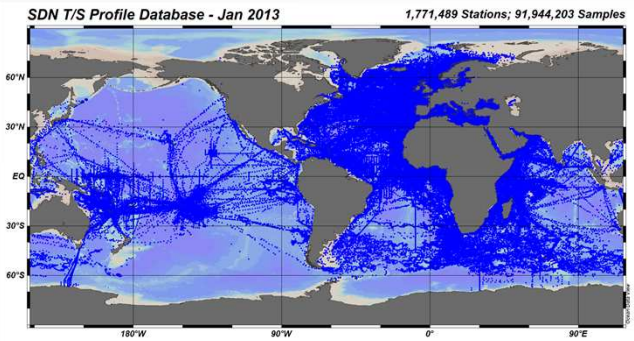


Deliverables: D9.7, D9.8, …. - DONE

Updated versions of the Ocean Data View (ODV) software

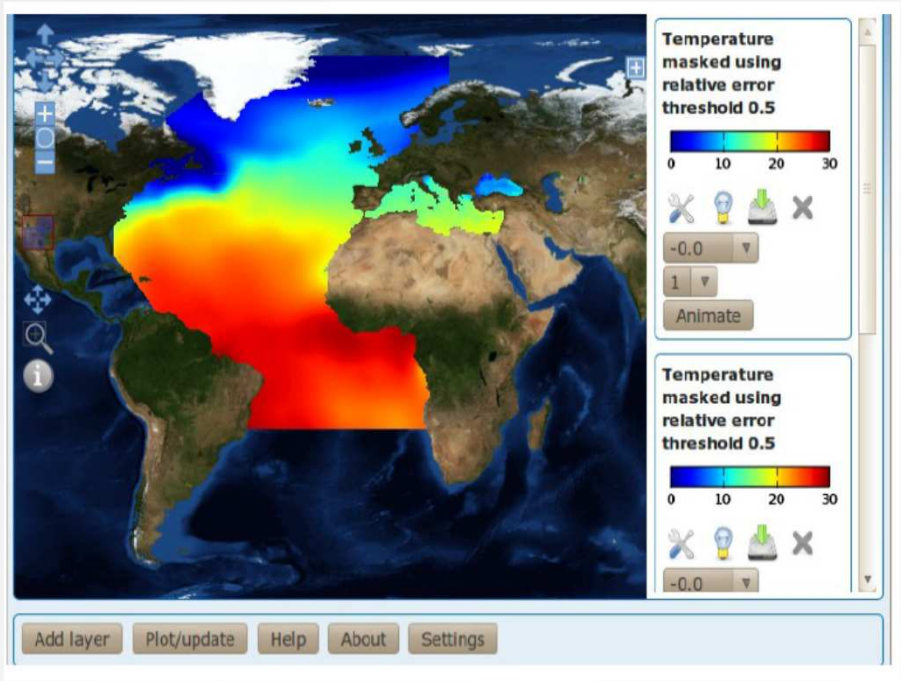
- support for “non-numeric” biological variables, bio model, remote netCDF access and a number of other major improvements and fixes
- ODV Application Programming Interface (API) plug-in, giving users full access to the data in an ODV data collection and allowing development of procedures for all kinds of data processing
- ODV API as C++ library and in Java language
- V4.6.4: significant improvements of the SDN file aggregator, duplicates checker, data quality checking facilities as well as message loggers .

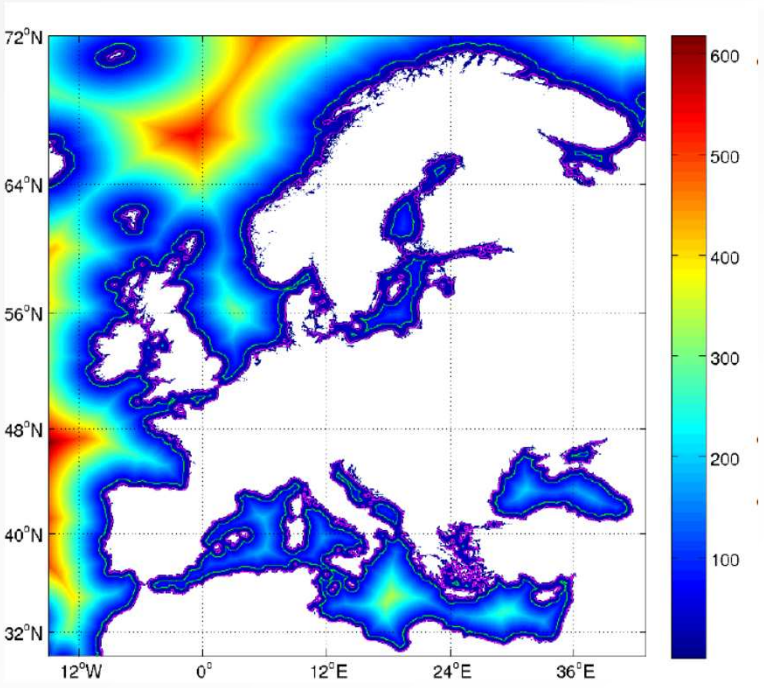




Deliverables: D9.9, D9.10, D9.11, D9.12,…. DONE

Updated versions of the Data Interpolating Variational Analysis (DIVA) software and OceanBrowser





Conclusions

- WP8 and WP9 almost complete
- All new formats and software products are fully documented and available from the public SeaDataNet portal
- Finalisation required for:
  - SWE pilots for Operational Oceanography via CDI – SOS – **D5.4** (IFREMER + CSIC) and **D9.4** (MARIS)
  - Possibly update of **D9.3 (**SWE editor**)** (IFREMER + CSIC)
  - Visualisation services via Oceanotron on T&S Climatology – include **in D5.5** (IFREMER)
  - CDI and CSR harvesting and ingestion pilots – to report in **updated D4.5** (CSR) (BSH) and **updated D5.3** (CDI) (MARIS)