PAN-EUROPEAN INFRASTRUCTURE
FOR OCEAN & MARINE DATA
MANAGEMENT

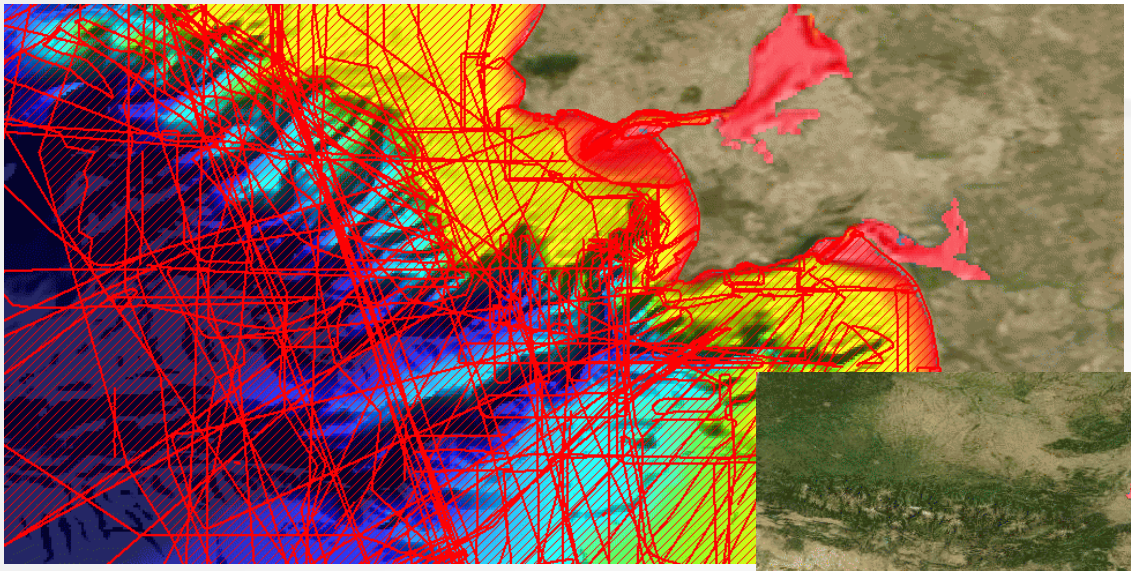
SeaDataNet

CDI Data Discovery and Access service – statistics and interoperability

SeaDataNet Plenary Meeting 23 September 2014

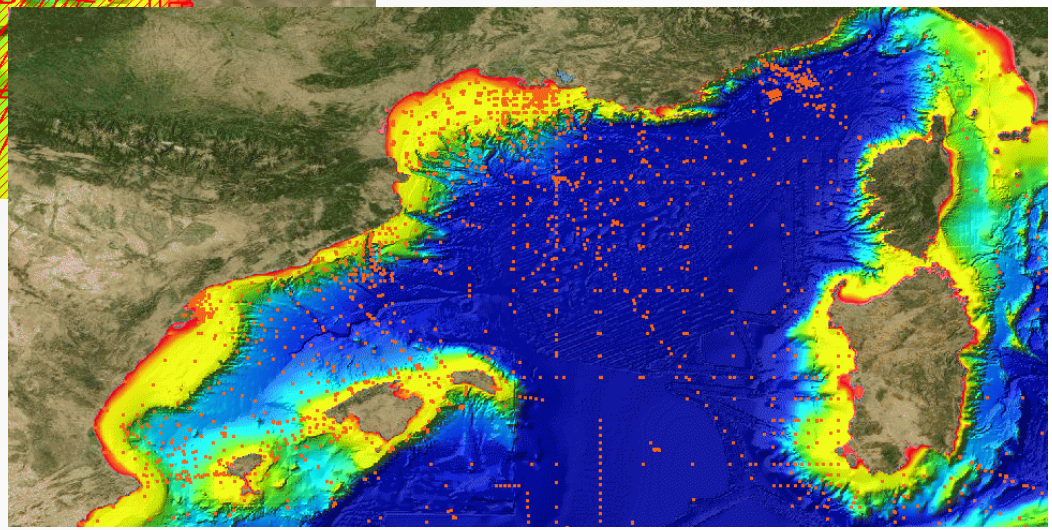
D.M.A. Schaap - Technical Coordinator

Examples of CDI search dialogue



Bathymetric surveys near Lisbon Portugal

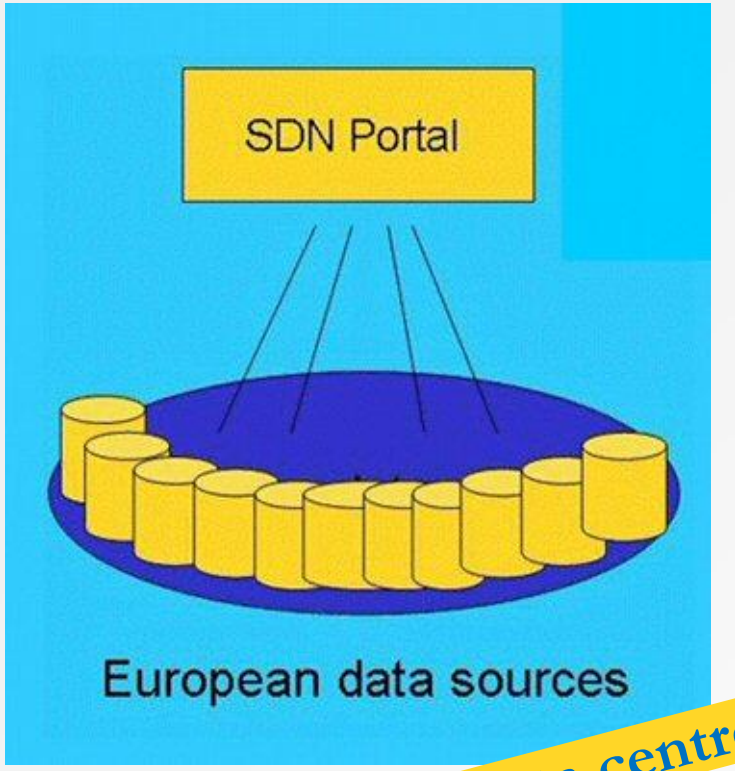
CDI Result Maps

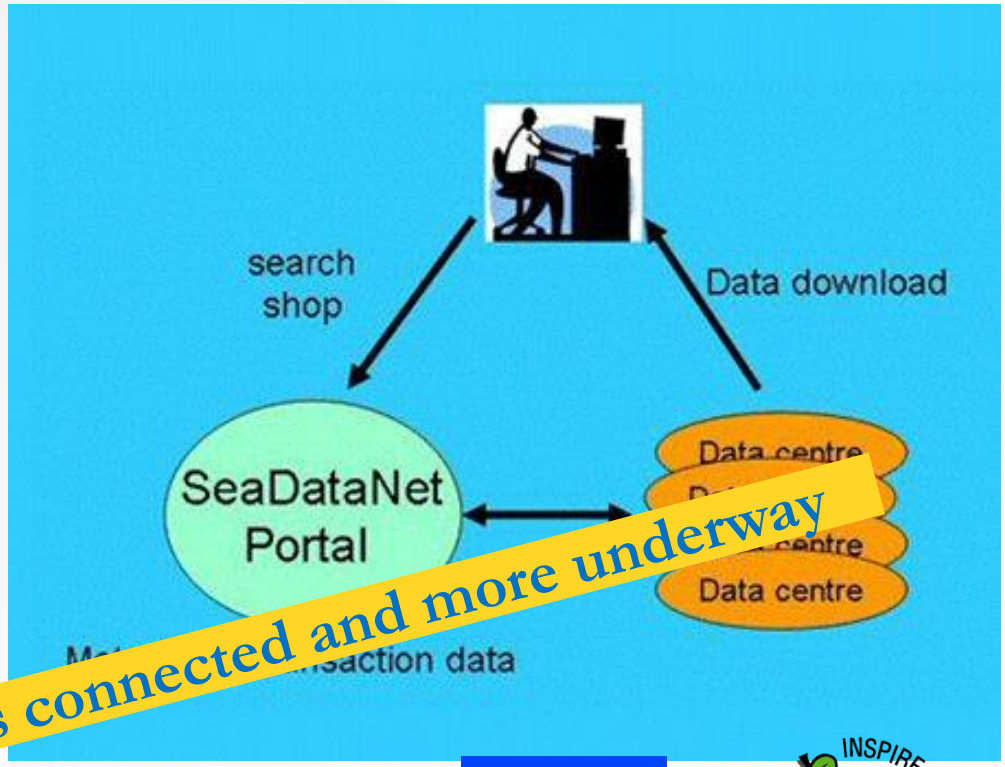


Nutrients data sets
in West Med

Result maps with EMODNet Bathymetry WMS in background

CDI service for discovery and unified access of data





Already 100 data centres connected and more underway

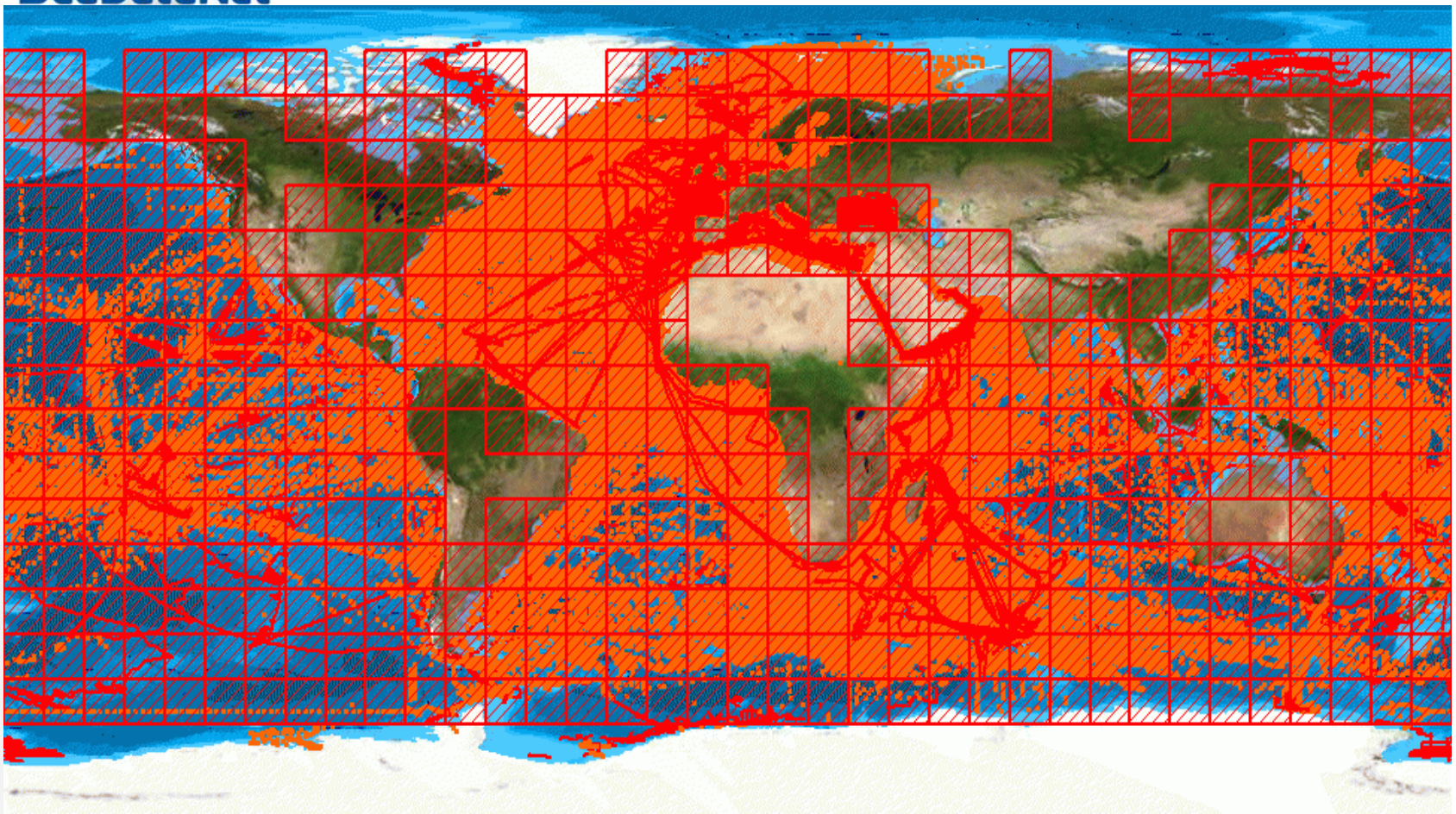
OGC

ISO

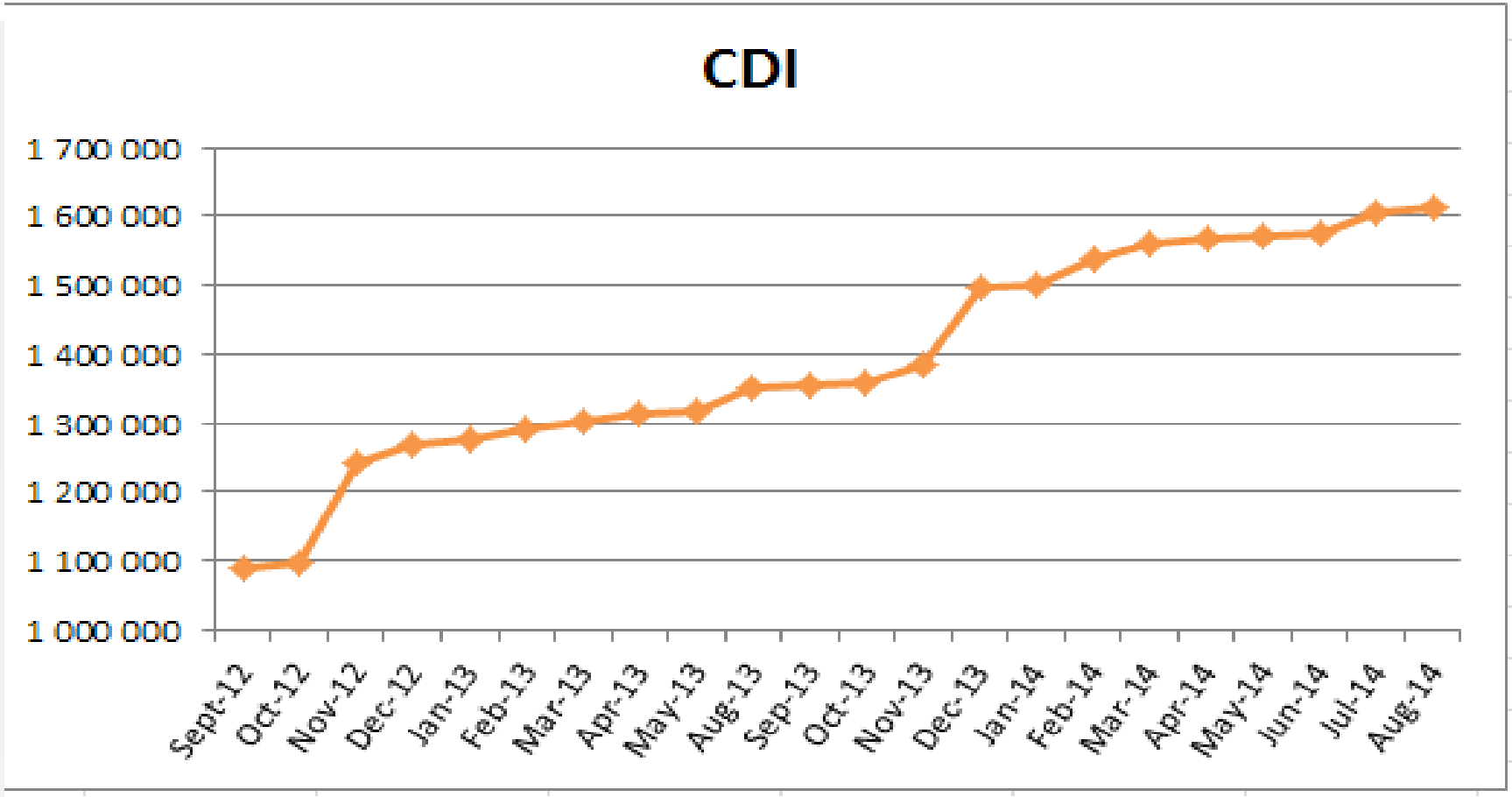
INSPIRE - Infrastructure for Spatial Information in Europe

PAN-EUROPEAN INFRASTRUCTURE
FOR OCEAN & MARINE DATA
MANAGEMENT

SeaDataNet



Coverage September 2014: **> 1,61 million** CDI entries from data centres in **34** countries and **509** originators for physics, chemistry, geology, geophysics, bathymetry and biology; years **1800 – 2014**; **84%** unrestricted or under SeaDataNet licence



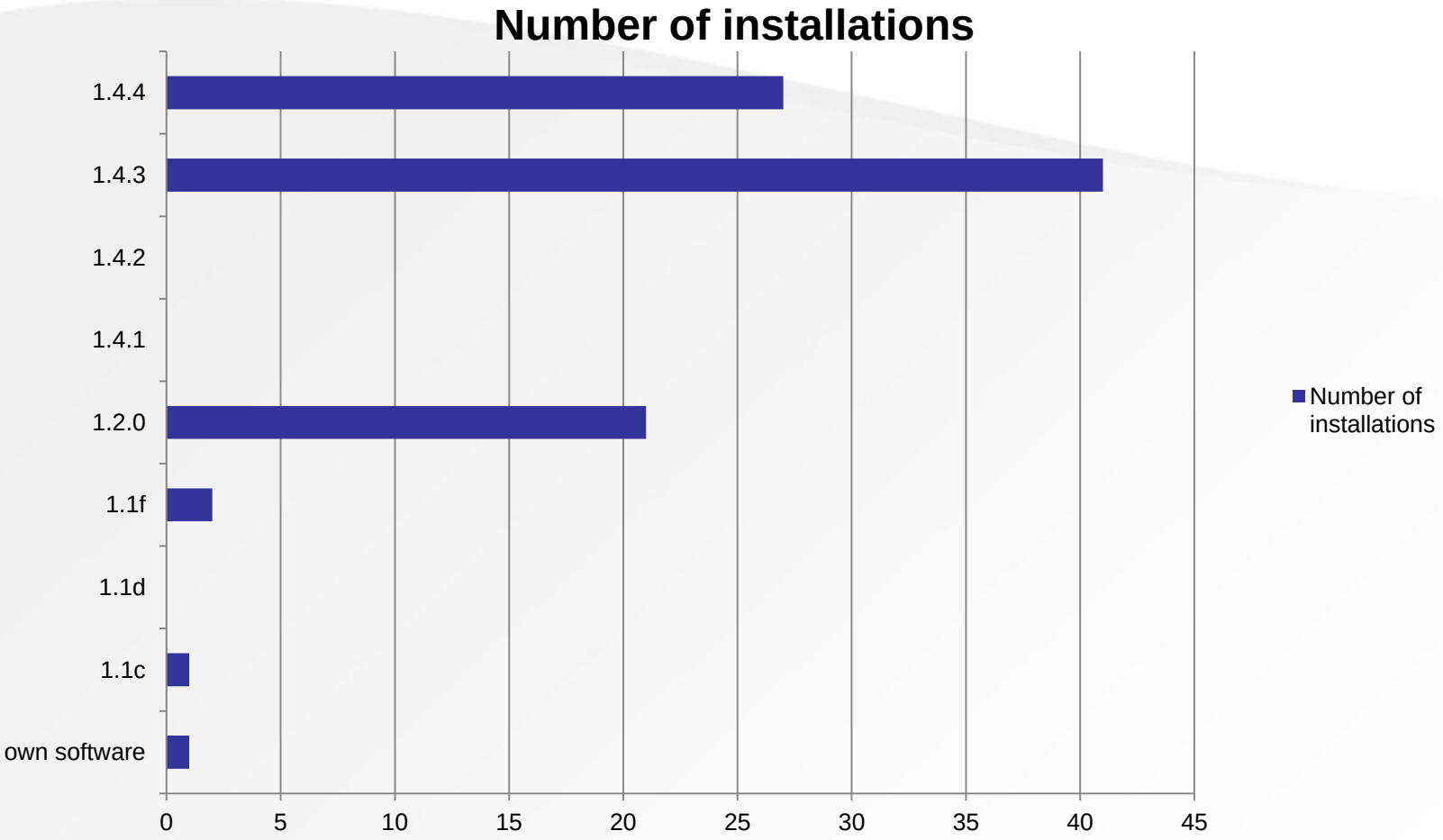
Increase of CDI since September 2012

SeaDataNet

PAN-EUROPEAN INFRASTRUCTURE
FOR OCEAN & MARINE DATA
MANAGEMENT

21 September 2014: **100** data centres connected and **5** data Centres in test for moving into operation soon => **105 data Centres;**

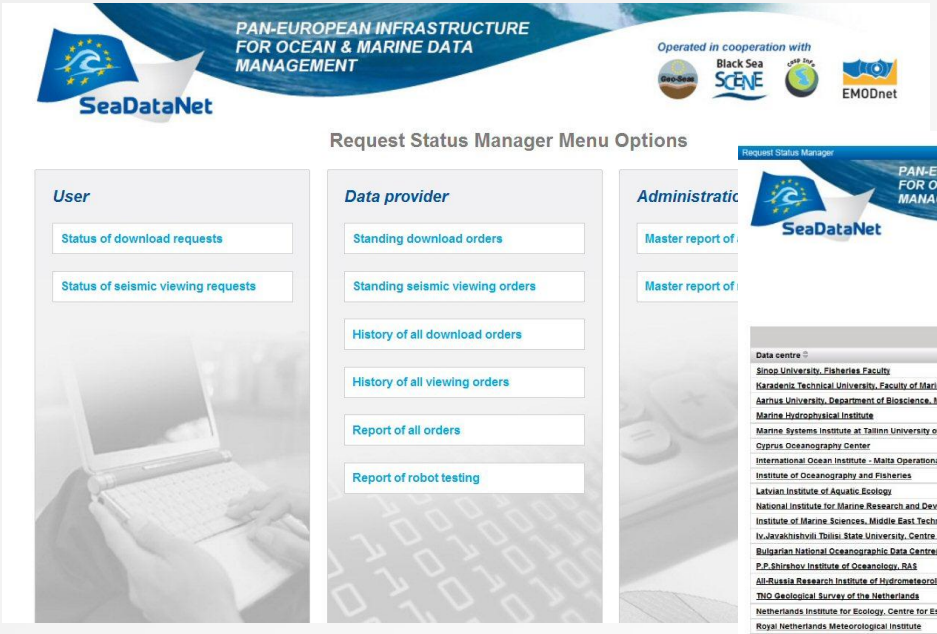
Situation with DM installations



All data centres should upgrade to adopt new functionalities and to make the SeaDataNet CDI service more robust and homogeneous

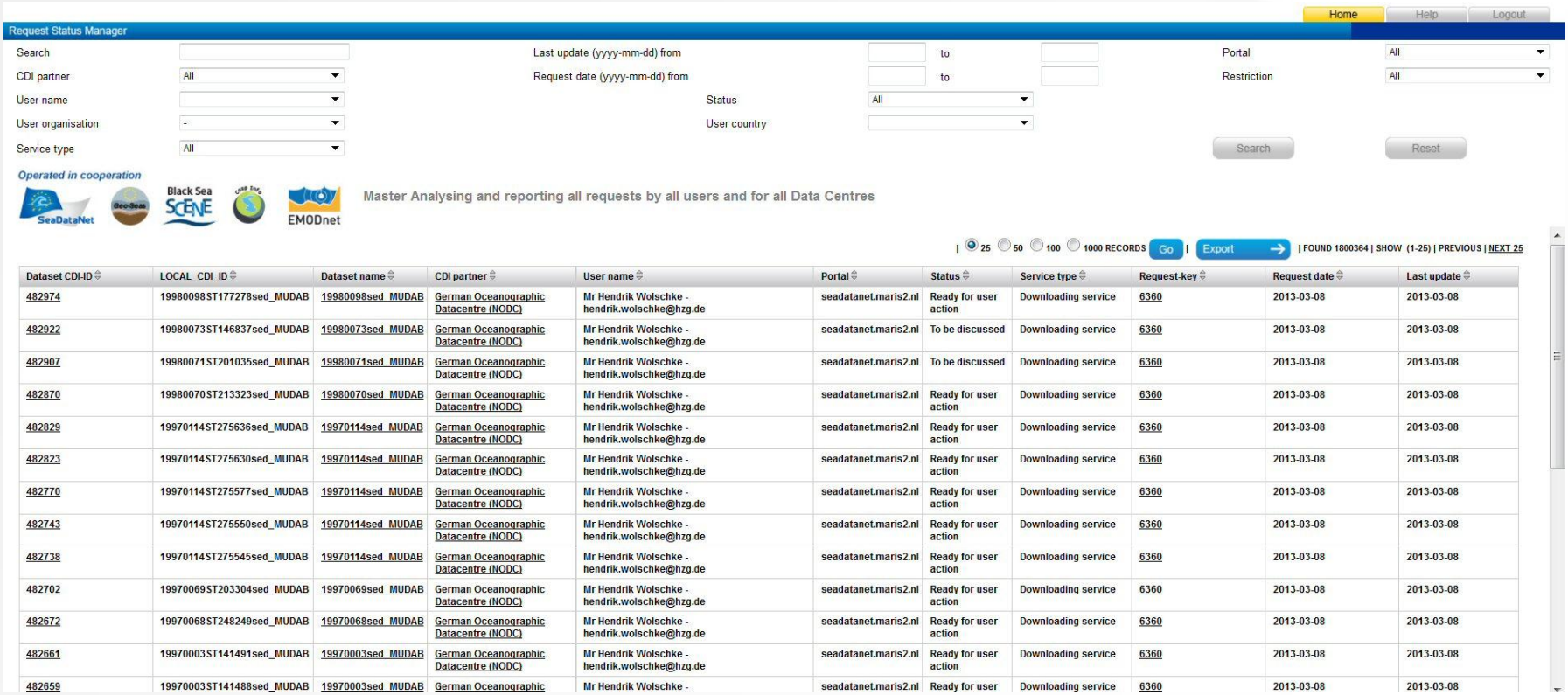
Request Status Manager

- Tracking and tracing of all shopping requests
- By users
- By data providers
- Analysis of transactions
- Checking status of orders and downloading from data providers



Request Status Manager - reporting

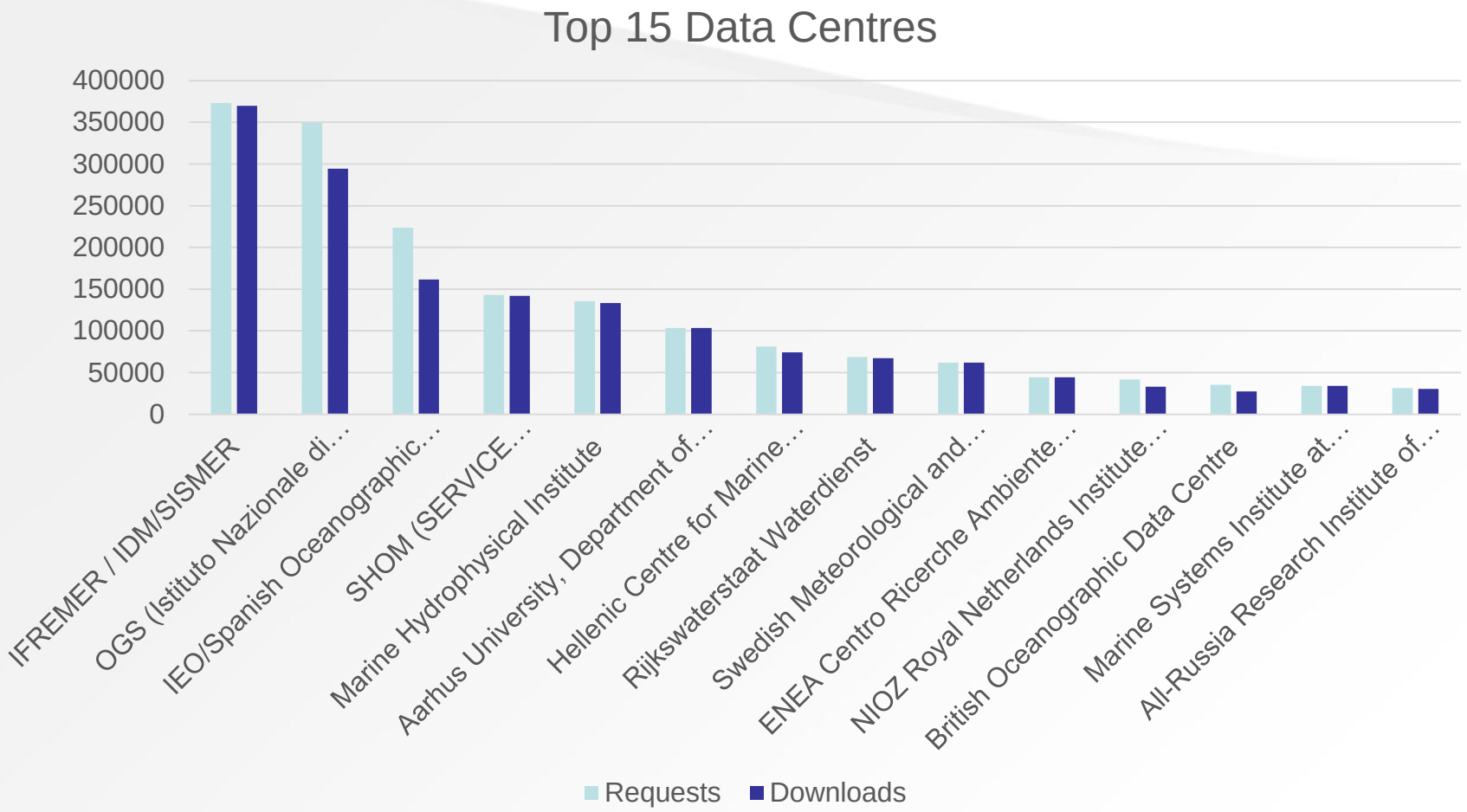
Overseeing all transactions and preparing reports



Dataset CDI-ID	LOCAL_CDI_ID	Dataset name	CDI partner	User name	Portal	Status	Service type	Request-key	Request date	Last update
482974	19980098ST177278sed_MUDAB	19980098sed_MUDAB	German Oceanographic Datacentre (NODC)	Mr Hendrik Wolschke - hendrik.wolschke@hzg.de	seadatanet.maris2.nl	Ready for user action	Downloading service	6360	2013-03-08	2013-03-08
482922	19980073ST146837sed_MUDAB	19980073sed_MUDAB	German Oceanographic Datacentre (NODC)	Mr Hendrik Wolschke - hendrik.wolschke@hzg.de	seadatanet.maris2.nl	To be discussed	Downloading service	6360	2013-03-08	2013-03-08
482907	19980071ST201035sed_MUDAB	19980071sed_MUDAB	German Oceanographic Datacentre (NODC)	Mr Hendrik Wolschke - hendrik.wolschke@hzg.de	seadatanet.maris2.nl	To be discussed	Downloading service	6360	2013-03-08	2013-03-08
482870	19980070ST213323sed_MUDAB	19980070sed_MUDAB	German Oceanographic Datacentre (NODC)	Mr Hendrik Wolschke - hendrik.wolschke@hzg.de	seadatanet.maris2.nl	Ready for user action	Downloading service	6360	2013-03-08	2013-03-08
482829	19970114ST275636sed_MUDAB	19970114sed_MUDAB	German Oceanographic Datacentre (NODC)	Mr Hendrik Wolschke - hendrik.wolschke@hzg.de	seadatanet.maris2.nl	Ready for user action	Downloading service	6360	2013-03-08	2013-03-08
482823	19970114ST275630sed_MUDAB	19970114sed_MUDAB	German Oceanographic Datacentre (NODC)	Mr Hendrik Wolschke - hendrik.wolschke@hzg.de	seadatanet.maris2.nl	Ready for user action	Downloading service	6360	2013-03-08	2013-03-08
482770	19970114ST275577sed_MUDAB	19970114sed_MUDAB	German Oceanographic Datacentre (NODC)	Mr Hendrik Wolschke - hendrik.wolschke@hzg.de	seadatanet.maris2.nl	Ready for user action	Downloading service	6360	2013-03-08	2013-03-08
482743	19970114ST275550sed_MUDAB	19970114sed_MUDAB	German Oceanographic Datacentre (NODC)	Mr Hendrik Wolschke - hendrik.wolschke@hzg.de	seadatanet.maris2.nl	Ready for user action	Downloading service	6360	2013-03-08	2013-03-08
482738	19970114ST275545sed_MUDAB	19970114sed_MUDAB	German Oceanographic Datacentre (NODC)	Mr Hendrik Wolschke - hendrik.wolschke@hzg.de	seadatanet.maris2.nl	Ready for user action	Downloading service	6360	2013-03-08	2013-03-08
482702	19970069ST203304sed_MUDAB	19970069sed_MUDAB	German Oceanographic Datacentre (NODC)	Mr Hendrik Wolschke - hendrik.wolschke@hzg.de	seadatanet.maris2.nl	Ready for user action	Downloading service	6360	2013-03-08	2013-03-08
482672	19970068ST248249sed_MUDAB	19970068sed_MUDAB	German Oceanographic Datacentre (NODC)	Mr Hendrik Wolschke - hendrik.wolschke@hzg.de	seadatanet.maris2.nl	Ready for user action	Downloading service	6360	2013-03-08	2013-03-08
482661	19970003ST141491sed_MUDAB	19970003sed_MUDAB	German Oceanographic Datacentre (NODC)	Mr Hendrik Wolschke - hendrik.wolschke@hzg.de	seadatanet.maris2.nl	Ready for user action	Downloading service	6360	2013-03-08	2013-03-08
482659	19970003ST141488sed_MUDAB	19970003sed_MUDAB	German Oceanographic	Mr Hendrik Wolschke -	seadatanet.maris2.nl	Ready for user	Downloading service	6360	2013-03-08	2013-03-08

Transactions in SDN2 CDI system – RSM

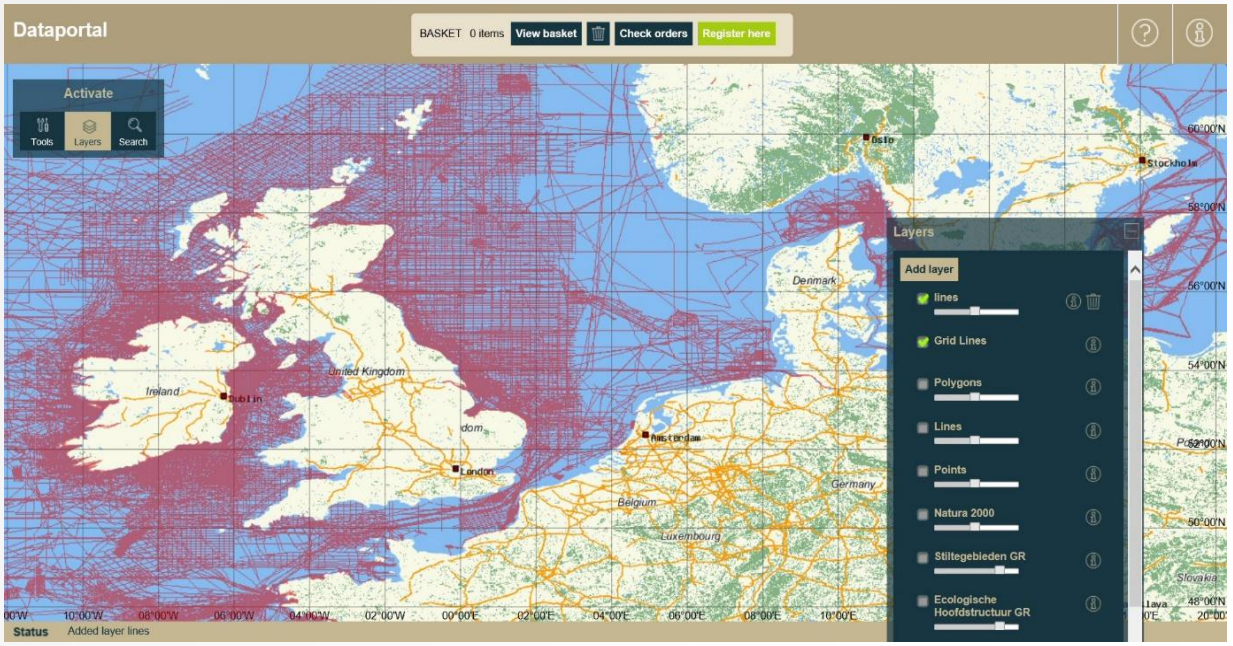
- **Since 1st October 2011:**
- Number of requests excluding robot users: **2055420 data sets**
- Number of downloaded files: **1862835 data sets**
- Done by**: 478 registered users**


Top 15 Data Centres
400000
350000
300000
250000
200000
150000
100000
50000
0
IFREMER / IDM/SISMER
OGS (Istituto Nazionale di…
IEO/Spanish Oceanographic…
SHOM (SERVICE…
Marine Hydrophysical Institute
Aarhus University, Department of…
Hellenic Centre for Marine…
Rijkswaterstaat Waterdienst
Swedish Meteorological and…
ENEA Centro Ricerche Ambiente…
NIOZ Royal Netherlands Institute…
British Oceanographic Data Centre
Marine Systems Institute at…
All-Russia Research Institute of…
Requests
Downloads

Machine interfaces for CDI – OGC WMS - WFS

- Open Geospatial Consortium (OGC) Web Map Service (WMS) and Web Feature Service (WFS) protocols to exchange maps and metadata including URLs to further metadata and data.
- The WMS URL for SeaDataNet is:

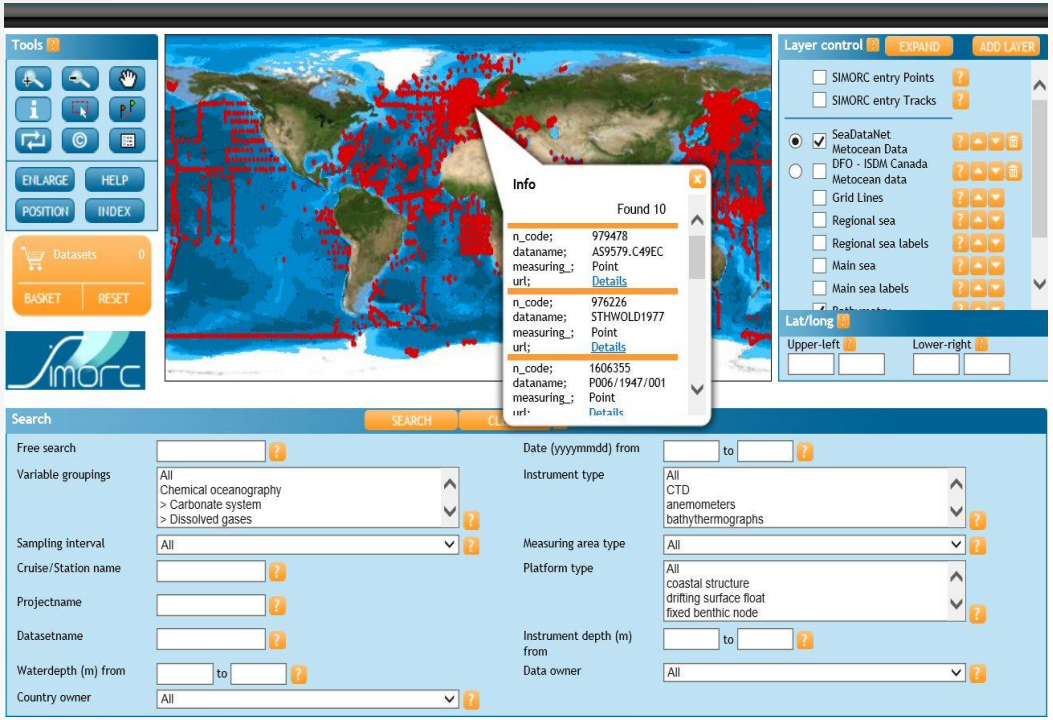
http://geoservice.maris2.nl/wms/seadatanet/seadatanet/



Machine interfaces for CDI – OGC WMS - WFS

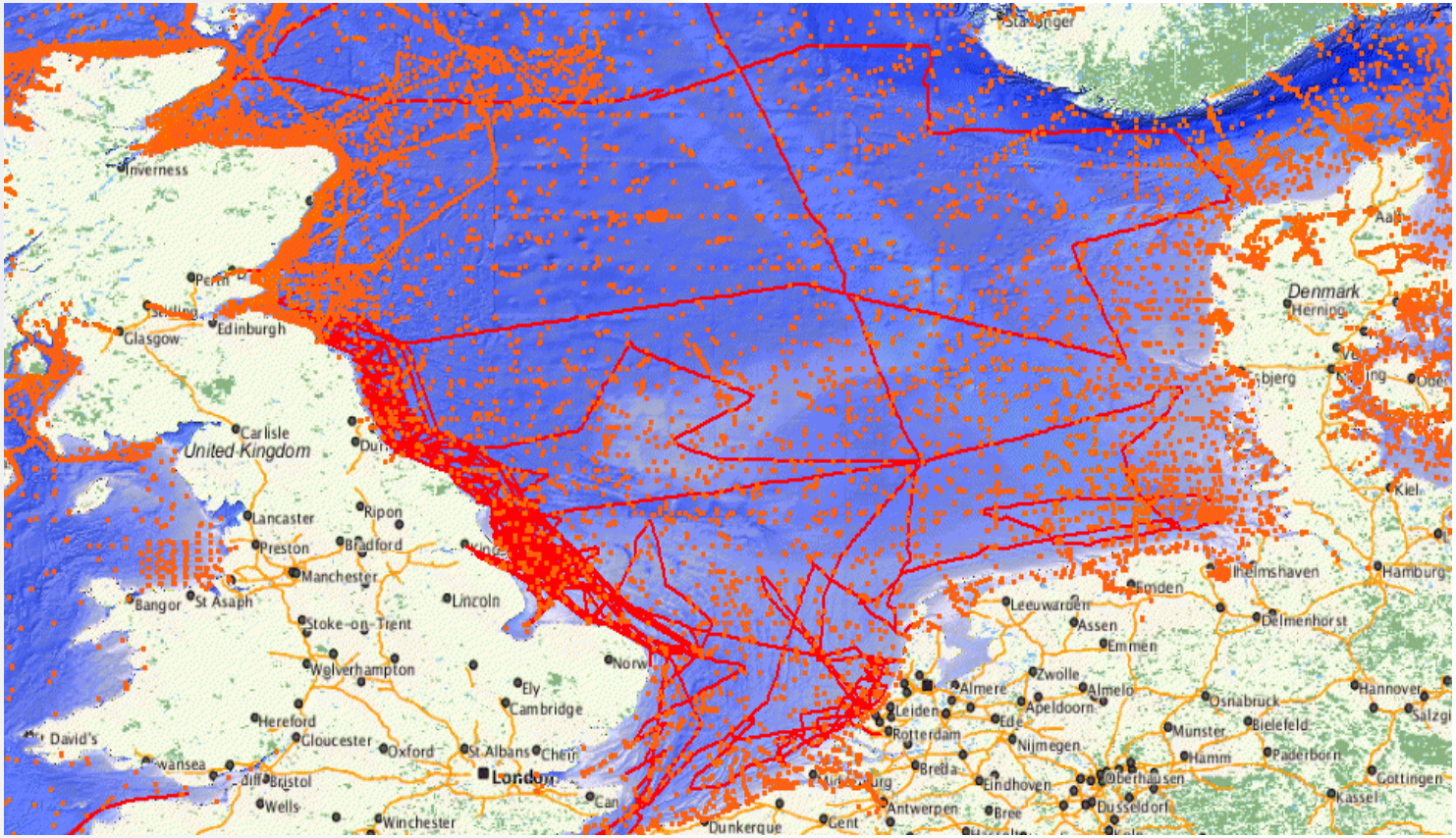
- WMS GetCapabilities also specifies how the WFS can be called and integrated in another portal. Implementing WFS is depending on the client and might require some programming.

Example: SIMORC



Machine interfaces for CDI – OGC WMS - WFS

- CDI User Interfaces support Add Layers via OGC WMS – WFS:



Example: *Map in CDI User Interface with selected CDI locations with background of bathymetry from EMODnet bathymetry and geography from Open Street Map WMS services*

Machine interfaces for CDI – OpenSearch

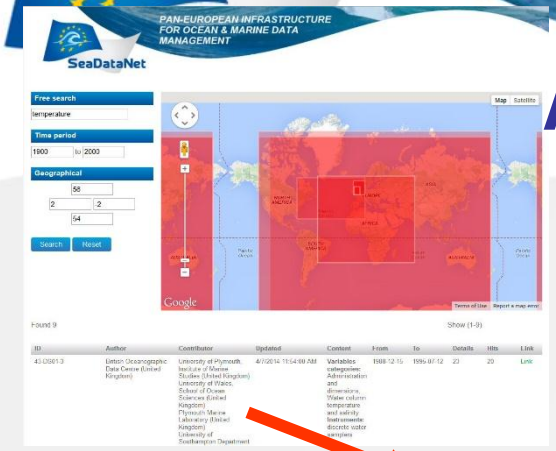
- **OpenSearch** is supported by Google, Yahoo, and others
- OpenSearch request is simple and consists of HTTP GET with parameters:
  - Free search
  - Geospatial (area or point + radius)
  - Temporal (from to)
- **SeaDataNet entry points** are generated as aggregations of the CDI observation discipline (code from the SeaDataNet P08 vocabulary), CDI data centre (code from the SeaDataNet EDMO directory), and geometric observation type (point / curve / area).
- Applying this gives at present 445 SeaDataNet OpenSearch entry points from CDI collection of > 1.6 million CDI entries
- OpenSearch Demonstration client:

http://seadatanet.maris2.nl/opensearch/client/search.php

- The actual OpenSearch service can be approached by:

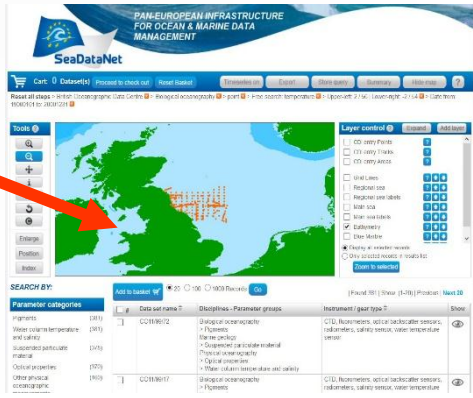
http://seadatanet.maris2.nl/opensearch/seadatanet/os_description

Machine interfaces for CDI – OpenSearch



43-DS01-4	British Oceanographic Data Centre (United Kingdom)	University of Cambridge Department of Earth Sciences (United Kingdom) University of East Anglia, School of Environmental Sciences (United Kingdom) University of Liverpool, Port Erin Marine Laboratory (United Kingdom) National Oceanography Centre, Southampton (United Kingdom) University of Wales, School of Ocean Sciences (United Kingdom)	3/18/2014 1:02:00 PM	**Variables categories:** Administration and dimensions, Water column temperature and salinity **Instruments:** discrete water samplers	1966-01-12	2013-02-13	24368	381	Link

Entrypoint ID | Data Centre | Parameters - Instruments | No of CDI in Entrypoint | No of selected CDIs | Link to SDN

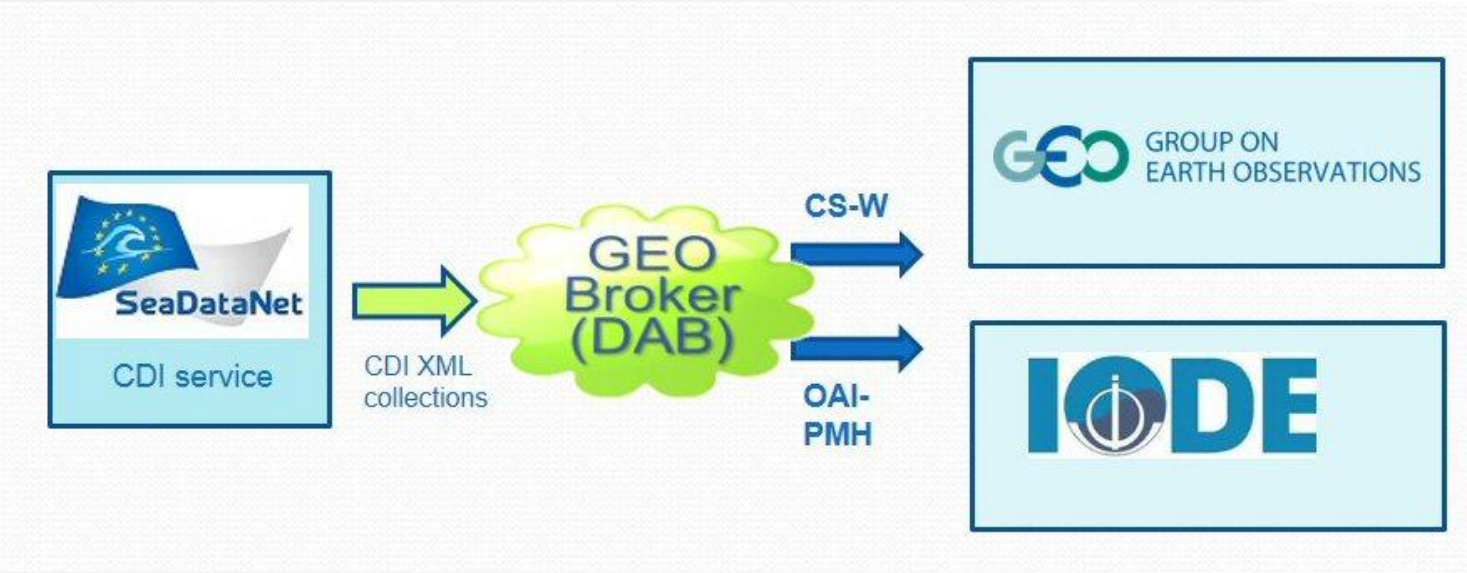


Interoperability with global portals

- **IOC IODE Ocean Data Portal (ODP),** technically developed by RIHMI-WDC
- **GEOSS portal**, major technical contribution by CNR
- Agreed on interoperability from the SeaDataNet CDI service with the 2 global portals by means of the **OGC CS-W (Catalogue Services for the Web)** standard protocol for exchanging ISO 19115 – 19139 XML coded metadata entries.
- Also agreed on exchanging at **CDI collection level** and not at CDI granules level (see earlier OpenSearch)
- This provides a standard interoperability which can also be applied by SeaDataNet towards other portals and is compliant with the EU INSPIRE Directive.

Interoperability with global portals

- CNR has set up the **GEO-DAB brokerage service** to harvest the CDI collection XML files and to convert these to the Brokerage Common Reference Model, and to provide these as CS-W and OAI-PMH services



- The **CSW 2.0.2 AP ISO** endpoint:

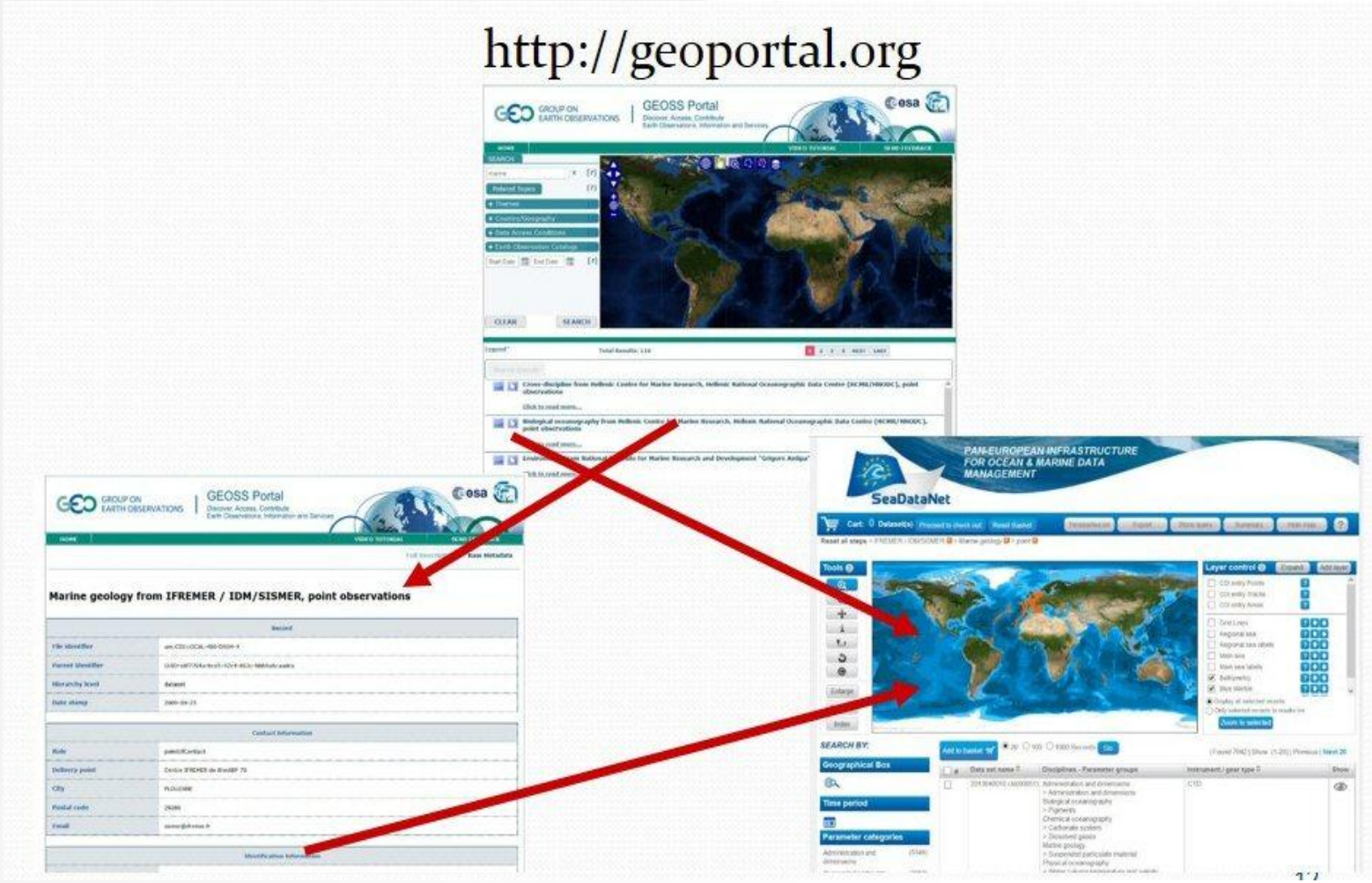
http://seadatanet.essi-lab.eu/gi-cat/services/cswiso

- The **OAI-PMH** endpoint:

http://seadatanet.essi-lab.eu/gi-cat/services/oaipmh

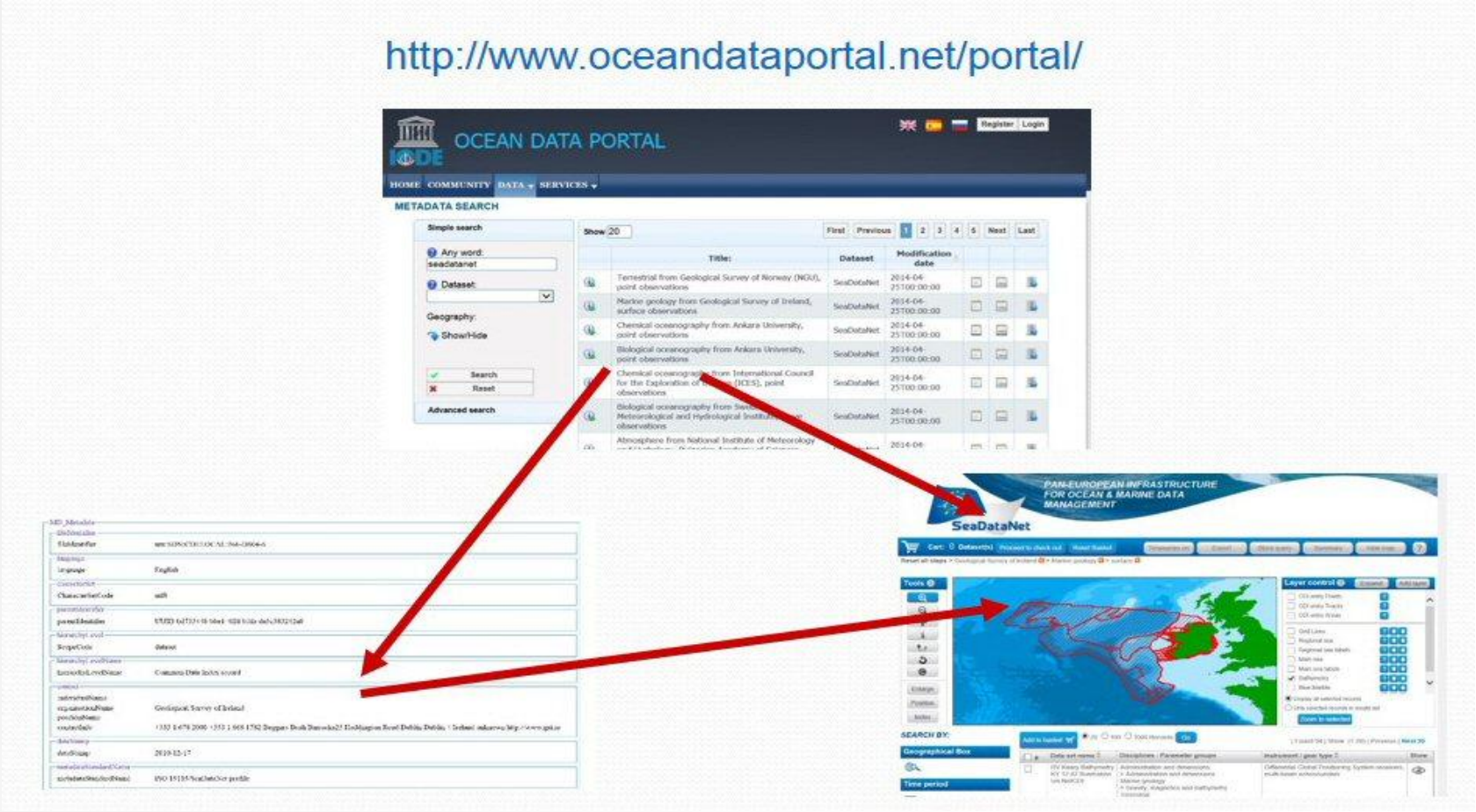
Interoperability with GEOSS – OGC CS-W

- The SeaDataNet CDI collections are harvested by the GEOSS portal from the CS-W service.



Interoperability with ODP – OAI-PMH

- The SeaDataNet CDI collections are harvested by the IODE ODP portal from the OAI-PMH service using jOAI harvester as also used in WMO-WIS for harvesting the collections XML files.



Harvesting and ingestion of CDI – planned implementation

- Objective is to upgrade the submission and processing of CDI entries from data centres to the CDI portal service by means of **harvesting and ingestion**
- IFREMER has adopted GeoNetwork for supporting CDI XML output of MIKADO and making it available by means of local CS-W service
- MARIS has tested central harvesting of CDI XML from the CS-W service (could also be provided by other local software than GeoNetwork)
- *Final check needed on XML consistency and criterium for harvesting only entries since specific date*
- **Challenge for pilot: central CDI ingestion taking into account the staging process and relational model CDI – coupling table – local data**

Harvesting and ingestion of CDI – planned implementation

- MARIS applies a staging process for populating new and updated CDI entries, received from data centres:
  - Validation of syntax and semantics
    if ok
  - Duplicates check => report to data centre for check
    if ok
  - Import of CDIs incl GML validation
    if ok
  - CDIs in Import CDI service and user interface for visual check by data centres
    if ok
  - Data centres must update Coupling Table and arrange Local Data sets
    if ok
  - CDIs moved to production CDI service for public use

- **Plan to upgrade this into an online system that data centres can manage themselves => establishing data centre self responsibility + 24 / 7**

Harvesting and ingestion of CDI – planned implementation

- Pilot in SeaDataNet II with a number of data centres
- Selected data centres will install GeoNetwork with IFREMER add-on's and CS-W and will use that to store output of MIKADO in specific server location
- MARIS will install CS-W harvester, configured for regular harvesting of new and updated CDI XML of each data centre
- New online CMS will be developed by MARIS and configured for each data centre for managing the ingestion in different steps from validation of new harvest up to inclusion in production. Extra attention for CDI deletions.
- Time scale? Development CMS by MARIS – till end 2014 - start pilot January 2015