Sensor Web Enablement (SWE) developments for fixed monitoring platforms and research vessels

By

Dick M.A. Schaap – SeaDataNet Technical Coordinator
with thanks to Jordi Sorribas - CSIC

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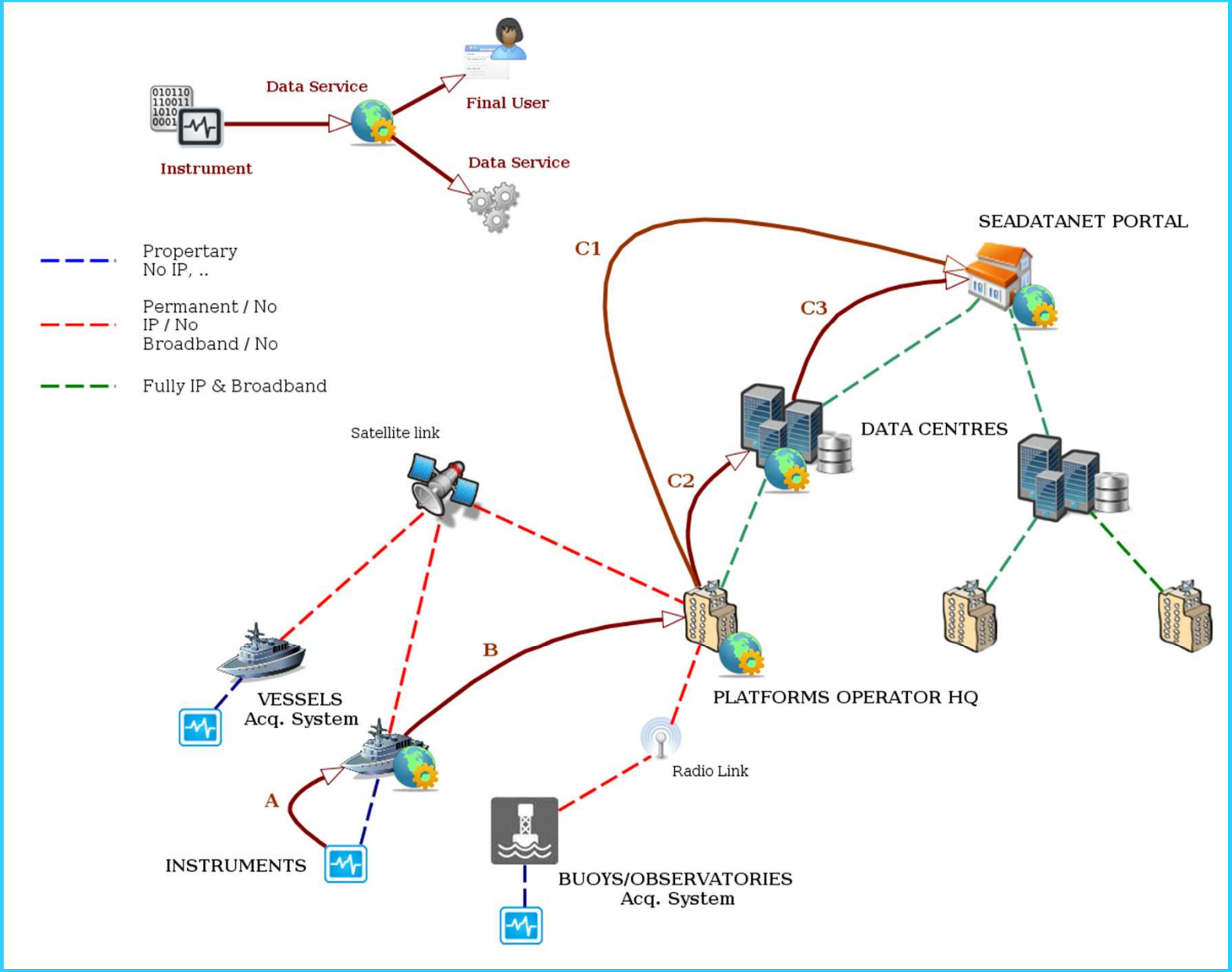
SWE Motivation

- **Increase the level of information provided for**:
  - Instrumentation used
  - Instrument history
    - Calibrations / Configuration
    - Composition
    - Operation and Maintenance
  - Complex Data Structures
- **Use a common way to:**
  - Access to Real Time Data
  - Access to Instrument Descriptions
- **Enhance existing Metadata descriptors:**
  - Common Data Index
  - EDIOS metadata

Sensor Web Enablement (SWE) for real-time flow of data to users



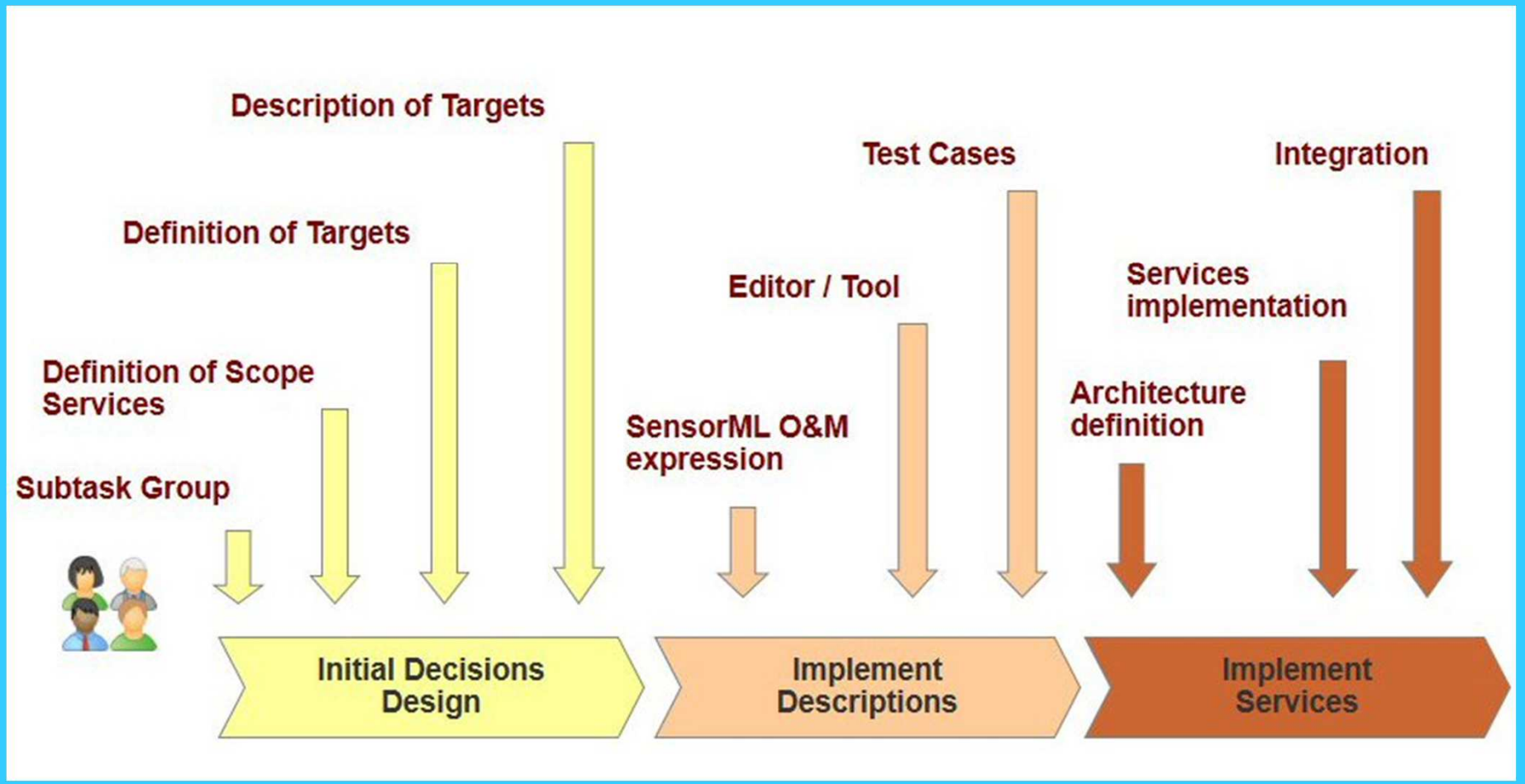
Several projects with SWE developments

- **SeaDataNet:** developing standards
- **EUROFLEETS:** enhancing the coordination of the European research vessel fleet and promoting the cost-effective use of these vessels. SWE is adopted to streamline the flow of marine data from the research vessels to the data centres and SeaDataNet infrastructure.
- **JERICO:** Joint European Research Infrastructure network for Coastal Observatories for better coordination between coastal observatories, development of new sensors, and best practice for setting up and operating coastal observatories. SWE is adopted for managing the stream of real-time data from sensors to the MyOcean forecasting services and the SeaDataNet data centres.
- **ODIP**: Ocean Data Interoperability Platform – cooperation with USA and Australia for common standards & interoperability solutions with SWE prototype project
- **Coordination** between these initiatives by SeaDataNet, lead by CSIC

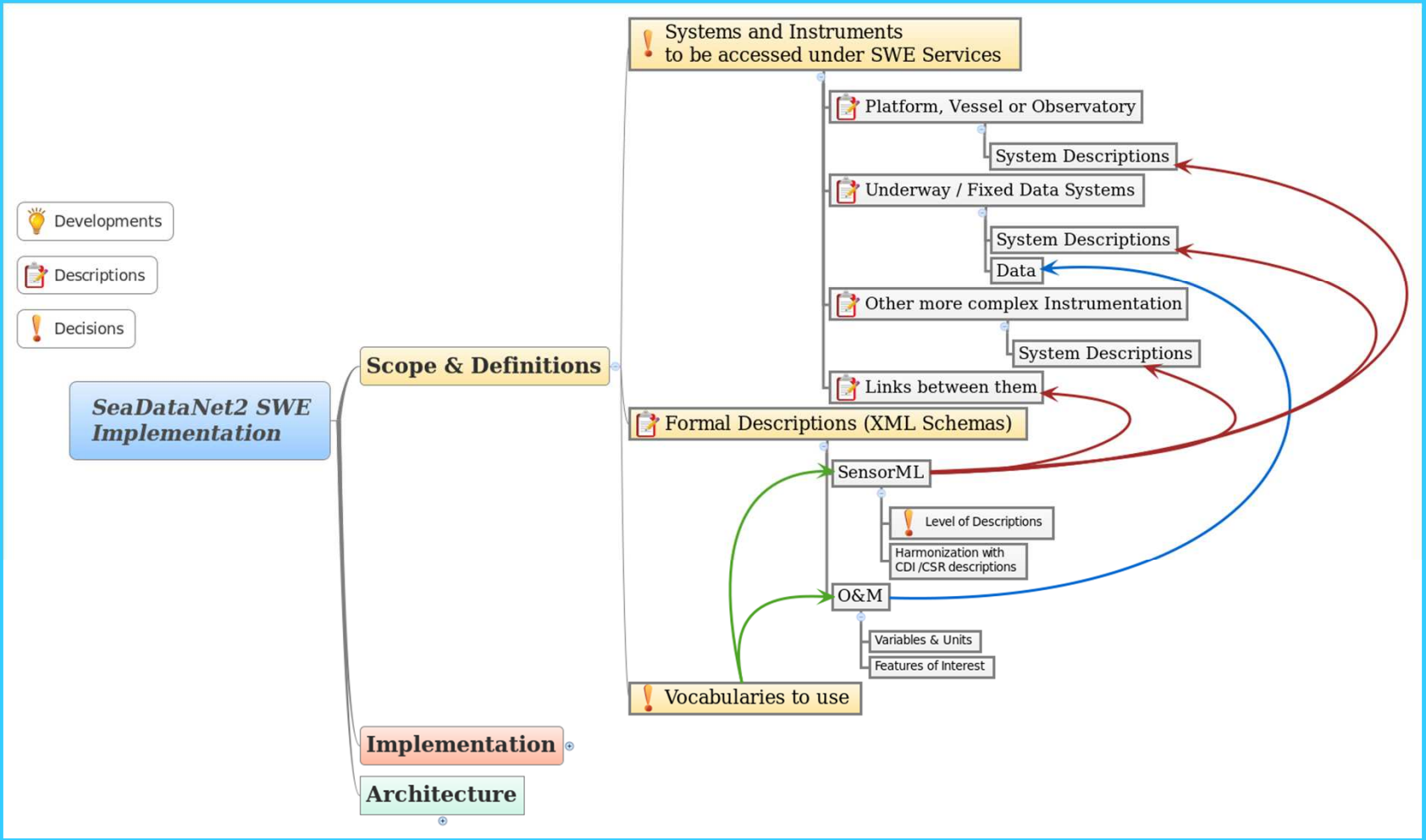
Components

- **OGC standard concepts:**
  - **SensorML profiles** to describe specific instruments
  - **Observation & Measurements (O&M) profiles** to provide data output
  - **Sensor Observation Service (SOS)** as a service to retrieve and visualise the data, possibly in real-time

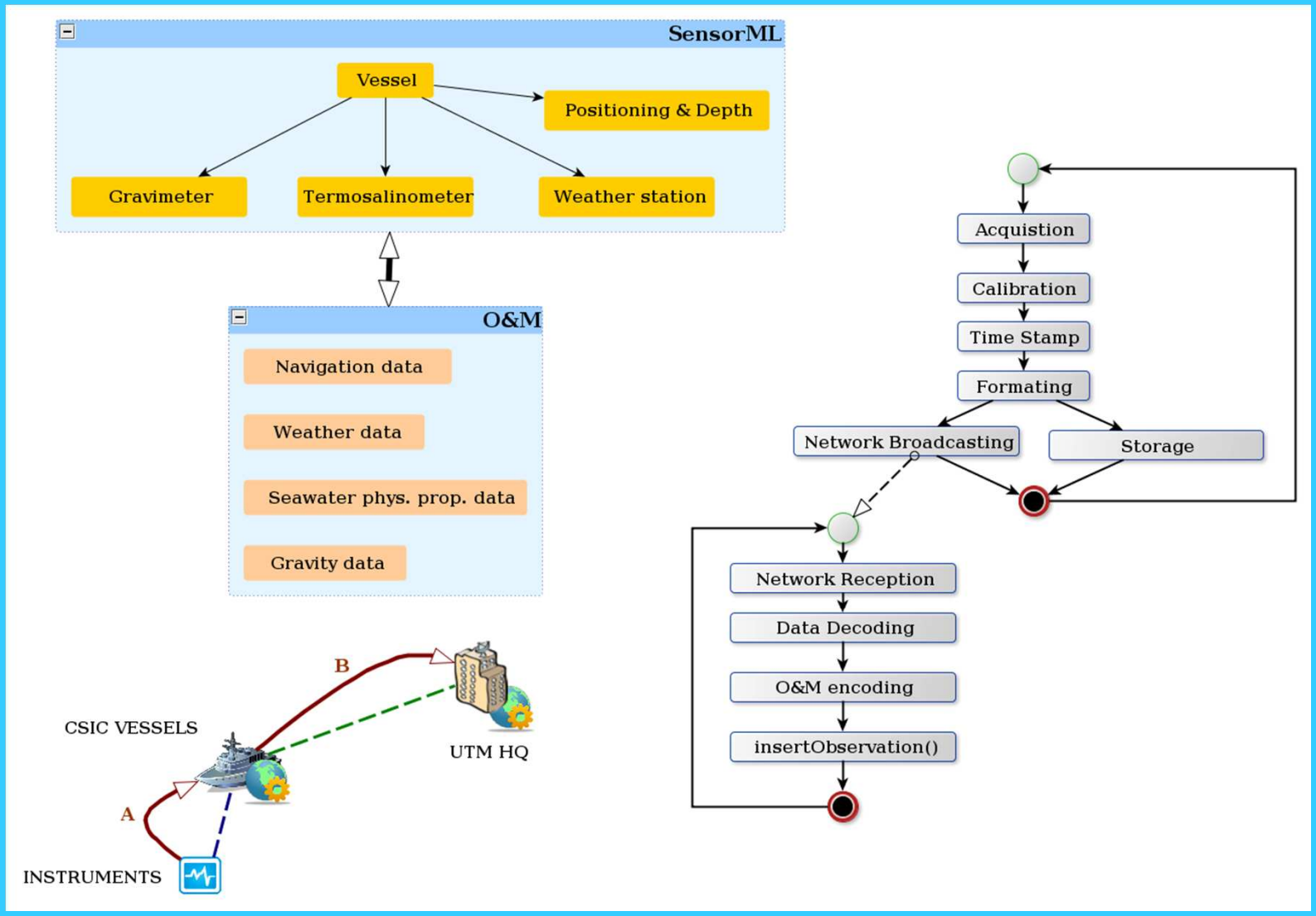
SWE development Roadmap



SWE adoption for fixed stations and research vessels



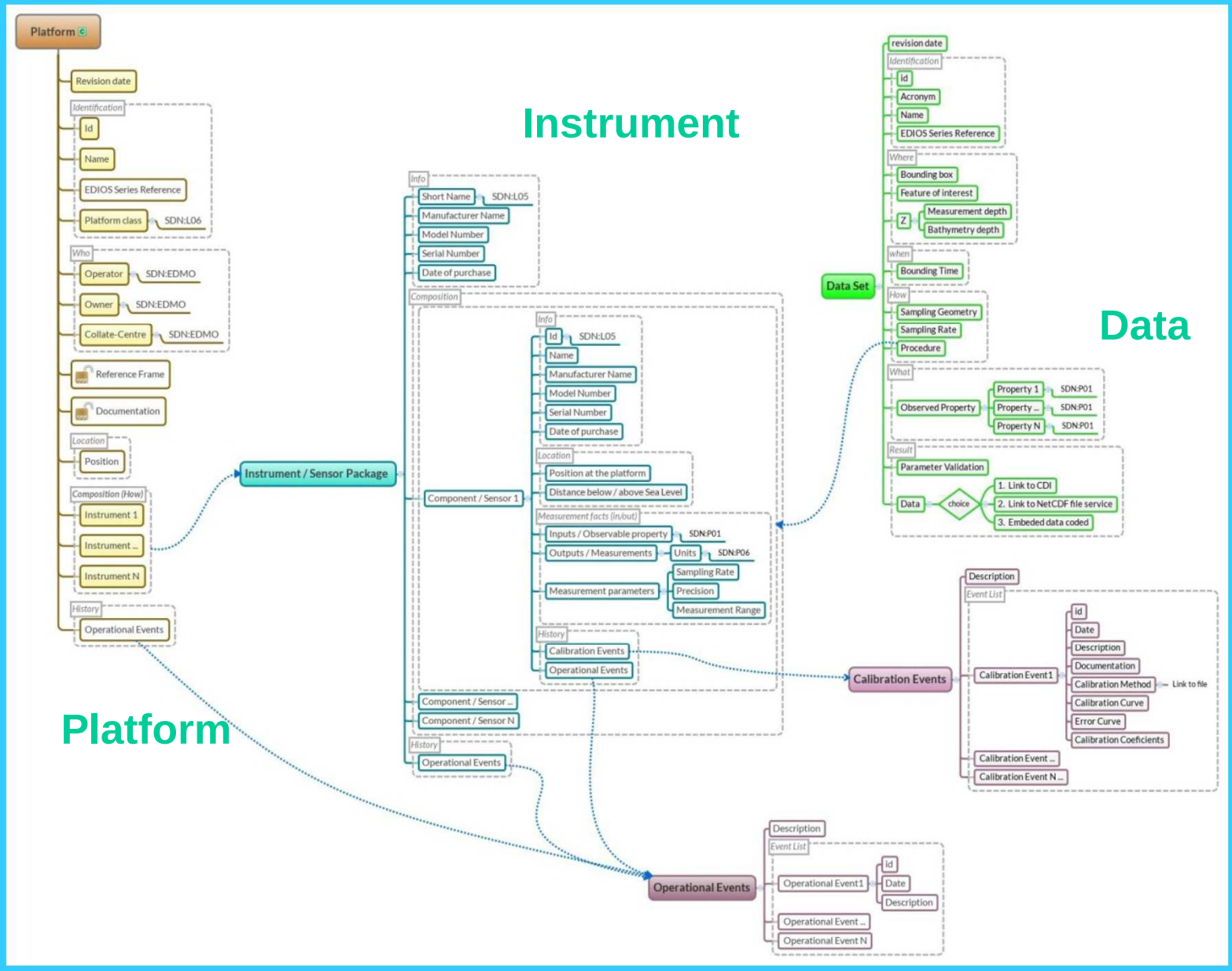
Data models adapted to specific marine observation data on board vessels



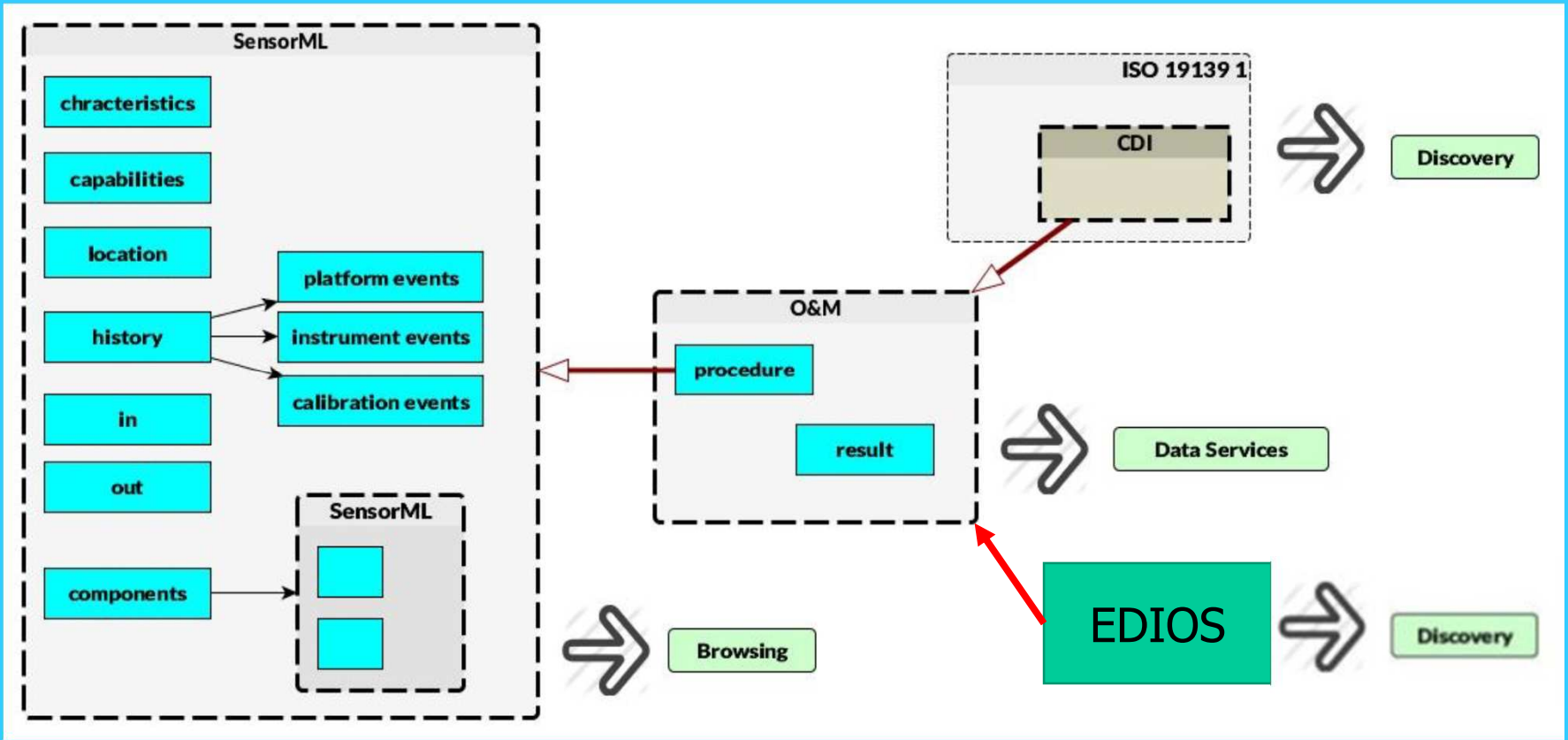
Data models adapted to specific marine observation data for SeaDataNet

- primary focus is on in-situ water column observations:
  - **Profiles**: CTD, profiling floats (ARGO), ..
  - **PointSeries**: moorings, including moorings with different vertical levels, ..
  - **Trajectories**: thermo-salinomers, gliders, ..

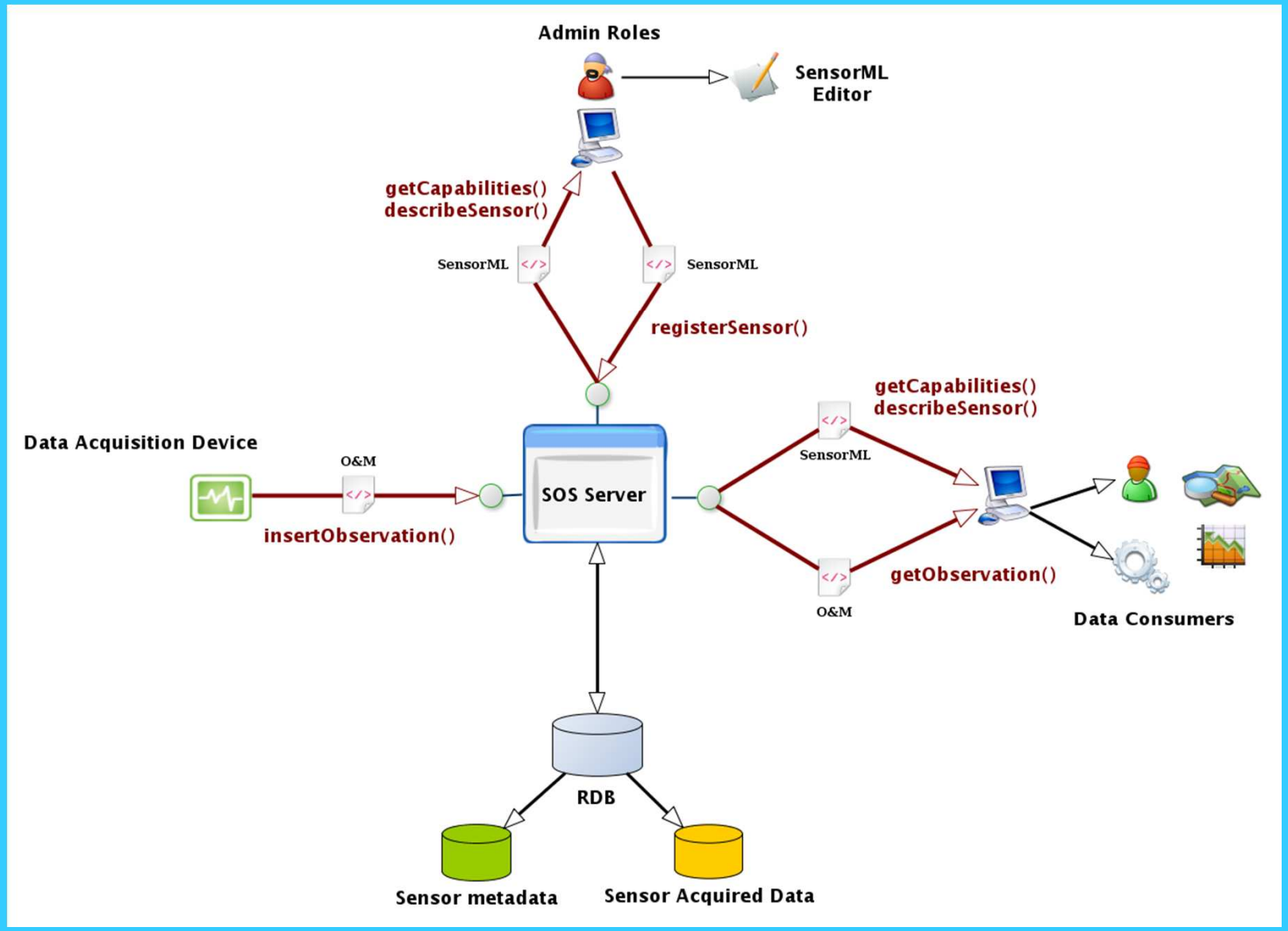
SensorML and O&M profiles



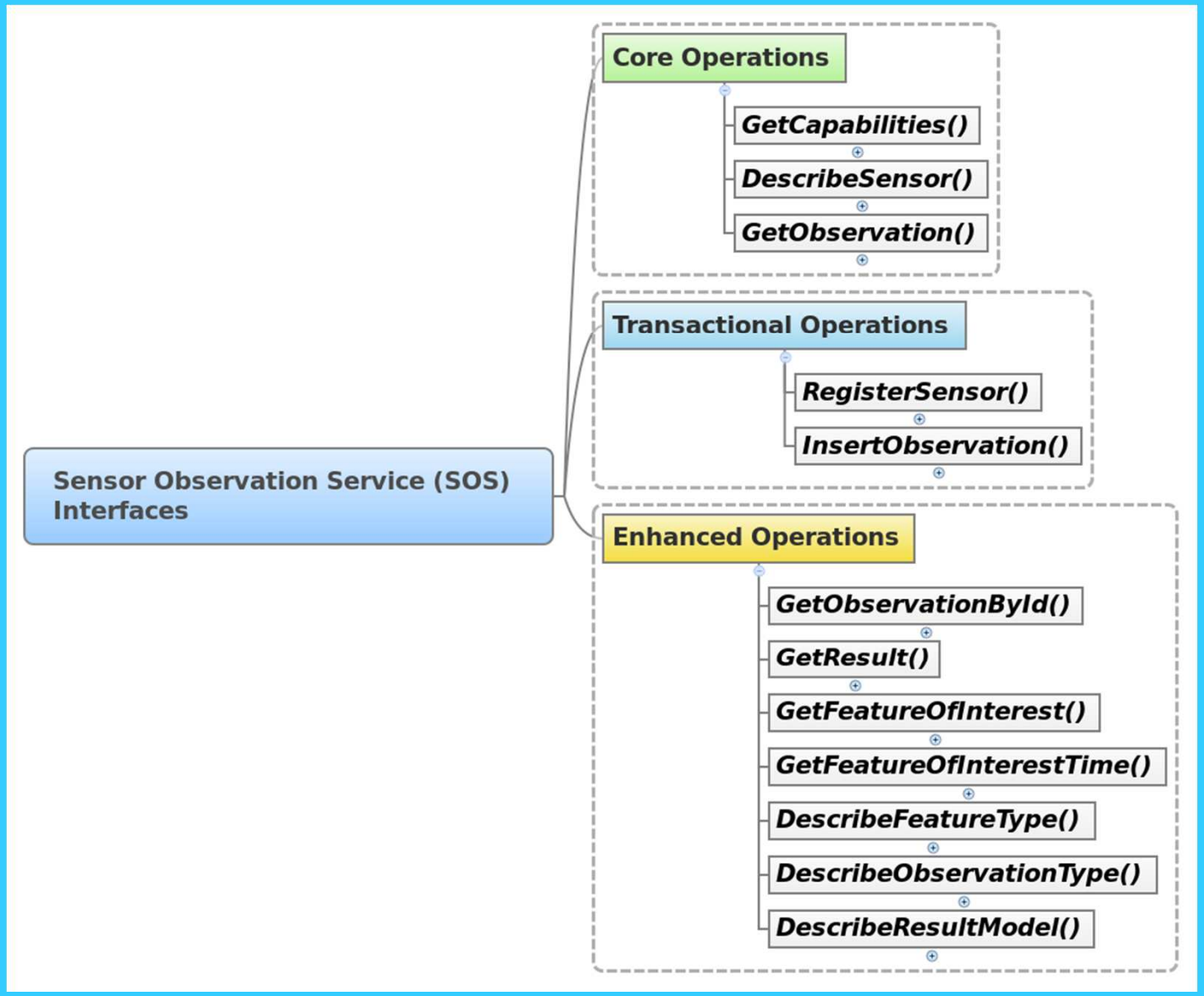
Sensor Web Enablement – Integration with CDI and EDIOS



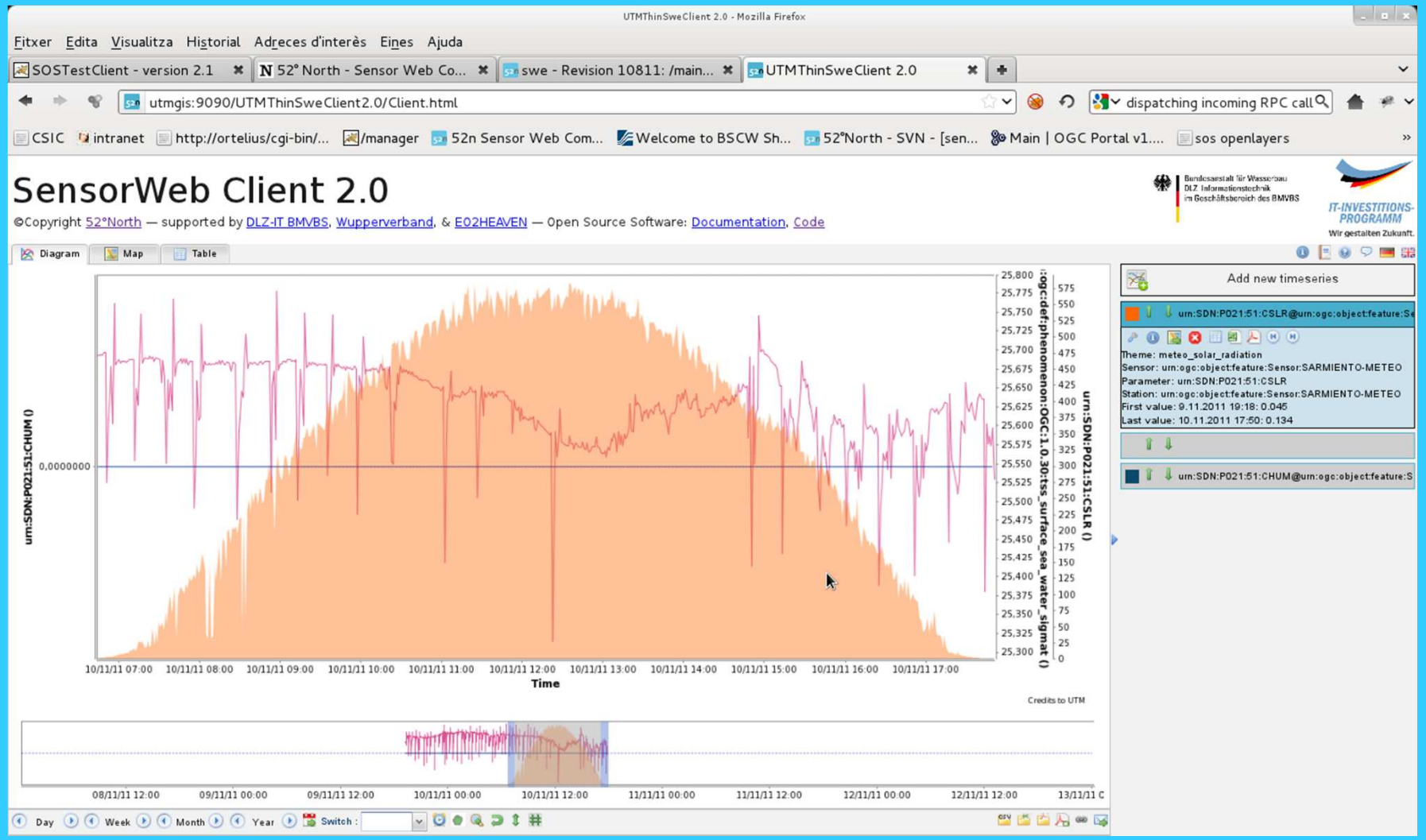
OGC Sensor Observation Service



OGC Sensor Observation Service interfaces



SOS Client


UTMThinSweClient 2.0 - Mozilla Firefox
Fitxer Edita Visualitza Historial Adreces d'interès Eines Ajuda
SOSTestClient - version 2.1
52° North - Sensor Web Co...
swe - Revision 10811: /main...
UTMThinSweClient 2.0
utmgis:9090/UTMThinSweClient2.0/Client.html
dispatching incoming RPC call
CSIC intranet http://ortelius/cgi-bin/... /manager 52n Sensor Web Com... Welcome to BSCW Sh... 52°North - SVN - [sen... Main | OGC Portal v1.... sos openlayers
SensorWeb Client 2.0
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Bundesanstalt für Wasserbau
DLZ Informationstechnik
im Geschäftsbereich des BMVBS
IT-INVESTITIONS-PROGRAMM
Wir gestalten Zukunft.
Diagram
Map
Table
Add new timeseries
urn:SDN:P021:51:CSLR@urn:ogc:object:feature:Se
Theme: meteo_solar_radiation
Sensor: urn:ogc:object:feature:Sensor:SARMIENTO-METEO
Parameter: urn:SDN:P021:51:CSLR
Station: urn:ogc:object:feature:Sensor:SARMIENTO-METEO
First value: 9.11.2011 19:18: 0.045
Last value: 10.11.2011 17:50: 0.134
urn:SDN:P021:51:CHUM@urn:ogc:object:feature:S
urn:SDN:P021:51:CHUM ()
urn:SDN:P021:51:CSLR ()
:ogc:def:phenomenon:OGC:1.0.30:tss_surface_sea_water_sigmat ()
0,0000000
10/11/11 07:00 10/11/11 08:00 10/11/11 09:00 10/11/11 10:00 10/11/11 11:00 10/11/11 12:00 10/11/11 13:00 10/11/11 14:00 10/11/11 15:00 10/11/11 16:00 10/11/11 17:00
Time
Credits to UTM
08/11/11 12:00 09/11/11 00:00 09/11/11 12:00 10/11/11 00:00 10/11/11 12:00 11/11/11 00:00 11/11/11 12:00 12/11/11 00:00 12/11/11 12:00 13/11/11
Day Week Month Year Switch :

Select Research Vessel

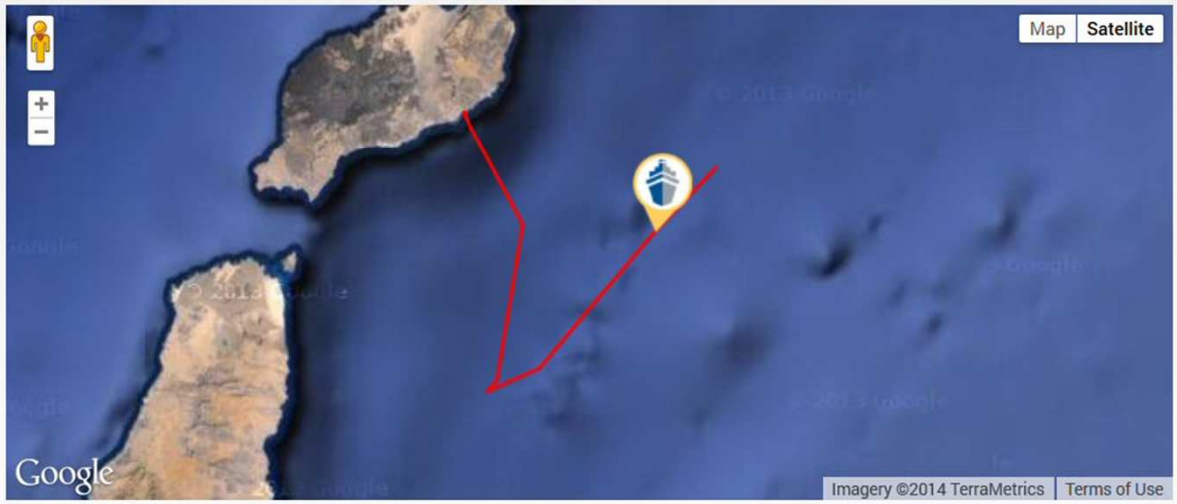
- (•) Sarmiento de Gamboa
- ( ) Hesperides

Select mode

- (•) dynamic position, bearing and speed of selected RV
- ( ) track-chart from prototype start to present with geographic positions, speeds and bearings

Retrieve the 24 hours Ship Summary Report (SSR) and related log of events by clicking on any position of the vessel track.

- (•) Off
- ( ) On



vessel_name	Sarmiento de Gamboa
vessel_c174	SDN:C174:124:29AH
last_navigation_update	2014-03-30T04:00:11
last_date	2014-03-30T04:00:06

Date	Speed	Bearing
2014-03-28T12	8.5	6.5
2014-03-28T13	9.3	275.9
2014-03-28T14	8.6	230.0

SWE time line

- Finalise soon SensorML and O&M profiles for selected instruments on board vessels and mounted on platforms
- XML editor for generating these XML profiles
- Set-up a number of SOS pilots with OGS, CNR, IFREMER, CSIC
- Evaluation and bench marking with ODIP partners
- Guidelines, profiles and tools
- Further deployment in SeaDataNet, JERICO and EuroFleets 2