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# **SeaDataNet Cruise Summary Report (CSR) metadata model for Cruise Reporting – XML encoding**

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## **Submitted by:**

Dick M.A. Schaap  
Technical Coordinator SeaDataNet  
MARIS  
The Netherlands

Friedrich Nast, Anne Che-Bohnenstengel  
SeaDataNet Cruise Summary Reports (CSRs) Directory Central Managers  
Bundesamt fuer Seeschifffahrt und Hydrographie (BSH)  
Germany

Enrico Boldrini  
CNR-IIA  
Italy

Stefano Nativi  
CNR-IIA  
Italy

Michele Fichaut  
SeaDataNet Coordinator  
IFREMER  
France

**Title:** SeaDataNet Cruise Summary Report (CSR) metadata model for Cruise Reporting – XML encoding

**Scope:** Proposal to adopt SeaDataNet CSR XML encoding as the reference XML implementation of SeaDataNet CSR metadata model.

SeaDataNet CSR XML encoding has been drafted, published and firstly implemented in the context of SeaDataNet, the leading infrastructure in Europe for marine & ocean data management. Its wide implementation, both by data centres within SeaDataNet and by external organizations makes it also a de-facto standard in the Europe region.

The acknowledgement of SeaDataNet CSR XML encoding as a recommended standard by IODE/JCOMM will further favour interoperability between European data centres and outreach to the broader marine community.

**Envisaged publication type:** The proposal target audience includes all the European bodies, programs, and projects that manage and exchange cruise reports. Besides, the proposed document informs all the international community dealing with marine and oceanographic data about the reference XML implementation of the SeaDataNet CSR metadata model.

**Purpose and Justification:** Provide details based wherever practicable.

1. Describe the specific aims and reason for this Proposal, with particular emphasis on the aspects of standardization covered, the problems it is expected to solve or the difficulties it is intended to overcome.

By acknowledging SeaDataNet CSR XML encoding as the reference XML implementation for the SeaDataNet CSR metadata model, multiple objectives are sought:

- Wider adoption of SeaDataNet CSR XML encoding by additional marine data centres around European waters. The process will favour further harmonisation and standardisation of European ocean and marine metadata as well as interoperability by reducing the existing metadata formats heterogeneity. Organizations adopting this standard will be able to encode their marine metadata according to a well-known and well specified structure, therefore the data management and exchange of marine and oceanographic information will be eased in many ways (see following point 2).
  - Ease interoperability and outreach towards international communities and initiatives. The existence of a recognized standard encoding for SeaDataNet CSR at European level will favour its understanding also at a broader level. Example given, international marine and oceanographic communities will be able to correctly understand (both syntactically and semantically) the information contained in SeaDataNet CSR documents (e.g. also with the help of appropriate software).
2. Describe how this proposed standard supports data management, exchange or interoperability. When applicable include mention of what data management functions (e.g. data transport, quality control, archive) the proposal supports.

SeaDataNet CSR XML encoding supports data management by providing an implementation based on ISO 19139 XML and containing as well specific SeaDataNet schema extensions (established through the ISO extension methodology). This XML implementation fully enable encoding and validation of the information described by SeaDataNet CSR metadata model.

A set of Schematron rules further enacts validation, assuring compliancy of encoded XML documents to SeaDataNet CSR metadata model, ISO 19115, ISO 19115-2 and European directive INSPIRE (in particular INSPIRE implementing rules have been followed). Interoperability with software tools supporting such international standards and directives (such as catalogs or metadata editors) is thus favoured.

The Schematron rules enable as well validation of vocabulary restricted elements against online code lists published by SeaDataNet following ISO guidelines.

3. Describe the main interests benefitting from or affected by the proposed standard, such as industry, consumers, governments, distributors. Identify any relationships and/or dependencies.

Adoption by IODE/JCOMM of SeaDataNet CSR XML encoding as a metadata standard will give extra momentum to European marine and ocean data centres adopting SeaDataNet CSR. This will also benefit users from all over the world from various sectors. Moreover, it will benefit efforts for global interoperability (such as ODIP project activities) because that process can focus on a limited set of marine metadata profiles, whereby SeaDataNet CSR represents European input.

4. Describe the feasibility of implementing the proposed standard. Include any factors that could hinder the successful establishment or global application of the Proposed standard. Are there any associated issues? Identify resource implications resulting from the recommendations.

The feasibility and practicality of implementing the SeaDataNet CSR XML encoding can be, and has already been successfully accomplished at 57 data centres within the SeaDataNet partnership. Moreover another 47 data centres in Europe at present have realized the CSR XML encoding. The results of these activities can be followed at the operational CSR Inventory portal, that can be reached through the SeaDataNet portal (<http://www.seadatanet.org/Metadata>). The implementation is supported by dedicated Training Workshops which deal with explaining the standards and the associated tools and which provide hands-on training activities to get fully acquainted with the standards and tools. The training material is also documented in Vademecums for study and consultation. The time needed for full implementation at a data centre is approximately 6 months considering the mapping of legacy collections to SeaDataNet CSR and deployment of the associated SeaDataNet CDI tools.

5. Considering the needs of other fields or organizations, indicate the timeliness, target date(s), or if proposing a series of standards, suggest priorities. List any statutory requirement or other driving factors.

There are no statutory requirements for adoption of the SeaDataNet CSR standard as one of the metadata discovery standards. The National Oceanographic Data Centres in Europe are bound to implement the standard within their contractual obligations of

several EU projects. The NODCs also motivate other data centres in their countries to adopt it. The IOC recommendation will add to this process.

Describe the possible benefits gained by the implementation of the proposed standard. Alternatively, describe the loss or disadvantage(s) if no standard is established within a reasonable time.

The advantage of using the SeaDataNet CSR standard in Europe is described in (2) and (3). There are no anticipated disadvantages to adopting it.

Indicate whether the proposed standard is or may become the subject of regulations or may require the harmonization of existing regulations. Describe any impacts of this activity.

The SeaDataNet CSR XML encoding standard is a de-facto standard in Europe and is currently subject of tests for its possible use outside of the European region (e.g. in the context of the ODIP project).

***Current Operational Implementations:*** At present already 57 NODC's and marine data centres within the SeaDataNet consortium have successfully implemented the SeaDataNet CSR XML encoding standard and are maintaining their CSRs at their local centre and submitting them via online Content Management System (CMS) or XML encoded to the CSR central directory of the SeaDataNet infrastructure (see <http://www.seadatanet.org>). The CSR standard has already been adopted by a number of other European projects raising the total number of contributing data centres to 104. These projects are:

- **Up-Grade Black Sea SCENE project (2009-2011)** that involves 6 NODCs and many other data holding institutes from 6 Black Sea countries
- **CASPINFO project (2009-2011)** that involves 12 institutes and the private industry from the Caspian Sea region.
- **Geo-Seas project (2009-2012)** that involves 24 geological and geophysical data centres from 16 European countries (EuroGeoSurveys)
- **EuroFleets project (2009-2012)** that involves 24 research institutes and data centres from 17 European countries
- **JERICO project (2011-2015)** that involves 27 institutes from 17 European countries.
- **EMODnet chemistry, hydrography, physics project lots** in which SeaDataNet has qualified itself as leading infrastructure for the EMODNet data management component
- **ODIP (Ocean Data Interoperability Platform)** in which SeaDataNet and its metadata profiles are the de-facto European standards to the efforts of establishing interoperability solutions between Cruise reporting systems in Europe, US and Australia.

- **POGO (Partnership for Observation of the Global Oceans)** in which SeaDataNet CSR is in use at the POGO/Research Vessels (RVs) portal. (<http://www.pogo-oceancruises.org/>).

The results of these activities can be followed at the SeaDataNet Cruise Summary Report inventory, through which data collections related to individual cruises can be searched, evaluated and accessed.

Moreover, different software tools are implementing SeaDataNet CSR, such as the MIKADO metadata editor and the GI-cat discovery broker.

### **Relevant Documents:**

The following document (attached to the current proposal) is the normative specification for the SeaDataNet CSR XML encoding:

- E.Boldrini, S.Nativi. SeaDataNet CSR metadata profile of ISO 19115 and ISO 19115-2 – XML encoding, Version 3.0.0, September 2013, published at <http://www.seadatanet.org/Standards-Software/Metadata-formats/CSR>

The following online schemas are normative references for CSR XML encoding:

- CSR profile XML schema definition, Version 3.0.0, September 2013, published at [http://schemas.seadatanet.org/Standards-Software/Metadata-formats/SDN2\\_CSR\\_ISO19139\\_3.0.0.xsd](http://schemas.seadatanet.org/Standards-Software/Metadata-formats/SDN2_CSR_ISO19139_3.0.0.xsd)
- CSR profile Schematron rules definition, Version 3.0.0, September 2013, published at [http://schemas.seadatanet.org/Standards-Software/Metadata-formats/SDN2\\_CSR\\_ISO19139\\_3.0.0.sch](http://schemas.seadatanet.org/Standards-Software/Metadata-formats/SDN2_CSR_ISO19139_3.0.0.sch)
- CSR Extension information, Version 3.0.0, September 2013, published at <http://schemas.seadatanet.org/Standards-Software/Metadata-formats/csrExtensionInformation.xml>

The following document is provided for informative purpose:

- Sample CSR metadata XML document, published at: <http://www.seadatanet.org/Standards-Software/Metadata-formats/CSR>

The SeaDataNet CSR homepage represents as well an informative reference for SeaDataNet CSR, containing related standards (e.g. the SeaDataNet CSR metadata model) and useful documentation:

- SeaDataNet CSR metadata profile Homepage, at <http://www.seadatanet.org/Standards-Software/Metadata-formats/CSR>

### **Cooperation and liaison:**

1. **Existing Community:** All the organizations listed in the '**Current Operational Implementations**' section are using SeaDataNet CSR in an operational environment and represent the SeaDataNet CSR community. In particular MARIS, CNR-IIA and IFREMER have been involved in the drafting and publication of the SeaDataNet CSR XML encoding standard (together with the rest of the SeaDataNet Technical Task Team) and are responsible for the current proposal submission.

2. **Expanded Community:** Firstly, other relevant marine and oceanographic data centres in Europe that are not yet engaged in the NODC national networks and/or any of the EU projects and would like to adopt SeaDataNet CSR as the metadata model for their cruise reports.

Moreover, other marine and oceanographic data centres worldwide eager to discover, evaluate and access SeaDataNet cruise reports at full. SeaDataNet is maintaining active cooperation and exchange on an international scale with data management initiatives and networks outside Europe (such as ODIP) where common standards and interoperability solutions are investigated.

### **Contact information:**

Name: Friedrich Nast, Anne Che-Bohnenstengel  
Organization: Bundesamt fuer Seeschifffahrt und Hydrographie (BSH)  
Address: Bernhard-Nocht-Str. 78  
20359 Hamburg, Germany  
Email Address: Friedrich.Nast@bsh.de, Anne.Che-Bohnenstengel@bsh.de  
Telephone Number: +49 (0) 40 3190-3410, +49 (0) 40 3190-3421

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### **List of Acronyms:**

- CDI – Common Data Index
- CNR-IIA – National Research Council of Italy – Insitute of Atmospheric Pollution Research
- EDMED - SeaDataNet European Directory of Marine Environmental Data sets
- EDMERP - SeaDataNet European Directory of Marine Environmental Research Projects
- EDMO – SeaDataNet European Directory of Marine Organisations
- EMODNET – European Marine Observation and Data Network
- EU – European Union
- EuroFleets – EU FP7 project Towards an Alliance of European Research Fleets
- GEOSS – Group on Earth Observation System of Systems
- Geo-Seas - EU FP7 project for a Pan-European Infrastructure for Marine Geological and Geophysical Data Management
- IFREMER – Institut Francais de recherche pour l’exploitation de la mer
- IOC – Intergovernmental Oceanographic Commission
- IODE – International Oceanographic Data and Information Exchange
- ISO – International Organization for Standardization
- MARIS – Mariene Informatie Service
- MIKADO – SeaDataNet metadata editor software tool
- MMI – Marine Metadata Initiative

- MSFD - Marine Strategy Framework Directive
- NEMO – SeaDataNet ASCII data formats conversion software tool
- NODC – National Oceanographic Data Center
- ODIP - Ocean Data Interoperability Platform
- ODP - Ocean Data Portal
- SeaDataNet – EU FP6 project for a Pan-European Infrastructure for Marine and Oceanographic Data Management
- SeaVoX – mailing list governing the SeaDataNet Common Vocabularies
- Upgrade Black Sea SCENE - EU FP7 project for an Upgrade Black Sea Scientific Network
- URL – Uniform Resource Locator

**Other Attachments:** No other attachments.