



INSPIRE

Infrastructure for Spatial Information in Europe

DT Metadata – 1.2 Analysis of Reference Documentation

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1 Foreword

INSPIRE is a Directive providing general rules for the establishment of an Infrastructure for Spatial Information in Europe. The purpose of such an infrastructure is to assist policy-making in relation to policies that may have a direct or indirect impact on the environment.

INSPIRE should be based on the infrastructures for spatial information that are created by the Member States and are designed to ensure that spatial data are stored, made available and maintained at the most appropriate level; that it is possible to combine spatial data from different sources across the Community in a consistent way and share them between several users and applications; that it is possible for spatial data collected at one level of public authority to be shared between other public authorities; that spatial data are made available under conditions which do not unduly restrict their extensive use; that it is easy to discover available spatial data, to evaluate their suitability for the purpose and to know the conditions applicable to their use. For these reasons, the Directive focuses in particular on five key areas: metadata, the interoperability and harmonisation of spatial data and services for selected themes (as described in Annexes I, II, III of the Directive); network services and technologies; measures on sharing spatial data and services; coordination and monitoring measures.

The text of the INSPIRE Directive agreed by Parliament and Council is available from the INSPIRE web site (www.ec-gis.org/inspire). The Directive, which is expected to be adopted in February 2007, identifies what needs to be achieved, and Member States have two years from the date of adoption to bring into force national legislation, regulations, and administrative procedures that define how the agreed objectives will be met taking into account the specific situation of each Member State. To ensure that the spatial data infrastructures of the Member States are compatible and usable in a Community and transboundary context, the Directive requires that common Implementing Rules (IR) are adopted in a number of specific areas. These IRs are adopted as Commission Decisions, and are binding in their entirety. The Commission is assisted in the process of adopting such rules by a regulatory committee composed by representatives of the Member States and chaired by a representative of the Commission (this is known as the Comitology procedure). The committee will be established within three months from the entry in force of the Directive.

IRs on metadata need to be adopted within one year of the entry in force of the Directive, i.e. by early March 2008. The Commission will make a proposal to the committee, which has three months to deliver its opinion. If the committee agrees with the proposal, the IR is adopted. If the committee does not agree, or does not deliver an opinion, then the Commission needs to submit the proposal to the Council and inform the European Parliament. If Parliament considers that the proposal submitted by the Commission exceeds the implementing powers provided for by the INSPIRE Directive, it informs the Council of its position. The Council votes by qualified majority on the proposal. If the Council agrees with the proposal or does not indicate opposition, the IR is adopted by the Commission. If the Council opposes the measure, the Commission will have to submit a revised proposal¹.

In order to prepare the Commission proposal, an international team of experts has been working since October 2005 to review available reference material and international standards to come to a draft proposal fulfilling the requirements of the Directive. This document represents a deliverable of the Drafting Team (DT) on Metadata, summarising the analysis of approximately² 120 documents submitted by Legally Mandate Organisations (LMOs) and Spatial Data Interest Communities (SDICs). These 'reference documents' were contributed as part of the process by which INSPIRE stakeholders are encouraged to provide input and feedback to the Implementation Rules drafting process.

The members of the Drafting Team (DT) and Support Team (ST) divided the evaluation workload according to competence and language skills, and each member reviewed a subset of the reference

¹ A precise explanation of the regulatory procedure to be used for the IR on metadata and monitoring measures is contained in Article 5 of Council Decision 1999/468/EC, amended by Decision 2006/512EC of the 17 July 2006. IR for the interoperability and harmonisation of spatial data sets and services, network services, and data sharing need to follow the regulatory procedure with scrutiny detailed in Art. 5a of the same Council Decision. See: <http://eur-lex.europa.eu/LexUriServ/site/en/consleg/1999/D/01999D0468-20060723-en.pdf>

² We say approximately 120 because some documents were found to be duplicates or very similar to others previously contributed.

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documents, some of which were websites or other multimedia rather than static documents per se. In an effort to standardise the evaluation process to some extent, evaluations followed a template containing 8 basic questions, that was designed during a previous consensus process within the DT and ST. The summary of responses to the 8 questions is found in section 7 of this document.

Several documents arrived late in the process, well after the announced deadline, but these were evaluated in the same manner.

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2 Purpose of the document

- This document serves to provide an overview of the DT evaluation process and its overall results.
- This document serves to maintain the public informed of the DT activities within the INSPIRE process.
- The document is published on the INSPIRE web site (www.ec-gis.org/inspire) as reference to analyse the main deliverable of the Drafting Team: the Draft Implementing Rules on Metadata (Deliverable 1.3, also available from the same web site)

The document will be publicly available as a 'non-paper', as it does not represent an official position of the Commission, and as such can not be invoked in the context of legal procedures.

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3 Summary of documents received

The SDICs and LMOs registered during the February-May 2005 timeframe were asked to submit documents to be considered in the Implementation Rules drafting process. The deadline for submitting material was originally set at the 29th April 2005. (Since then the process has been left open, for on-going submission of materials.) Initially 80 reference documents related to metadata were received and sent to the DT metadata for evaluation. Later on, however, another 40 documents arrived and be assigned to the DT.

Upon scrutiny it was found that some of the later contributions were in fact duplicates or were very similar to documents previously recorded and evaluated. This may have been caused by multiple contributors submitting documents, perhaps not realizing that colleagues had already done so. In other cases a general standards reference, for example the ISO application profile for CS-W 2.0, was submitted independently by two separate SDICs.

In several other cases multiple related documents were submitted, yet all pertaining to the same project.

All accounted for, it is estimated that about half of the contributions were found to be truly useful to the on-going DT metadata work, the others providing background and, above all, indicating the level of interest among LMOs and SDICs to contribute to the process. This level of interest is reflected, quantitatively not qualitatively, in figure 1 below.

Categorization

The reference materials were quite diverse, however a few categories may be easily identified:

- Versions or profiles (national or regional) of ISO 19115
- GI projects with direct relation to metadata issues and possible contributions
- General references from standards organizations (ISO, CEN)
- GI projects or database descriptions, with little relation to the DT metadata work
- International organization-based projects, some representing specific information communities
- References (URLs) to on-line materials which were inaccessible at the time of evaluation.

Contributions per member state

The member states contributing the greatest number of reference materials (not necessarily the most relevant) were:

1. Italy 20
2. France 15
3. Germany 7
4. Norway 7
5. UK 6

That said, a still higher number (36) of reference documents came from international SDIC/LMOs with no single member state affiliation.

On the other side, it is interesting and perhaps worth considering that 8 member states contributed only one document, and many others did not contribute any single reference material to the process.

See figure 1 for a breakdown of contributions per MS.

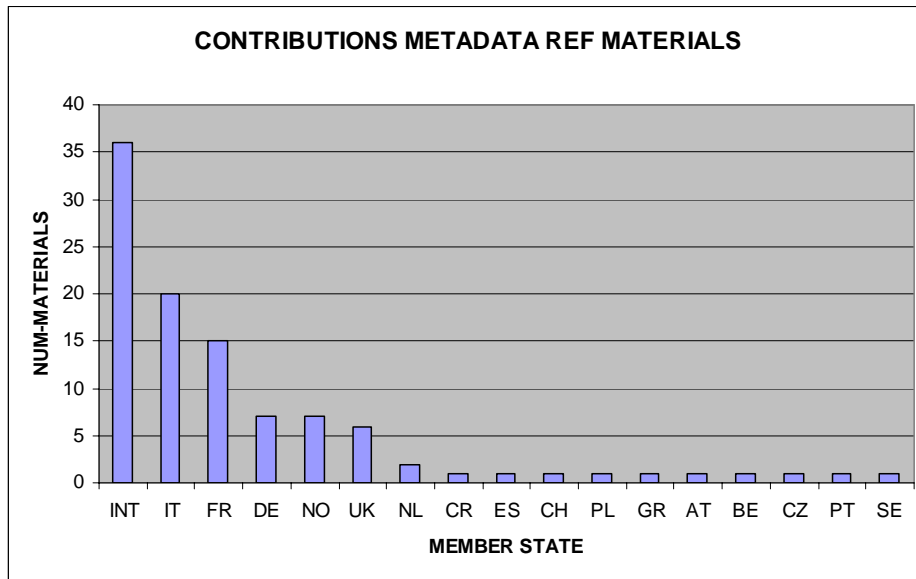


Figure 1. Reference materials contributed to the DT process, by member state (first category is international). The sample shown is of 103 materials after duplicates were eliminated.

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4 Problems experienced

As described earlier, the reference material evaluation process was more drawn out and laborious than anticipated. This was due to several factors:

- Materials arriving several weeks after the stated deadline
- Materials inaccessible due to the need to pay for a particular standards document (example document 61 IHO: "[IHO Presentation Library for ECDIS \(Publication S-52, Appendix 2, Annex A\)](#)", for which the main document is available only for a fee, and the free annex is not related to the topic of geo metadata)
- Materials inaccessible due to broken URLs or other web problems (i.e. password protection)
- Materials of possible qualitative value however not structured in a way in which they could be properly evaluated given the DT-designed evaluation template.

5 Summary of results

Overall results

As stated earlier, approximately half of the 100-plus reference materials contributed were found to be useful in the Metadata Drafting Team's analysis of the state-of-the-art in metadata creation and use by European stakeholders.

Although at first glance it might appear that there exists a huge variety of geospatial content metadata initiatives, standards, projects and recommendations, a more detailed analysis reveals a striking commonality among them. This common thread --connecting nearly all the regional and national projects described in the contributed reference materials-- is the application and profiling of a just a few international standards, primarily ISO 19115 and Dublin Core.

In terms of service metadata a similar level of commonality is found: application and profiling of ISO 19119, as well as initial implementations of OGC Catalog Service specifications such as CS-W 2.0.

The majority of the contributors were: a) international organisations related to production of data and metadata, and b) national data and metadata collection/provision agencies.

More specific and key thematic information communities, represented by international organisations such as the European Environment Agency (EEA) and the World Meteorological Organization (WMO), expressed their specific concerns regarding metadata collection and exploitation, and were considered in the DT analysis. In both cases, upon close scrutiny of ISO standards, and taking into consideration the profiling possibilities available, these information communities decided not to try to 'reinvent the wheel' and to try to harmonize their needs with the available international standards framework available. In the case of WMO, at the 27-29 September 2005 meeting in Beijing the harmonization process between ISO 19115 and WMO profile version 0.2, was presented by the Inter-programme expert team on metadata implementation.

While this DT analysis cannot pretend to be exhaustive, it does seem to have been indicative of the range of projects and initiatives being carried out by European GI provider organizations. The user community is less well covered although the relevant SDICs did contribute some material that was analysed.

Detailed results

In this section we present a summary of detailed results of the analysis of reference materials according to 8 key questions.

Reference materials were submitted to the INSPIRE process, published to an intranet, and then accessed and evaluated by the Metadata Drafting Team. Materials were analysed against a template (created earlier by the DT) containing 8 sections, each asking a basic question regarding the reference material. Here we summarise the results of each section in turn.

These results were presented (summarised) by the DT chairman, at the Inspire DT Coordination Meeting held 16-17 February 2006 at JRC (Ispra).

Template questions

1. Does the reference material comply with existing metadata standards, or define extensions to them?

- Of those reference materials that truly did address metadata, nearly all address the use of ISO 19115 for spatial data
 - Several profiles at regional and national (e.g. Italy, France, Spain) levels

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- No radical modifications to 19115 identified
- Metadata for data well developed, metadata for services is in early stages
- Metadata for services seems only well developed (based on the reference material) in Germany
- ISO 19119 is used for services
- Dublin Core (DC) is often used to supplement content metadata
 - Useful for connection between geo and e-government (general search)
 - In all cases analysed, an addition to ISO 19115 implementation (no DC-only implementations of metadata)
- Other standards: several mentions of ISO 19139 (XML encoding of ISO 19115)

2. Which requirements of the INSPIRE directive (as defined in art8 and art18) are covered?

- Standard ISO 19115 classes are applied to fulfill the INSPIRE directive requirements
- Where DC is used the DC classes are supplied

Points of interest:

- Defines list of “thematic-keywords”; not very extensive, mainly useful for discovery purposes
- Responsible parties: Uses special UDK “address-objects” to refer to persons and/or organizations
- List of used thesauri
- French extension on constraints

3. Does the reference document address spatial data, services, or both?

- The primary focus is clearly on spatial data, with only a few reference materials focusing on services (see conclusions answer 1)
- In all cases analyzed, services are described in combination with spatial data.

4. Does the reference define core metadata elements?

- Several materials do describe metadata core subsets of metadata elements. Most core sets are based on the ISO 19115 core.
- Some core sets are based on OGC core (=DC)
- Norwegian SDI defines thematic metadata core: may be of interest for INSPIRE
- WMO version 0.2 profile makes extensions to ISO 19115; none thought to be problematic with regard to interoperability; needs testing.
 - Differing viewpoints: ex. WMO defines new data type 007=irregular points, whereas many would consider this already covered by 001=vector

5. Does the reference document refer to thematic data? If yes, does it address INSPIRE Annexes I, II, and III?

- Some materials do refer to thematic data, however not as main focus.
- These references could be helpful in addressing use and evaluation
- Norwegian example mentioned in answer 4.

6. Does the reference document address multi-lingual and/or multi-cultural (in the sense of user-community-specific) aspects?

- One multi-cultural and several different multi-lingual solutions are found in the reference materials.
- WMO keywords in 4 languages (Eng,Fr,Span,Rus)

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- Multilingual solutions analyzed are in compliance with ISO 19115

7. Is the reference document a mature standard, well accepted and commonly used, or does it represent a recent proposal?

- Most materials analyzed describe on-going initiatives, not mature standards initiatives.
- These initiatives are, however, generally based upon mature standards such as ISO 19115 or DC.

8. Does the document present new and interesting ideas regarding metadata?

- The DT did not encounter major new ideas in the contributed reference materials.

Materials containing points of interest:

- Numbers 8, 41, 48, 60, 75, 88 and 98 (for example: OGC AP ISO 19115/19119, cataloguing issues, web services)

6 Appendix 1. List of reference materials contributed

Note: the material was contributed in many instances with restrictions on access beyond the drafting process. Parties interested in such material should contact the SDIC/LMO that contributed the material in the first instance.

Note in document numbering: missing documents represent duplicate contributions.

Last
update:

13/01/2006

Doc nr.	Reference material	SDIC/LMO
1	Common Data Index (CDI) - Metadata Format and full description XML schema	Sea-Search
3	Guide de mise en oeuvre de la norme expérimentale XP ENV 12657	CNIG-Conseil national de l'information géographique
4	Volet Information géographique du cadre commun d'interopérabilité entre systèmes d'information publics version 2.1	CNIG-Conseil national de l'information géographique
5	Brandenburger Metadatenprofil gemäß ISO 19115 (Metadatenelemente)	GIB
8	BookShop - Working document of analysis	Regione Emilia-Romagna
9	INTERLIS	Federal Office of Topography (Switzerland) - swisstopo
10	Departmental Geographical Information Strategies	Ordnance Survey
11	The Principles of Good Metadata Management	Ordnance Survey
12	Repository Manager	Regione Emilia-Romagna
13	Digital National Framework - White Paper	Ordnance Survey
14	GEOLOGICAL KNOWLEDGE AND DIGITAL GEOLOGIC MAPPING: HINTS DERIVED FROM CARG ACTIVITY	MAGGIS
16	SITAD-VISTA D'INSIEME	SITAD SP
17	SITAD-Specifica dei requisiti del sistema	SITAD SP
18	MANUALE UTENTE	SITAD SP
19	SITAD- Modello metadati	SITAD SP

20	SITAD- DEFINIZIONE DELL'ARCHITETTURA RELATIVA AL METADATO DI 2° LIVELLO PER I DATI CARTOGRAFICI	SITAD SP
21	SITAD-DEFINIZIONE DEL DB DEL CATALOGO METADATI	SITAD SP
22	Spatial Data National Catalog - Guidebook for implementing ISO 19115 Standard, Geographic Information - Metadata	SITAD SP
23	Atto di indirizzo e coordinamento tecnico per l'attuazione della L.R. 20 (Direttiva A-27)[in reference to "Disciplina generale sulla tutela e l'uso del territorio (L.R. 20, 24 marzo 2000)"]	Regione Emilia-Romagna
24	Multilingual European Subset of Unicode in Geospatial Data Encoding	PASI
25	DBTI (DataBase Territoriale Integrato): modello dati annex 3	SIGMA TER
26	DBTI (DataBase Territoriale Integrato): modello dati annex 2	SIGMA TER
27	DBTI (DataBase Territoriale Integrato): modello dati annex 1	SIGMA TER
28	DBTI (DataBase Territoriale Integrato): modello dati	SIGMA TER
29	Il progetto SIGMA TER: uno sguardo d'insieme	SIGMA TER
30	Route 120 descriptif de contenu	Institut Géographique National
31	Route 500 descriptif technique	Institut Géographique National
32	BD Carto Descriptif technique	Institut Géographique National
33	BD Carthage version 3.0 descriptif de contenu	Institut Géographique National
34	BD Topo version 3.1 descriptif technique	Institut Géographique National
35	BD Parcellaire version 1.1 descriptif technique	Institut Géographique National
36	BD Ortho version 2 descriptif de contenu	Institut Géographique National
37	BD Nyme descriptif technique	Institut Géographique National
38	BD Adresse descriptif technique	Institut Géographique National
39	BD Alti Descriptif technique	Institut Géographique National
40	SITR	SITR

41	UDK Metadata Model Version 5.08	Coordination Center UDK/GEIN (KUG)
42	Link list to documents relating to: Framework for the WMO Information System	GRDC
43	Development of the WMO Core Profile of the ISO Metadata standard	GRDC
44	metadata and network services	HELLENIC MAPPING AND CADASTRAL ORGANIZATION
46	NATURE-GIS Guidelines: Data Infrastructure for Protected Areas	NATURE-GIS
47	SPIN Reports and Deliverables	NATURE-GIS
48	OpenGIS® Catalogue Services Specification 2.0 - ISO19115/ISO19119 Application Profile for CSW 2.0	Lenkungsgrremium GDI-DE (Steering Committee GDI-DE) (explanation: GDI-DE = Spatial Data Infrastructure Germany)
49	Documentation on the Modelling of Geoinformation of Official Surveying and Mapping (GeoInfoDok)	Lenkungsgrremium GDI-DE (Steering Committee GDI-DE) (explanation: GDI-DE = Spatial Data Infrastructure Germany)
50	Updating models for sets of spatial reference data (Datenfuehrungsmodelle)	Federal Office of Metrology and Surveying (BEV)
51	Common spatial reference data at Lake Constance	CON2
52	CLIMATE SCIENCE MODELLING LANGUAGE: STANDARDS-BASED MARKUP FOR METOCEAN DATA	ATMOS-DMC
54	Institute of Spatial and Cadastral Systems Documentation	NATURE-GIS
55	NATURA 2000: Identification & GIS Classification of Flora Habitants in Significant Reservation Areas: Greece	NATURE-GIS
56	GDI NRW Specification Profiles	GDI NRW
57	Metadata management system - MetaWAL	CTC-RW
58	Report of the benchmark study on data management in SABE update processes at CUZK/ZU/VUGTK in the Czech Republic	NATURE-GIS

59	SS 63 70 07 (draft) Geographic information – Representation of changes in datasets	Stanli
60	SS 63 70 08 (draft) Geographic information - Surface water systems - Conceptual model and Application schema	Stanli
61	IHO Presentation Library for ECDIS (Publication S-52, Appendix 2, Annex A)	IHO
62	IHO Transfer Standard for digital Hydrographic Data (Publication S-57)	IHO
63	EuroGeographics Reference Material	EuroGeographics
64	MIG Editor - Editor for geographic Information Metadata version 1.0	Instituto Geográfico Português
65	Development of a morphodynamic indicator for sub-regional ICM	GI-CLAN
66	GISEE Final Report	AGISEE
67	Proposal for Official Map Protection of Croatia	AGISEE
68	ICZMap - Data Research Project	United Kingdom Hydrographic Office
69	EEA Metadata Standard for Geographic Information	EIONET
70	EUREF Publication No.13	EUREF
71	EUREF Publication No. 1 – 13	Bundesamt für Kartographie und Geodäsie (BKG)
72	Specifications for GeoPortal.Bund	Bundesamt für Kartographie und Geodäsie (BKG)
74	SDIC_Statistics	SDI_Statistics
75	Program of Indicators of sustainability	Institut d'Aménagement et d'Urbanisme de la Région d'Ile-de-France-Paris
76	Program of Indicators of sustainability	Institut d'Aménagement et d'Urbanisme de la Région d'Ile-de-France-Paris
77	GIS Guidance document	WISE GIS
81	AP ebRIM of CSW 2.	Drafting Team
82	CEN TR_00287030-1__E__200509270655.pdf	Drafting Team
83	cwa14856-00-2003-Nov.pdf	Drafting Team
86	EEA-MSGI_v1_1a.doc	Drafting Team

87	EuroGeographics EuroMapFinder specification	Drafting Team
88	French Profile of ISO 19115	Drafting Team
89	ISO 15836 - Dublin Core	Drafting Team
90	MGCP Metadata Specification	Drafting Team
91	mmidc137.pdf	Drafting Team
92	mmidc143.pdf	Drafting Team
93	mmidc144.pdf	Drafting Team
94	mmidc145v1.pdf	Drafting Team
95	mmidc147.pdf	Drafting Team
96	mmidc148.pdf	Drafting Team
98	OGC CSW 2.0	Drafting Team
99	Progetto "Catalogo delle fonti di dati ambientali in Friuli Venezia Giulia a supporto della valutazione di impatto amb	Drafting Team
100	proposed_version_0-2_draft_WMO_Core_Profile.doc	Drafting Team
101	Repertorio Nazionale dei Dati Territoriali	Drafting Team
103	UK_GEMINI_v1.pdf	Drafting Team
104	WMO_metadata_standard_keywords.xls	Drafting Team
105	Geographic Information: An analysis of interoperability and information sharing in the United Kingdom	Ordnance Survey
106	SITAD-VISTA D'INSIEME	SITAD SP
107	Report on NMCAs Capabilities in Web Services Provision	EuroGeographics
108	EuroSpec service architecture	EuroGeographics
109	Digital Norway - The Norwegian government's initiative to build the national geographical infrastructure	ND
110	Norway digital – geographic information as a common fundament for value-adding by public and private sector (white paper)	ND
111	geoNorge.no – The New Norwegian geoPortal - An implementation of a geoPortal using Arc_IMS Portal toolkit	ND
112	geonorge.no - the Norwegian geoPortal	ND

113	DBTI (DataBase Territoriale Integrato): modello dati annex 1	SIGMA TER
114	Il progetto SIGMA TER: uno sguardo d'insieme	SIGMA TER
115	DBTI (DataBase Territoriale Integrato): modello dati	SIGMA TER
116	DBTI (DataBase Territoriale Integrato): modello dati annex 2	SIGMA TER
117	DBTI (DataBase Territoriale Integrato): modello dati annex 3	SIGMA TER
118	eNorway 2009 – the digital leap	ND
119	Norwegian metadata guidance document and web site	ND
120	Núcleo Español de Metadatos (NEM v1.0)	IDEA Working Group of the Commission on Geomatics (National Geographic High Council)