Metadata Guidelines for Geospatial Data Resources - Part 2

Creating metadata using UK GEMINI2 (v2.2)

April 2015

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Update history

Version	Date	Author	Status
2.1	2010-08-08	R S Walker	Published version of Guidelines corresponding to GEMINI2.1
2.2	2015-04-18	R S Walker	Amended to correspond to GEMINI2.2

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Preface

This is the second part of a set of guidelines for metadata for geospatial data resources. These metadata guidelines are primarily concerned with geospatial data (i.e. that which references data to a location on the surface of the Earth), and which has a limited geographic extent (i.e. is restricted to a defined territory). The guidelines have been developed within the context of a UK Location Discovery metadata service meeting the requirements of the EU INSPIRE Directive and the UK GEMINI2 metadata standard. However, they are sufficiently broadly based to be applicable in a wider context of geospatial metadata creation and management.

The Guidelines are aimed at data managers and creators of metadata, providers of metadata services and general data users. They include guidance on quality management such that they could be used in the context of a national metadata service.

Part 1 of the Guidelines covers the basics of metadata and provides an introduction to the other two parts. It includes a glossary of terms and set of references. Part 3 deals with metadata quality and covers quality evaluation and quality management of metadata including guidance on establishing acceptable quality levels. This Part of the Guidelines provides a set of detailed guidelines for UK GEMINI2 metadata elements. It has been revised to correspond to version 2.2 of UK GEMINI.

Any comments on these guidelines or on the UK GEMINI2 metadata standard should be sent to gemini@agi.org.uk.

1. INTRODUCTION

UK GEMINI2 defines a core set of metadata elements for discovery of data resources and other essential purposes. It provides details of what metadata should be collected for geospatial data resources and is designed for use in a geospatial discovery metadata service. The data resources may be datasets, dataset series, services delivering geographic data, or any other information resource with a geospatial content. This includes datasets that relate to a limited geographic area. The data resources may be graphical or textual (tabular or free text), hardcopy or digital.

This part of the *Metadata Guidelines for Geospatial Data Resources* provides detailed guidance for the application of UK GEMINI2. It is aimed at those creating metadata conforming to UK GEMINI2. This expands on existing guidance given in the UK GEMINI2 specification[1]. It also describes possible errors that might occur in such metadata and suggests actions to guard against them. It explains how to expand the metadata elements in addition to those in UK GEMINI2 if required, and how to extend code lists of allowable values.

This Part should be read in conjunction with the other parts if these guidelines.

[1] UK GEMINI Standard v2.2, available from www.agi.org.uk/uk-gemini

2. GEMINI2

2.1 Metadata elements

UK GEMINI2 specifies a set of 30 metadata elements for describing geospatial data resources. These resources may be a dataset, data set series (collection of datasets with a common specification) or data service. The type of resource is identified in the element Resource Type (39). The metadata elements are as follows:

Element number	Element name	Multiplicity‡	Obligation†	
			datatsets & dataset series	services
1	Title	1	M	M
2	Alternative title	N	O	O
3	Dataset language	N	C	C
4	Abstract	1	M	M
5	Topic category	N	M	O
6	Keyword	N	M	M
7	Temporal extent	N	M	C
8	Dataset reference date	N	M	M
10	Lineage	1	M	O
15	Extent	N	O	O
16	Vertical extent information	1	O	O
17	Spatial reference system	N	O	O
18	Spatial resolution	N	C	C
19	Resource locator	N	C	C
21	Data format	N	O	O
23	Responsible organisation	N	M	M
24	Frequency of update	1	O	O
25	Limitations on public access	N	M	M
26	Use constraints	N	M	M
27	Additional information source	1	O	O
30	Metadata date	1	M	M
33	Metadata language	1	C	C
35	Metadata point of contact	N	M	M
36	Unique resource identifier	N	M	O
37	Spatial data service type	1	-	M
38	Coupled resource	N	-	M
39	Resource type	1	M	M
41	Conformity	N	C	C
43	Equivalent scale	N	O	O
44	Bounding box	N	M	C

Note.
‡ '1' implies that only one value may be provided, and 'N' that multiple values may be provided.
† 'M' indicates that the element is mandatory, 'C' that it is conditional, and 'O' that it is optional.

Annex A provides detailed guidance on how to create each of these elements. Each element is the subject of a separate table.

2.2 Additional metadata elements

In many organisations, there is a need to record additional items of metadata to meet specific local requirements. This may be to incorporate particular characteristics of the data resources, or for particular applications. Additional metadata elements may be included in a metadata implementation. These elements should be taken from ISO 19115 *Geographic information - Metadata*, which includes a comprehensive collection of metadata elements for geographic information. An example would be Dataset character set and Metadata character set where non-standard characters are used.

2.3 Extension of code lists

Several of the metadata elements specified in UK GEMINI2 use enumerated code lists. These are pre-defined sets of values identified by codes. They are useful to standardise the entries to aid searches of metadata for specified values. The code lists included in UK GEMINI2 are taken from ISO 19115. In some cases, the explanations of the values have been modified to make them more appropriate to the UK context.

Some of these code lists will require extension. Additional codes may be created as follows:

1. identify the new value, which should be distinct from existing values;
2. chose a name that encapsulates the essential concept;
3. provide a definition that is understandable and concise;
4. chose a new code that has not been used before for this element;
5. document the new codes, and disseminate them to users.

Such code extensions may be either specific to a metadata implementation in an organisation or sector, or for general usage. In the latter case, proposed new codes should be submitted (to gemini@agi.org.uk) for inclusion in the next version of UK GEMINI2. It is expected that future editions of UK GEMINI will incorporate such modified code lists. **Note that any new code values cannot be used in a national metadata service until incorporated in the Standard, neither will they be valid for the purposes of INSPIRE.**

3. POSSIBLE METADATA ERRORS

3.1 Impact of metadata errors

Errors having the greatest impact are likely to be those that affect searches based on:

- Where? - geographical extent expressed in latitude and longitude or some named standard area (e.g. administrative area, postcode, country);
- What? - theme, subject or topic;
- When? - date when data resource was current.

Errors in the metadata elements used by these searches will result in over- or under-selection of data resources and will degrade the quality of the discovery service that is providing the search facility. Inconsistencies in the capture or updating of metadata, such as the categorisation of data subject or topic, will further erode the quality of the discovery service.

3.2 Effect on searches

Having discovered a number of candidate data resources, the discovery service user then assesses the likelihood that any of these meet their requirements. They will need the information in the other metadata elements such as abstract, lineage, data format, and constraints to make their assessment. Inaccuracies, inconsistencies, or incompleteness will detract from the quality of the discovery service.

Information also needs to be topical or up-to-date. Discovery services are bedevilled by metadata containing information current at the inception of the service but never maintained since. The service user needs to have reliable information about where they can find out more about the data resource and how they can obtain that resource. It is not uncommon for this to be out-of-date or have incorrect URLs or contact details.

3.3 Prevention and correction of errors

Prevention and correction of these errors is usually a combination of:

- understanding the nature of the errors;
- clear guidance on avoidance of errors at time of entry – metadata capture tools may help here in validating entries;
- staff trained in metadata capture who understand the nature of the data resources being documented;
- independent quality control with specified quality evaluation procedures, acceptable quality levels and procedures for dealing with metadata that fails;
- periodic reviews of existing metadata to check that all information is current;
- procedures for dealing with errors reported by service providers or users;
- overall quality assurance process which reviews procedures in the light of experience and aims to improve overall metadata quality.

Further guidance on how to prevent and correct errors is given in Part 3 of these Guidelines.

3.4 Common errors

Some common errors that lead to inconsistent results when searching across metadatasets are:

- Documentation is too general;
- Extent is over-generalised;
- Subjects and topic categories are under-reported;
- Incorrect or inconsistent date entries;
- Different names are used for the same item in different places;
- Missing values;
- Data is not current.

The nature and impact of these types of error are described in more detail in Table 1, together with suggested ways in which these errors can be prevented or corrected.

Other errors that may lead to misinterpretation of results are:

- Correct value, but for the wrong metadata element;
- Values incorrect, incomplete or inaccurate;
- Incomprehensible, misleading or uninformative entries.

The nature and impact of these types of error are described in more detail in Table 2, together with suggested ways in which these errors can be prevented or corrected.

Table 1. Some common errors leading to inconsistent results when searching across metadatasets

Type of error	Description and impact	Examples of errors	Prevention or correction
Documentation too general	There are no absolute rules about how data resources should be "chunked" and individually documented. A metadata record can therefore refer to a dataset covering a single topic relating to a small area or major dataset series covering all or parts of UK containing many topics. This can lead to inconsistent search results with either over- or under-selection of data resources.	1. Topographic mapping covering whole of GB at different scales to different specifications documented using one metadata record. 2. Reports produced by an organisation relating to a variety of locations and dates documented using one metadata record.	Have clear guidance on the "chunking" of data resources for individual documentation[2] based on: (i) how the data is used (stand-alone or as part of wider set); (ii) continuity and extent of coverage; (iii) date of capture or maintenance; (iv) topics or subjects covered, and (v) uniformity of specification within data resource. Introduce checks to ensure consistency of approach across all metadata.
Extent over-generalised	This particularly applies when extent is described in terms of standard geographical areas such as postcode districts, counties, or countries. Inconsistencies in relating data resource coverage to these areas and the use of different extent names to refer to the same coverage results in either over- or under-selection of data resources.	1. Coverage given as UK or GB when restricted to England. 2. Coverage of UK referred to as GB. 3. Coverage given as England when restricted to Hampshire only.	Have clear rules and user guidance on the relating of named extents to the coverage of data resources and guidelines on the types of extents to be used. Where named extents form part of a nesting hierarchy (e.g. administrative areas) then any guidance should cover the possible need for inclusion of levels in the hierarchy. Introduce checks to ensure consistency of approach across all metadata.

[2] See 3.4 and Table 1 of Part 1 if these Guidelines

Type of error	Description and impact	Examples of errors	Prevention or correction
Subjects and topic categories under-reported	This particularly applies where there are enumerated lists of topics. Inconsistency in the inclusion of individual topics can lead to over- or under-selection of data resources.	Metadata for topographic map series does not include boundaries, elevation, inland waters, structure, and transportation as topics.	Use guidance on the recording of topics or themes to promote consistency. Use closed lists wherever possible and discourage the use of free text. Introduce checks to ensure consistency of approach across all metadata.
Incorrect or inconsistent date entries	There is often confusion between the date that the data was current, the date when the data was captured or last updated and the date when the data resource was released, published or made available. There can be further inconsistencies between the frequency of update and the recorded currency of the data resource. This can lead to false returns for searches based on dates.	1. Date of capture of data resource later than date of publication. 2. Update reported as continuous but date of last update reported as 10 years ago.	Use guidance on the recording of different dates to promote consistency. Introduce checks, preferably by software, to ensure that the ordering of dates is consistent.
Same item, different name	This is particularly relevant where there is no closed list but a name or descriptor recurs which is common to many metadatasets. This may lead to inconsistent results or, more frequently misinterpretation of results.	National Grid, British National Grid, National Grid of Great Britain.	Include frequently used standard names in any internal guidance. Introduce checks to ensure consistency of approach across all metadata.
Missing values	Omission of values relating to extent, date or topic will have great impact on searches since these are the usual criteria used.	1. Omission of geographical extent. 2. Omission of dataset reference date. 3. Missing topic categories.	Introduce checks, preferably software checks, to ensure that mandatory fields contain values.

Type of error	Description and impact	Examples of errors	Prevention or correction
Information not current	This can impact both on searches and the interpretation of search results since the metadata does not reflect the current information or only does so partially.	1. Content of data resource extended but no change to topic categories. 2. Abstract not updated to reflect change of specification. 3. Data resource updated but later date not entered in the metadata.	Introduce a regime of regular checks on all metadata to ensure that currency is assessed and updates made where needed.

Table 2. Other errors leading to misinterpretation of results

Type of error	Description and impact	Examples of errors	Prevention or correction
Correct value, wrong metadata element	Confusion between the definitions of metadata elements can lead to correct values entered against the wrong metadata element.	1. Lineage information given for abstract. 2. Limitations on public access given for use constraints.	Use guidance on the definition and use of the metadata elements especially those most commonly confused (see examples). Introduce training and checks to ensure correct use of elements.
Values incorrect, incomplete or inaccurate	This can apply to both quantitative and non-quantitative entries and can impact on the way that results are interpreted and used.	1. URL given as additional information source incorrect and not accessible. 2. Contact details for obtaining data resource are incorrect.	Check values are correct as far as can be established e.g. independently check URLs, contact details.
Incomprehensible, misleading or uninformative entries	Entries need to be understandable by the discovery service user who needs to interpret the search results. The impact can be that results are misinterpreted and candidate datasets ignored.	1. Where dataset does not have a recognised title, uninformative title given. 2. Abstract is uninformative with no information on content. 3. Lineage contains no information about sources or reasons for creation. 4. Use of terms and abbreviations unlikely to be understood by service user.	Use guidance and checklists for compiling entries e.g. abstracts.

Annex A. Guidance for individual metadata elements

This Annex provides detailed guidance on how to create each of these elements. Each element is the subject of a separate table. The tables contain the following:
Metadata element name – name of the UK GEMINI2 element;

- Definition – the formal definition of the element, as given in UK GEMINI2;
- Purpose and meaning – an explanation of what the element is and why it is required;
- Obligation – whether the element is mandatory, optional or conditional (with the condition for inclusion);
- Occurrence – whether the element is single-valued or can have multiple values;
- Data type – the form of the entry, whether it is a character string, real number, integer, code or other class (where the data type is another class, it is implemented as an additional set of elements);
- Domain – the allowable set of values;
- Rules for how to fill in the entry – advice on how to complete the entry;
- Examples – example entries;
- Other comments – any other information of relevance.

A.1 Title

Metadata element name	Title
Definition	name given to the data resource
Purpose and meaning	The purpose of this element is to provide a readily recognisable name for the data resource.
Obligation	mandatory
Occurrence	single
Data type	character string
Domain	free text
Rules for how to fill in the entry	1. The title should be the formal or product name for the data resource, if existing. 2. If no name exists, then a title should be created that is short, encapsulates the subject, temporal and spatial coverage of the data resource, and does not contain terms or jargon that make it incomprehensible.
Examples	OS MasterMap® Topography Layer Voter participation in Liverpool local elections, 1994, by ward
Other comments	-

A.2 Alternative title

Metadata element name	Alternative title
Definition	short name, other name, acronym or alternative language title for the data resource
Purpose and meaning	The purpose of this element is to record any alternative titles by which the data resource is known.
Obligation	optional
Occurrence	multiple
Data type	character string
Domain	free text
Rules for how to fill in the entry	1. There is no need to fill in this entry unless there are other names used for the dataset, for example historic names. 2. Commonly used abbreviations or acronyms should be recorded. 3. Other language equivalents should be recorded where they exist, for example the Welsh language title (although this title may refer to a different data resource). 4. Entries should be short and concise.
Examples	OS large-scale data
Other comments	-

A.3 Dataset language

Metadata element name	Dataset language
Definition	language used in the data resource
Purpose and meaning	This is the written language used for any text in the dataset.
Obligation	conditional – data resource contains textual information
Occurrence	multiple
Data type	character string
Domain	free text
Rules for how to fill in the entry	A code should be selected from ISO 639-2 which uses three-letter primary tags with optional subtags. The commonly used codes for the UK are: English eng Welsh cym Gaelic (Irish) gle Gaelic (Scottish) gla Cornish cor Ulster Scots sco Other official European languages are: Bulgarian bul Czech cze Danish dan Dutch dut Estonian est Finnish fin French fre German ger Greek gre Hungarian hun Italian ita Latvian lav

	Lithuanian lit Maltese mlt Polish pol Portuguese por Romanian rum Slovak slo Slovenian slv Spanish spa Swedish swe In many cases, a default value of eng can be applied.
Examples	cym
Other comments	1. If there is no textual information in the data resource, then it is recommended that a nil value should be recorded. 2. ISO 639-2 allows either cym or wel for Welsh, but two values for the same language causes confusion, and it is recommended that cym be used.

A.4 Abstract

Metadata element name	Abstract
Definition	brief narrative summary of the data resource
Purpose and meaning	The abstract should provide a clear and concise statement that enables the reader to understand the content of the dataset.
Obligation	mandatory
Occurrence	single
Data type	character string
Domain	free text
Rules for how to fill in the entry	1. State what the 'things' are that are recorded. 2. State the key aspects recorded about these things. 3. State what form the data takes. 4. State any other limiting information, such as time period of validity of the data. 5. Add purpose of data resource where relevant (e.g. for survey data). 6. Aim to be understood by non-experts. 7. Do not include general background information. 8. Avoid jargon and unexplained abbreviations.
Examples	Sites of Special Scientific Interest in Wales, classified by habitat type, with the limit of each SSSI recorded as a polygon, as at 2001-06-30.
Other comments	-

A.5 Topic category

Metadata element name	Topic category
Definition	main theme(s) of the data resource
Purpose and meaning	The purpose of this element is to provide a basic classification for the data resource for use in initial searches
Obligation	mandatory when the data resource is a dataset or dataset series
Occurrence	multiple
Data type	class
Domain	enumeration MD_TopicCategory Code from ISO 19115 (see below)
Rules for how to fill in the entry	Select one or more categories that most closely represent the topic of the data resource. If in doubt, go by the topic categories rather than the examples. It is not necessary to include all categories which may be applicable, but only a limited number of most relevant should be chosen (e.g. topographic maps should not be classified as farming).
Examples	location
Other comments	For greater detail within a topic, use the element ‘Keyword’

MD_Topic Category

Name	Domain code	Definition
farming	001	rearing of animals and/or cultivation of plants Examples: agriculture, plantations, herding, pests and diseases affecting crops and livestock
biota	002	flora and/or fauna in natural environment Examples: wildlife, vegetation, biological sciences, ecology, sea-life, habitat
boundaries	003	legal land descriptions Examples: political and administrative boundaries
climatologyMeteorology Atmosphere	004	processes and phenomena of the atmosphere Examples: weather, climate, atmospheric conditions
economy	005	economic activities, conditions and employment Examples: production, labour, revenue, commerce, industry
elevation	006	height above or below sea level Examples: altitude, bathymetry, digital elevation models, slope
environment	007	environmental resources, protection and conservation Examples: environmental pollution, waste storage and treatment, environmental impact assessment, monitoring environmental risk, nature reserves, landscape
geoscientificInformation	008	information pertaining to earth sciences Examples: geophysical features and processes, geology, minerals, soils
health	009	health, health services, human ecology, and safety Examples: disease and illness, factors affecting health, health services
imageryBasemapsEarth Cover	010	base maps Examples: land cover, topographic maps, imagery, unclassified images
intelligenceMilitary	011	military bases, structures, activities Examples: barracks, training grounds, military transportation
inlandWaters	012	inland water features, drainage systems and their characteristics Examples: rivers, salt lakes, dams, floods, water quality, hydrographic charts
location	013	positional information and services Examples: addresses, geodetic networks, control points, postal zones and services, place names
oceans	014	features and characteristics of salt water bodies (excluding inland waters) Examples: tides, tidal waves, coastal information, reefs
planningCadastre	015	information used for appropriate actions for future use of the land Examples: land use maps, zoning maps, cadastral surveys, land ownership
society	016	characteristics of society and cultures Examples: settlements, anthropology, archaeology, education, demographic data, recreational areas and activities, social impact assessments, crime and justice, census information
structure	017	man-made construction Examples: buildings, museums, churches, factories, housing, monuments, shops
transportation	018	means and aids for conveying persons and/or goods Examples: roads, airports/airstrips, shipping routes, tunnels, nautical charts, vehicle or vessel location, aeronautical charts, railways
utilitiesCommunication	019	energy, water and waste systems and communications infrastructure and services Examples: sources of energy, water purification and distribution, sewage collection and disposal, electricity and gas distribution, data communication, telecommunication, radio

A.6 Keyword

Metadata element name	Keyword
Definition	topic of the content of the data resource
Purpose and meaning	The purpose of this element is to indicate the general subject area of the data resource using keywords. This enables searches to eliminate resources that are of no interest. Ideally, a standardised set of keywords should be used, so that resources can be identified in any search. This element is similar to Topic, which has a coded list of high-level categories, whereas Keyword allows more appropriate terms to describe the data resource.
Obligation	mandatory
Occurrence	multiple
Data type	class
Domain	This class comprises the following elements: • keyword value (mandatory) • originating controlled vocabulary (conditional – if keywords originate from a controlled vocabulary)
Rules for how to fill in the entry	1. Keyword values should if possible be taken from a list of standard subject categories, and terms covering the subject of the data resource should be selected. 2. Possible vocabularies are the UK Integrated Public Sector Vocabulary (IPSV)[3] from the esd-toolkit, which should be used by public sector bodies, or the General Environmental Multi-Lingual Thesaurus (GEMET[4]). A default value will generally be assigned for this. 3. For conformance with INSPIRE: • for spatial datasets or spatial dataset series the keyword should describe the relevant INSPIRE spatial data theme, contained in GEMET; • for spatial data services it should at least define the category or sub-category of the service using its language neutral name as defined in Part D.4 of the Metadata Implementing Rules[5].

[3] see www.esd.org.uk/standards/ipsv/

[4] see www.eionet.europa.eu/gemet

[5] Commission Regulation (EC) No 1205/2008 of 3 December 2008 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards metadata, see http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32008R1205:EN:NOT

	4. The formal citation for the vocabulary should be given, including the date and version where appropriate, and details of any amendments.
Examples	Land cover, General Environmental Multi-Lingual Thesaurus (GEMET) Gazetteer service, General Environmental Multi-Lingual Thesaurus (GEMET)
Other comments	1. Other standard subject category areas may be used, and different user communities may need to create their own lists of subject areas. 2. Multiple keywords may be stored in an individual metadata record, and these may come from more than one originating controlled vocabulary.

A.7 Temporal extent

Metadata element name	Temporal extent
Definition	date for the content of the data resource
Purpose and meaning	This is the date or date range that identifies the currency of the data. It may refer to the period of collection, or the date at which it is deemed to be current.
Obligation	mandatory for datasets and dataset series conditional for services – where a temporal extent is relevant to the service
Occurrence	multiple
Data type	date
Domain	Date, or two dates defining the duration of the period, as defined by BS ISO 8601[6]. Periods are recorded as (fromdate/todate). Either fromdate or todate (but not both) may be left blank to indicate uncertainty. The extended date format (YYYY-MM-DD) should be used, where YYYY is the year, MM is the month and DD is the day. Time (HH:MM:SS, where HH is the hour, MM the minutes and SS the seconds) may be added if required, separated from the day by 'T'.
Rules for how to fill in the entry	Dates may be to any degree of precision, from century (YY) to full date and time.
Examples	2001-01-01 2009-05-02T09:10:01 1939/1945 /2003-03-31 2000/ 19
Other comments	1. If the data resource relates to a historic period, then this is part of the subject, e.g. "cretaceous period". In this case the date is the date of discovery or observation. 2. This element should not be confused with Dataset reference date which is an identifying date for the data resource.

[6] ISO 8601 Data elements and interchange formats – Information interchange – Representation of dates and times

A.8 Dataset reference date

Metadata element name	Dataset reference date
Definition	reference date for the data resource
Purpose and meaning	Dataset reference date is an identifying date for the data resource. It is a notional date of "publication" of the resource. It is different from Temporal extent which is the actual date of the currency of the data. For example, an atlas might have the reference date '2009', but the data will have been collected over a period prior to this.
Obligation	mandatory
Occurrence	multiple
Data type	class
Domain	This class comprises two elements: • date as defined by BS ISO 8601; • date type (publication/revision/creation). The extended date format (YYYY-MM-DD) defined in BS ISO 8601 should be used, where YYYY is the year, MM is the month and DD is the day. It may be extended to include time (HH:MM:SS), where HH is the hour, MM the minutes and SS the seconds, with the two parts separated by the character 'T'.
Rules for how to fill in the entry	1. The date should be completed to a resolution sufficient to identify the version. Thus if the data resource is updated annually, only a year is required, whilst if it is updated weekly, a day is required. 2. Identify whether date refers to creation, last revision or publication. 3. If the resource is continuously updated or is a dataset series (e.g. a map series), then a notional current date should be provided at a suitable level of resolution.
Examples	2001, publication 2005-05, publication 1997-10-01, publication 2009-05-02T09:10:01, publication
Other comments	-

A.9 Lineage

Metadata element name	Lineage
Definition	information about the events or source data used in the construction of the data resource
Purpose and meaning	The purpose of this element is to give an indication of how the data resource was created. It is useful in determining its fitness for purpose.
Obligation	mandatory for datasets and dataset series
Occurrence	single
Data type	character string
Domain	free text
Rules for how to fill in the entry	Include statements on the following: • source material; • process used to create the data. including resolution of measurement; • method of updating; • any quality control processes.
Examples	Addresses are taken from the Postcode Address File (PAF) and the property found on the large-scale Ordnance Survey map. The coordinates of an approximate centroid for the property are recorded to a resolution of 1 metre. The dataset is updated from the PAF monthly updates. All results are checked by plotting a group of related addresses on the map and visually checking for errors.
Other comments	1. Further details included in an external file may be referenced under 'Additional information source'. 2. This element is similar to Abstract, and some information may be included in either element.

A.10 Extent

Metadata element name	Extent
Definition	extent of data resource
Purpose and meaning	This element defines the geographical extent of coverage of the data resource relative to an administrative hierarchy. It enables searches to be carried out to find data relevant to the area of interest. Extent polygons can be implied through reference to an external gazetteer. Note that Extent is the coverage of the data resource, not the individual objects in the data resource. Thus if the data resource was national parks in England, the Extent would be 'England', even though many parts of England do not have National Parks.
Obligation	optional
Occurrence	multiple
Data type	class
Domain	The class comprises two elements: • authority code (optional) • identifier of extent
Rules for how to fill in the entry	1. An area approximating to the extent of coverage of the data resource should be chosen. This should not be over-generalised (i.e. do not take it as Great Britain if it only covers England and Wales). 2. Where the extent of the dataset does not coincide with any defined area or areas, then either the nearest equivalent including the area of coverage, or a set of multiple areas that make up the coverage should be provided.
Examples	England East Anglia The Wash
Other comments	-

A.11 Vertical extent information

Metadata element name	Vertical extent information
Definition	vertical domain of the data resource
Purpose and meaning	The purpose of this element is to describe the vertical range of the data resource (where relevant).
Obligation	optional
Occurrence	single
Data type	class
Domain	This class comprises three elements: 1. minimum value 2. maximum value 3. coordinate reference system
Rules for how to fill in the entry	See separate entries for each element.
Examples	-
Other comments	This is rarely used. It should be used only where vertical extent is significant, e.g. in geology, mining, meteorology etc.

Details of the three elements are given in the following tables.

Metadata element name	minimum value
Definition	lowest vertical extent contained in the data resource
Purpose and meaning	The purpose of this element is to describe the lowest vertical extent of the data resource.
Obligation	mandatory
Occurrence	single
Data type	real
Domain	real number
Rules for how to fill in the entry	Identify approximate lowest vertical extent in the specified coordinate reference system.
Examples	-100.0
Other comments	-

Metadata element name	maximum value
Definition	highest vertical extent contained in the data resource
Purpose and meaning	The purpose of this element is to describe the highest vertical extent of the data resource.
Obligation	mandatory
Occurrence	single
Data type	real
Domain	real number
Rules for how to fill in the entry	Identify approximate highest vertical extent in the specified coordinate reference system.
Examples	0.0
Other comments	-

Metadata element name	coordinate reference system

Definition	vertical coordinate reference system to which the maximum and minimum values are measured
Purpose and meaning	The purpose of this element is to describe the coordinate reference system used for the vertical extent measurements.
Obligation	mandatory
Occurrence	single
Data type	class
Domain	The class comprises two elements: • authority code (optional) • identifier of the coordinate reference system
Rules for how to fill in the entry	Identify coordinate reference system used for the vertical extent measurements. This should be recorded as a name or as a code, for example as provided by the OGP Surveying and Positioning Committee[7]
Examples	height in metres above Newlyn Datum
Other comments	-

[7] See www.epsg-registry.org

A.12 Spatial reference system

Metadata element name	Spatial reference system
Definition	name or description of the system of spatial referencing, whether by coordinates or geographic identifiers, used in the data resource
Purpose and meaning	The purpose of this element is to identify the way in which the data is spatially referenced in the data resource. This may be by coordinates (e.g. the National Grid of Great Britain) or geographic identifiers (e.g. unit postcodes).
Obligation	Optional, but should be provided where relevant
Occurrence	single
Data type	class
Domain	The class comprises two elements: • authority code (optional) • identifier of the spatial reference system
Rules for how to fill in the entry	Identify the spatial reference system used in the resource. Where there appears to be more than one spatial reference system used, take the one that is used in resolving any conflict between the spatial referencing systems (e.g. if the data is recorded referenced by unit postcodes, and a coordinate is then associated, then 'unit postcode' is the spatial reference system, whereas if the data is recorded by coordinate, and unit postcodes are added as an attribute, then it is 'National Grid of Great Britain').
Examples	National Grid of Great Britain
Other comments	Note that the data resource may be supplied in a range of other reference systems in addition to that in which it is recorded.

A.13 Spatial resolution

Metadata element name	Spatial resolution
Definition	measure of the granularity of the data (in metres)
Purpose and meaning	The purpose of this element is to provide an indication of how detailed the spatial data is. It is equivalent to the ground sample distance. It should not be confused with the scale of a map which is purely a display attribute (the spatial resolution should be defined in the specification of the data resource).
Obligation	conditional – for datasets and dataset series where a resolution distance can be specified, or for services where there is a restriction on the spatial resolution.
Occurrence	multiple
Data type	real
Domain	value > 0
Rules for how to fill in the entry	1. For data capture in the field, it is the precision at which the data is captured. This may be the accuracy for topographic surveys, or the granularity of sampling in an environmental survey. 2. For data taken from maps, it is the positional accuracy of the map (defined in the specification of the map series). 3. For image data, it is the resolution of the image.
Examples	10.0 0.001
Other comments	This should not be confused with precision which refers to the resolution of the measurements themselves. Thus for a buildings dataset, a building seed could be recorded to a precision of 0.1 metres, but since the requirement is for the seed only to be within the building footprint for the purpose of discriminating between buildings, the spatial resolution of the buildings dataset would be the typical size of the building, i.e. about 10 metres.

A.14 Resource locator

Metadata element name	Resource locator
Definition	location (address) for on-line access using a Uniform Resource Locator (URL) address or similar addressing scheme
Purpose and meaning	The purpose of this element is to point to where the dataset may be downloaded. This may be different from where it may be ordered online, which should be included in the web address of the distributor.
Obligation	conditional – when on-line access is available
Occurrence	multiple
Data type	character string
Domain	valid URL
Rules for how to fill in the entry	1. Identify whether the resource may be downloaded (if it cannot be downloaded, do not use this element). 2. Determine the location of the resource (may be a URL).
Examples	
Other comments	-

A.15 Data format

Metadata element name	Data format
Definition	format in which the digital data can be provided
Purpose and meaning	The purpose of this element is to identify the various options for data formats that may be provided.
Obligation	optional
Occurrence	multiple
Data type	MD_Format from ISO 19115
Domain	The following properties are expected: • Name of format • Version of the format (date, number etc)
Rules for how to fill in the entry	1. Entries should be recognised formats for data transfer, either standard or proprietary. 2. It is recommended to select a value from a controlled vocabulary, for example PRONOM[8]. 3. If the data is not transferable (e.g. is view only), then do not use this element.
Examples	GML, 3.2.1 DTF, 6.3
Other comments	-

[8] See http://www.nationalarchives.gov.uk/pronom

A.16 Responsible organisation

Metadata element name	Responsible organisation
Definition	details of the organisation(s) responsible for the establishment, maintenance and distribution of the resource
Purpose and meaning	This informs the user about who is responsible for the data resource
Obligation	mandatory
Occurrence	multiple
Data type	class
Domain	This class comprises seven elements relating to the responsible organisation: 1. contact position 2. organisation name 3. full postal address 4. telephone number 5. facsimile number 6. email address 7. web address 8. responsible party role
Rules for how to fill in the entry	1. Identify responsible parties and their particular role. For datasets and dataset series, at least a Distributor should be given. 2. See separate entries for each element. Organisation name, email address and responsible party role are mandatory. Other entries should only be given that are relevant and known. 3. Where there are several distributors, then a separate entry should be given for each.
Examples	See individual elements below.
Other comments	-

Details of the elements in the class are given in the following tables.

Metadata element name	contact position
Definition	role or position of the responsible person
Purpose and meaning	This is the person to contact in the organisation
Obligation	optional
Occurrence	single
Data type	character string
Domain	free text
Rules for how to fill in the entry	1. A general job title should be identified for someone in a position of responsibility for the data resource. 2. Do not identify an individual by name, as this is subject to change without warning and the information is impossible to keep up-to-date. 3. Where no single individual is responsible, a generic role may be given.
Examples	The mapping product manager
Other comments	-

Metadata element name	organisation name
Definition	name of organisation
Purpose and meaning	This is the name of the organisation
Obligation	mandatory
Occurrence	single
Data type	character string
Domain	free text
Rules for how to fill in the entry	The name of the organisation should be given in full, without abbreviations
Examples	The Ordnance Survey of Great Britain
Other comments	-

Metadata element name	postal address
Definition	postal address of the organisation
Purpose and meaning	This enables the user to contact the organisation by post
Obligation	optional
Occurrence	single
Data type	character string
Domain	free text
Rules for how to fill in the entry	The full formal postal address (as defined for example by Royal Mail) should be given, including the postcode.
Examples	Adanac Drive, Southampton, United Kingdom, SO16 0AS
Other comments	-

Metadata element name	telephone number
Definition	telephone number by which individuals can talk to the organisation or individual
Purpose and meaning	This enables the user to contact the organisation by telephone
Obligation	optional
Occurrence	single
Data type	character string
Domain	free text
Rules for how to fill in the entry	The full telephone number should be given.
Examples	+44 8456 050505
Other comments	-

Metadata element name	facsimile number
Definition	telephone number by which individuals can communicate with the organisation or individual by facsimile
Purpose and meaning	This enables the user to contact the organisation by fax
Obligation	optional
Occurrence	single
Data type	character string
Domain	free text
Rules for how to fill in the entry	The full telephone number should be given.
Examples	+44 238079 2615
Other comments	-

Metadata element name	email address
Definition	internet email address which individuals can use to contact the organisation or individual
Purpose and meaning	This enables the user to contact the responsible organisation by email
Obligation	mandatory
Occurrence	single
Data type	character string
Domain	free text
Rules for how to fill in the entry	A valid email address should be given.
Examples	customerservices@ordnancesurvey.co.uk
Other comments	-

Metadata element name	web address
Definition	World Wide Web address of organisation
Purpose and meaning	This enables the user to locate further information about the distributor
Obligation	optional
Occurrence	single
Data type	character string
Domain	free text
Rules for how to fill in the entry	A valid World Wide Web address should be given.
Examples	www.ordnancesurvey.co.uk
Other comments	-

Metadata element name	responsible party role
Definition	role of the responsible organisation
Purpose and meaning	This enables the responsible party to have roles other than distributor.
Obligation	mandatory
Occurrence	multiple
Data type	code list
Domain	Responsible party role (see below)
Rules for how to fill in the entry	The role of the responsible party should be identified. At least a distributor should be given.
Examples	distributor
Other comments	-

Responsible party role

Code	Name	Definition
1	resource provider	party that supplies the resource
2	custodian	party that accepts accountability and responsibility for the data and ensures appropriate care and maintenance of the resource
3	owner	party that owns the resource
4	user	party who uses the resource
5	distributor	party who distributes the resource
6	originator	party who created the resource
7	point of contact	party who can be contacted for acquiring knowledge about or acquisition of the resource
8	principal investigator	key party responsible for gathering information about or acquisition of the resource
9	processor	party who has processed the data in a manner such that the resource has been modified
10	publisher	party who published the resource
11	author	party who authored the resource

A.17 Frequency of update

<table>
<tr><td>Metadata element name</td><td>Frequency of update</td></tr>
<tr><td>Definition</td><td>frequency with which modifications and deletions are made to the data after it is first produced</td></tr>
<tr><td>Purpose and meaning</td><td>This identifies how often the updated data resource is made available to the user (for instance a data resource may be updated continuously, but released to the user only monthly).</td></tr>
<tr><td>Obligation</td><td>optional</td></tr>
<tr><td>Occurrence</td><td>single</td></tr>
<tr><td>Data type</td><td>code list</td></tr>
<tr><td>Domain</td><td>
<table>
<tr><th>Name</th><th>Domain code</th></tr>
<tr><td>continual</td><td>001</td></tr>
<tr><td>daily</td><td>002</td></tr>
<tr><td>weekly</td><td>003</td></tr>
<tr><td>fortnightly</td><td>004</td></tr>
<tr><td>monthly</td><td>005</td></tr>
<tr><td>quarterly</td><td>006</td></tr>
<tr><td>biannually</td><td>007</td></tr>
<tr><td>annually</td><td>008</td></tr>
<tr><td>as needed</td><td>009</td></tr>
<tr><td>irregular</td><td>010</td></tr>
<tr><td>not planned</td><td>011</td></tr>
<tr><td>unknown</td><td>012</td></tr>
</table>
</td></tr>
<tr><td>Rules for how to fill in the entry</td><td>1. Pick a value from the table that most closely corresponds to the update frequency for the data resource.
2. Where no value corresponds exactly to reality, the nearest should be chosen.
3. If there are two values that apply equally, then select the one indicating less frequency.
4. Where the data resource is not updated, use 011 (not Planned)</td></tr>
<tr><td>Examples</td><td>continual</td></tr>
<tr><td>Other comments</td><td>The domain codes are taken from ISO 19115 (MD_MaintenanceFrequencyCode)</td></tr>
</table>

A.18 Limitations on public access

Metadata element name	Limitations on public access
Definition	restrictions imposed upon the resource for security and other reasons
Purpose and meaning	The purpose of this element is to identify any external restrictions on access to the data such as licence arrangements.
Obligation	mandatory
Occurrence	multiple
Data type	character string
Domain	free text
Rules for how to fill in the entry	1. The most common access restriction should be identified. 2. Where there are no limitations on public access, this should be stated. 3. More than one value may be included.
Examples	No restriction on public access.
Other comments	Limitations on public access are different from Use constraints which are warnings about its suitability for particular types of usage.

A.19 Use constraints

Metadata element name	Use constraint
Definition	restrictions and legal restraints on using the data resource
Purpose and meaning	The purpose of this element is to describe any restrictions on usage of the data (as opposed to access)
Obligation	mandatory
Occurrence	multiple
Data type	character string
Domain	free text
Rules for how to fill in the entry	Any known constraints should be identified. If no conditions apply, then ‘No conditions apply’ should be recorded.
Examples	Should not be used for navigation purposes.
Other comments	Use constraints are different from Restrictions on public access which describe limitations on access to the data. A data resource can have open access (e.g. to look at it), but restricted use.

A.20 Additional information source

Metadata element name	Additional information source
Definition	source of other descriptive information about the data resource
Purpose and meaning	The purpose of this element is to record references to relevant information held externally, for example a reference (e.g. a URL) to background information.
Obligation	optional
Occurrence	single
Data type	character string
Domain	free text
Rules for how to fill in the entry	Any references (e.g. a URL) to external information that are considered useful may be recorded.
Examples	"For full details about this dataset, see http:// www.ordnancesurvey.co.uk/business-and-government/products/address-layer-2"
Other comments	-

A.21 Metadata date

Metadata element name	Metadata date
Definition	date on which the metadata was last updated, or was confirmed as being up-to-date, or if not updated, then the date it was created
Purpose and meaning	This is the date at which the metadata can be considered current (rather than the dataset itself). It may be the date at which the metadata was reviewed and confirmed as being 'current'.
Obligation	mandatory
Occurrence	single
Data type	date
Domain	Single date as specified by ISO 8601 in the extended date format (YYYY-MM-DD), where YYYY is the year, MM is the month and DD is the day. Time (HH:MM:SS, where HH is the hour, MM the minutes and SS the seconds) may be added if required, separated from the day by 'T'.
Rules for how to fill in the entry	1. This should be updated whenever the metadata is updated due to a change in the dataset, or when it is reviewed and confirmed as wholly correct. 2. The date should be at an appropriate level of resolution (e.g. the day, or the day and month). 3. The date should not be in the future.
Examples	2001-09-02
Other comments	-

A.22 Metadata language

Metadata element name	Metadata language
Definition	language used for documenting the metadata
Purpose and meaning	The purpose of this is to identify the language used in a multi-lingual metadata service, for example in the INSPIRE geo-portal.
Obligation	conditional – required if claiming conformance to INSPIRE
Occurrence	single
Data type	character string
Domain	free text
Rules for how to fill in the entry	A value should be taken ISO 639-2 which uses three-letter primary tags with optional subtags. The values for the UK are: English eng Welsh cym Gaelic (Irish) gle Gaelic (Scottish) gla Cornish cor Ulster Scots sco In general, a default value of ‘eng’ can be applied.
Examples	eng
Other comments	Other European languages are listed under Dataset language.

A.23 Metadata point of contact

Metadata element name	Metadata point of contact
Definition	party responsible for the creation and maintenance of the metadata
Purpose and meaning	This is the organisation or role in an organisation responsible for this metadata.
Obligation	mandatory
Occurrence	multiple
Data type	character string
Domain	free text
Rules for how to fill in the entry	Include organisation name and contact email address, as described under Responsible party.
Examples	Large-scale Topographic Data Manger, Ordnance Survey.
Other comments	-

A.24 Unique resource identifier

Metadata element name	Unique resource identifier
Definition	value uniquely identifying the data resource
Purpose and meaning	The purpose of this is to uniquely identify the data resource.
Obligation	mandatory for datasets and dataset series
Occurrence	multiple
Data type	class
Domain	The class comprises the following elements: • Code - Identifier code or name, often from a controlled list or pattern defined by a code space. • codespace (optional) - Identifier of a code space within which one or more codes are defined.
Rules for how to fill in the entry	The resource is identified by a unique identifier code, generally assigned by the data owner. A character string namespace uniquely identifying the context of the identifier code may be added for uniqueness. This is usually allocated by an appropriate authority such as the manager of the spatial data infrastructure.
Examples	gigateway/17
Other comments	-

A.25 Spatial data service type

Metadata element name	Spatial data service type
Definition	generic name of the service type
Purpose and meaning	This identifies the type of service
Obligation	conditional – required if the resource is a service
Occurrence	single
Data type	generic name
Domain	Possible values are as follows (in brackets are the language neutral names to be used): Discovery Service (discovery) View Service (view) Download Service (download) Transformation Service (transformation) Invoke Spatial Data Service (invoke) Other Service (other)
Rules for how to fill in the entry	Select generic type from list. These service types are explained in the INSPIRE Metadata Guidelines.[9]
Examples	View service
Other comments	-

[9] see Guidelines based on EN ISO 19115 and EN ISO 19119 for Commission Regulation (EC) No 1205/2008 of 3 December 2008 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards metadata

A.26 Coupled resource

Metadata element name	Coupled resource
Definition	identifier of datasets that the service operates on
Purpose and meaning	This identifies the dataset(s) associated with the service
Obligation	conditional – required where relevant if the resource is a service Not applicable to datasets or dataset series
Occurrence	multiple
Data type	character string
Domain	unique resource identifier (URI) or locator of the data resource(s)
Rules for how to fill in the entry	identify the data resources on which the service operates
Examples	http://image2000.jrc.ec.europa.eu/#image2000_1_n12_multi
Other comments	-

A.27 Resource type

Metadata element name	Resource type
Definition	scope to which metadata applies
Purpose and meaning	This identifies whether the data resource is a dataset, dataset series or data service.
Obligation	mandatory
Occurrence	single
Data type	code list
Domain	MD_ScopeCode from ISO 19115. Codes to be used for INSPIRE are: dataset series service
Rules for how to fill in the entry	Identify whether resource is a dataset, a series (collection of datasets with a common specification) or a service.
Examples	dataset
Other comments	-

A.28 Conformity

Metadata element name	Conformity
Definition	degree of conformity with the product specification or user requirement against which the data is being evaluated
Purpose and meaning	The purpose of this is to record the conformity to the INSPIRE or other data specification
Obligation	conditional – required if claiming conformance to INSPIRE
Occurrence	multiple
Data type	class
Domain	This class comprises the following elements: 1. Specification 2. Degree 3. Explanation For details see below.
Rules for how to fill in the entry	Assess the conformity of the data resource against its product specification or the INSPIRE thematic data specification. If these have not been finalised, then the data resource's own specification should be used.
Examples	-
Other comments	1. The specification is identified in the element Specification. 2. The conformance of a data resource may be considered with respect to more than one specification.

The elements in the class are described in the following tables.

Metadata element name	Specification
Definition	citation of the product specification or user requirements against which the data resource is evaluated
Purpose and meaning	The purpose of this element is to identify the specification against which conformity is evaluated
Obligation	mandatory
Occurrence	single
Data type	CI_Citation (from ISO 19115)
Domain	The following properties are expected: • title of type character string (free text) • reference date defined as o a date type (creation, revision or publication) o an effective date
Rules for how to fill in the entry	Cite the specification to which the data resource should conform
Examples	D2.8.I.5 INSPIRE Data Specification on *Addresses* – Guidelines, publication, 2010-04-26
Other comments	-

Metadata element name	degree
Definition	degree of conformity with the specification
Purpose and meaning	The purpose of this element is to identify the conformity of the data resource to the cited specification
Obligation	mandatory
Occurrence	single
Data type	Boolean
Domain	• **true** if conformant • **false** if not conformant
Rules for how to fill in the entry	The data resource should be evaluated against the specification and the result recorded.
Examples	true
Other comments	-

Metadata element name	explanation
Definition	meaning of conformance for this result
Purpose and meaning	The purpose of this element is to explain the meaning of conformity in this context.
Obligation	mandatory
Occurrence	single
Data type	character string
Domain	free text
Rules for how to fill in the entry	Include a statement about which aspects of the specification the data resource conforms and any exceptions.
Examples	Only mandatory items included Not tested
Other comments	-

A.29 Equivalent scale

Metadata element name	equivalent scale
Definition	level of detail expressed as the scale denominator of a comparable hardcopy map or chart
Purpose and meaning	this is purely to conform to INSPIRE, and has little meaning for most digital data
Obligation	optional
Occurrence	multiple
Data type	integer
Domain	positive integer
Rules for how to fill in the entry	Where the data is captured from a map, the scale of that map should be recorded.
Examples	5,000
Other comments	Expression of spatial resolution by distance is preferred. Spatial resolution should only be expressed by equivalent scale where a distance cannot be determined.

A.30 Bounding box

Metadata element name	bounding box
Definition	rectangle enclosing the extent of the data resource described in latitude and longitude
Purpose and meaning	this is to enable the resource to be located geographically
Obligation	mandatory for datasets and dataset series, conditional for services on there being a defined extent for the service
Occurrence	multiple
Data type	class
Domain	This has the elements, expressed in latitude and longitude in decimal degrees (positive north or east): • West bounding longitude, in the range {-180.00, 180.00} • East bounding longitude, in the range {-180.00, 180.00} • South bounding latitude, in the range {-90.00, North bounding latitude} • North bounding latitude, in the range {South bounding latitude, 90.00}
Rules for how to fill in the entry	Identify a bounding box slightly larger than the extent of the data resource, and determine the coordinates of the boundaries. It may be necessary to convert from another coordinate system (e.g. National Grid) into lat/long.
Examples	-9.23, 2.69, 49.84, 60.85
Other comments	Only approximate values are required, sufficient to identify the extent on a global basis.