DGIWG 260
International Program for Human Geography (IPHG)
Data Product Specification (DPS)

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Abstract:	This is a data product specification describing the standardised concepts encoding and data exchange requirements for Cultural Context and Statistical Extent Location vector data as defined by the International Program of Human Geography (IPHG) in the form of Geography Mark-up Language (GML) application schema and Feature Catalogue derived from Defence Geospatial Information Framework (DGIF).
Copyright:	

i. Contributing participants

Nation	Parent Organisation
United Kingdom (Lead Nation)	Ministry of Defence Strategic Command Joint User; Defence Geographic Centre
Denmark	Styrelsen for Dataforsyning og Effektivisering (Agency for Data Supply and Efficiency)

ii. Document points of contact

All questions regarding this document shall be directed to the secretariat@dgiwg.org.

NOTE: All personal information will be removed when an internal document is made public. This includes names and personal e-mail accounts.

iii. Revision history

Version	Date	Comments
0.0	02/03/2021	Template (based on DTOX DPS) and First Draft
0.1	17/05/2021	Technical Review and amendments
0.2	25/05/2021	Formatting and editorial Review and Amendments including IPHG consultation
0.3	06/06/2021	Additional Technical and Editorial review and amendments
0.4	15/06/2021	VMST Editorial Review
0.5	03/09/2021	Resolution of comments from P0, Additional formatting and editorial changes

iv. Future work

This DPS is conformant to, and references, DGIF Baseline 2020-2. Future changes to DGIF and DMF do not automatically necessitate a review and uplift and the DPS remains valid (maintaining backwards compatibility is a guiding principle in DGIF Change Proposals). Future DGIF change proposals or change requirements that may impact content in this DPS (whether initiated by IPHG or another party) will be communicated with IPHG. Review, update and/or supersession of this DPS and/or its content will only be carried out in agreement, and between, IPHG and DGIWG.

Table of Contents

Introduction

This Data Product Specification (DPS) describes the requirements for defining and exchanging standardised geospatial vector data covering the Cultural Context and Statistical Extent Locations as set out by the International Program for Human Geography (IPHG).

IPHG was established to enable collaborative development of human geography methodologies and the production and sharing of Standard Human Geography Data (SHGD) across the international community. This data can be included alongside, or integrated with, foundation geospatial data such as boundaries, geographic names and features to provide the human geography context within geospatial datasets and products in accordance with defence user requirements.

IPHG has an objective, in collaboration with relevant parties, to establish common data content, standards and exchange formats to inform the creation of relevant IPHG resources and data products within their programme. To ensure the compatibility, consistency and deconfliction of SHGD with other geospatial data, it was essential that relevant HG Concepts were formalised and integrated into the Defence Geospatial Information Framework (DGIF).

Conformance/compatibility with DGIF is achieved by using DGIF-derived DPSs. The DGIF is a suite of DGIWG managed international standards and specifications encompassing integrated and harmonized geospatial information concepts covering land, aeronautical, maritime, meteorological, oceanographic and, increasingly, Human Geography domains. DGIF provides a common model solution allowing for the generation of standardised exchange and output product specifications which provide interoperability bridges between national and other community models and schemas. The DGIWG both maintains and evolves the content of the core artefacts and, additionally, develops the required specifications for end user implementations.

This DPS is the culmination of a collaboration between DGIWG and IPHG to integrate and standardise relevant HG concepts in DGIF and deliver an IPHG specific, DGIF compliant specification. It primarily informs the creation of internal IPHG programme schemas and associated documents that support IPHG SHGD Data Collection.

Independently, it provides an open standard specification that can be utilised by clients/organisations to specify applications or exchange datasets compatible with the IPHG Programme.

The format of this document is based on the “DGIWG – 16-002 DGIWG profile of ISO 19131 Geographic information – Data product specification”. This DGIWG profile extends the ISO standard to provide a definition of the format, content and structure of a specification for geospatial data products meeting military requirements.

Comments, questions, or suggestions to improve this document should be addressed to the DGIWG secretariat@dgiwg.org.

1 Scope

This DPS describes the requirements for defining SHGD within resources, applications and data exchange products produced by, or in relation to, the International Program for Human Geography (IPHG). The conceptual space covered by the SHGD is specific to use-case content required by IPHG. This IPHG conceptual requirement is referred to as the IPHG Universe of Discourse in this DPS.

There are two main purposes covered by this DPS. Primarily, it informs IPHG of the creation of DGIWG conformant implementations and supporting documentation to support the creation and exchange of SHGD within their programme. The provisions defining this DPS apply across the IPHG production environments. Secondarily, it provides an open format specification for defining IPHG interoperable applications and datasets.

To cover the IPHG Universe of Discourse, this DPS defines a SHGD content in two vector dataset product outputs for:

1) Cultural Context Locations (CCL, i.e. information regarding ethnic groups associated to an area and their characteristics, e.g. religion and language).

2) Statistical Extent Locations (SEL, i.e. the areas where statistical measures apply).

To achieve this, the DPS and its four Supporting Documentation (SD) materials, specify DGIF compliant encodings for the relevant SHGD feature and attribute concepts, as well as providing an open standard application schema and dataset metadata (see Figure 1).

GML Application Schemas
Two separate flattened GML Schemas are specified in the SDs integral to this DPS. One for each dataset, including:

- **DGIWG-260 SD 1: IPHG Cultural Context Location Data (IPHG-CCL) GML-Application Schema (.xsd).**
- **DGIWG-260 SD 2: IPHG Statistical Extent Location Data (IPHG-SEL) GML-Application Schema (.xsd).**

IPHG Feature Catalogue
To ensure an understanding of the content of the GML application schemas, a combined flattened feature catalogue in HTML format is provided as part of the DPS (DGIWG-260 SD 4). This encompasses all the feature, attribute, code list and datatype content of all IPHG Schemas covered by this DPS utilising relevant concepts from the Defence Geospatial Feature Concept Dictionary (DGFCD).

- **DGIWG-260 SD 4: IPHG Data Feature Catalogue (.html)**

IPHG Metadata Schema
When delivering these as vector datasets, metadata is required to describe the delivery. The metadata requirement is defined in the DPS with reference to DGIWG-114 v2.0.0 (DGIWG

Metadata Foundation (DMF) version 2.0). A metadata schema is included as part of this DPS. (DGIWG-260 SD-3).

- **DGIWG-260 SD 3: IPHG Data Metadata Schema (.xsd)**

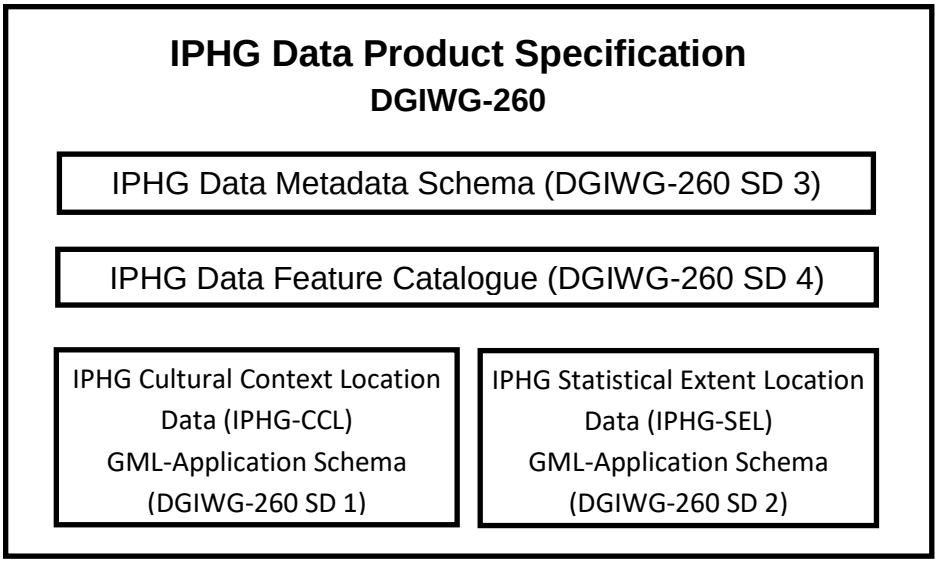

Figure 1: IPHG Data Product Specification and Supporting Documentation

2 Conformance

Conformance to the provisions of this DPS are defined in Subclause 10.2.

3 Reference Documents

The content referenced in this DPS and detailed in the artifacts included in its SDs, are based on an IPHG profile of the Defence Geospatial Information Model (DGIM) which is the core artifact of the DGIF, covering the objects, concepts, attributes and relations necessary to meet the specified IPHG SHGD requirement. The DGIM baseline for this profile is 2020-2 which standardises and integrates the human geography concepts into the information model.

(1) DGIWG-200 Defence Geospatial Information Framework (DGIF) - Overview 2.0.0 (2017) https://www.dgiwg.org/dgiwg-standards/200

(2) DGIWG-205 Defence Geospatial Information Model (DGIM) 2.0.0 (2017) https://www.dgiwg.org/dgiwg-standards/205

-- DGIWG-205 SD1 Defence Geospatial Information Model (DGIM) - Normative content - SD1: Offline model (.eap) (2020-2 Baseline)

-- DGIWG-205 SD2 Defence Geospatial Information Model (DGIM) - Normative content - SD2: Content Workbook View (2020-2 Baseline)

(3) DGIWG-206 Defence Geospatial Feature Concept Dictionary (DGFCD) Description and Content 2.0.0 (2017) https://www.dgiwg.org/dgiwg-standards/206

(4) DGIWG-207 Defence Geospatial Real-World Object Index (DGRWI) 2.0.0 (2017) https://www.dgiwg.org/dgiwg-standards/207

DGIF Specifies a GML encoding for application schemas. This is detailed in the following standard:

(5) DGIWG-208 Defence Geospatial Information Framework Encoding Specification - Part 1: GML 2.0.0 (2017) https://www.dgiwg.org/dgiwg-standards/208

4 Terminology

4.1 Terms and definitions

Data Product

Dataset or dataset series that conform to this data product specification.

Data Product Specification

Detailed description of a dataset or dataset series together with additional information that will enable it to be created, supplied to and used by another party.

[ISO 19131:2007]

NOTE: A data product specification provides a description of the universe of discourse and a specification for mapping the universe of discourse to a dataset. It may be used for production, sales, end-use or other purpose.

Dataset

Identifiable collection of data

[ISO 19115-1:2014]

NOTE: A dataset may be a smaller grouping of data which, though limited by some constraint such as spatial extent or feature type, is located physically within a larger dataset. Theoretically, a dataset may be as small as a single feature or feature attribute contained within a larger dataset. A hardcopy map or chart may be considered a dataset. In this DPS, a dataset refers to a combined set of geographical vector features and related attributes that follow this specification.

Dataset Series

Collection of datasets sharing the same product specification.

[ISO 19115-1:2014]

Profile

Set of one or more base standards or subsets of base standards, and where applicable, the identification of chosen clauses, classes, options, and parameters of those base standards, that are necessary for accomplishing a particular function.

[adopted from ISO 19106:2004]

NOTE A profile is derived from base standards so, by definition, conformance to a profile is conformance to the base standards from which it is derived.

Universe of Discourse

View of the real or hypothetical world that includes everything of interest.

[SOURCE: ISO 19101]

The entire system of concepts forming a frame of reference within a particular domain or discourse.

[SOURCE: Oxford Reference]

The complete range of objects, events, attributes, relations, ideas, etc, that are expressed, assumed, or implied in a discussion.

[SOURCE: Collins]

NOTE: The Universe of Discourse for this specification is that of Cultural Context and Statistical Extent Location information identified and captured by the IPHG at the time of publishing and specific to their programme. This universe of discourse does not bound a broader potential scope or limit for Human Geography information in general or for Cultural Context and Statistical Extent Location specifically, either within IPHG or other communities.

4.2 Abbreviated Terms

CCL	Cultural Context Location
DGIF	Defence Geospatial Information Framework
DGIM	Defence Geospatial Information Model
DGFCD	Defence Geospatial Feature Concept Dictionary
DMF	DGIWG Metadata Foundation
DPS	Data Product Specification
HG	Human Geography
EGM	Earth Gravity Model
EPSG	European Petroleum Survey Group

FFLA	Full Flat
GML	Geographic Markup Language
IPHG	International Program for Human Geography
MDS	Metadata Schema
SEL	Statistical Extent Location
SHGD	Standardised Human Geography Data
UTF-8	Unicode Transformation Format 8-bit
WGS84	World Geodetic System 1984
XML	eXtended Markup Language

5 Structure and Content of Specification

This DPS is structured in accordance with [DGIWG 101 Profile of ISO 19131 Geographic information – Data product specification].

Table 1 outlines the sections required to be defined within the DPS and for which information is provided.

Table 1: DPS Sections

Section	Section Name	Description	Requirement
6	Overview	General introductory information on the data product along with product specification metadata.	Mandatory (1,1)
7	Specification Scopes	A description of the scope of the data product.	Mandatory (1,*)
8	Data product Identification	Information by which the data product can be identified.	Mandatory (1,1)
9	Data Content and Structure	The content information of a data product is described in terms of an application schema and a feature catalogue, references to these and a narrative description.	Mandatory (1,*)
10	Reference Systems	Information that defines the reference systems used in the data product.	Mandatory (1,*)
11	Data Quality	Data quality requirements for the data product in accordance with [ISO 19157].	Mandatory (1,*)
12	Data Production	Descriptive guidance and rules in order to produce a data product conforming to this specification.	Mandatory (1, *)
13	Data Maintenance	Information on how the data product is maintained.	Optional (0,*)
14	Portrayal	Information on how the data is to be presented as graphic output, as a plot, or as an image.	Optional (0,*)
15	Delivery Information	Requirements for the data product delivery.	Mandatory (1,*)
16	Additional information	Any other aspects of the data product not provided elsewhere in this specification.	Optional (0,*)
17	Metadata	The metadata elements to describe the content, reference system, quality, and other characteristics of the data product.	Mandatory (1,1)

6 IPHG Data Product Specification Overview

This section provides an overview, details of the DPS metadata and an informal description of the data product produced from the DPS.

Table 2 describes the DPS overview information required and described by this DPS.

Table 2: Data product specification overview items

Item name	Description
overview	General information about the product specification.

Table 3 describes the applicable DPS Metadata required for and defined in this DPS.

Table 3: Data product specification metadata

Item name	Description
title	Title of the data product specification.
version	Version of the data product specification.
date	Date the product specification was created / published.
language	Language(s) of the data product specification, e.g. translations.
classification	Classification code of the handling restriction on the data product specification.
contact	Party responsible for the data product specification.
url	Online-address where the resource is downloadable.
identifier	Persistent unique identifier for a published version of the product specification.
maintenance	Description of the maintenance regime for the product specification.
keyword	Commonly used word(s) or formalised word(s) or phrase(s) used to describe the subject.
topicCategory	The main theme(s) of the data product.
distributionFormat	The format in which the product specification is provided.
useLimitation	General use limitations (limitations not implied by security or legal constraints) of the data product specification.

Table 4 describes the items required by and defined in this DPS to provide an informal description of the product produced by this specification.

Table 4: Data product specification metadata

Item name	Description
title	Official designation of the data product
abstract	Informal description of the data product
acronym	Any acronyms for the title of the data product
content	Textual description of the content of any dataset compliant with this specification
spatialExtent	Description of the spatial extent covered by the data product
temporalExtent	Description of the temporal extent covered by the data product
specificPurpose	Specific purpose for which the data has been collected or can be used

The applicable information for these items is outlined in the sub-sections below.

6.1 DPS Overview

- **Overview** This Data Product Specification (DPS) describes the requirements for defining Standard Human Geography Data (SHGD) within resources, applications and data exchange products produced by, or in relation to, the International Program for Human Geography (IPHG).

  There are two main purposes of this DPS. Primarily, it informs IPHG in the creation of DGIWG conformant implementations and supporting documentation to support their programme. The provisions defining this DPS apply across the IPHG production environments. Secondarily, it provides an open format specification for defining IPHG interoperable applications and datasets. This DPS is an IPHG universe of discourse for SHGD which will define two vector dataset product outputs, including:

  1) Cultural Context Locations (CCL, i.e. information regarding ethnic groups associated to an area and their characteristics, e.g. religion and language).

  2) Statistical Extent Locations (SEL, i.e. the areas where statistical measures apply).

  This DPS contains Feature/Attribute application schemas (encoded in GML), dataset level metadata schemas (encoded in XML) and an accompanying feature catalogue that enables the encoding IPHG Standardised Human Geography Data (SHGD) covering their Cultural Context Location (CCL) and Statistical Extent Location (SEL) universe of discourse. This enables IPHG (and their clients/participants) to implement DGIF compliant solutions in support of the programme and exchange IPHG datasets conformant to DGIF.

6.2 DPS Metadata

- **Title** DGIWG 260:
  International Program for Human Geography (IPHG) Data Product Specification (DPS)

- **Version** Version 1.0

- **Date** 10 October 2021

- **Language** English

  NOTE: The English is used according to Shorter Oxford English Dictionary (5th edition).

- **Classification** UNCLASSIFIED

- **Contact** secretariat@dgiwg.org

  NOTE: Comments, questions, or suggestions to improve this document should be addressed to the Defence Geospatial Information Working Group at “secretariat@dgiwg.org”.

- **URL** https://www.dgiwg.org/dgiwg-standards/260

- **Identifier** DGIWG-260_IPHG_DPS_1.0

- **Maintenance** Subject to IPHG/DGIWG requirements and agreement.

  This DPS is conformant to, and references, DGIF Baseline 2020-2. Future changes to DGIF and DMF does not automatically necessitate a review and uplift and the DPS remains valid (maintaining backwards compatibility is a guiding principle in DGIF Change Proposals). Future DGIF change proposals or change requirements that may impact content in this DPS (whether initiated by IPHG or another party) will be communicated with IPHG. Review, update and/or supersession of the DPS and/or its content will only be carried out in agreement and between IPHG and DGIWG.

  The Maintenance interval of this DPS will be subject to IPHG/DGIWG requirements and agreement.

- **Keywords** GML, DPS, Profile, Human Geography, International Program of Human Geography, IPHG, Data Exchange Schema, Vector data, Cultural Context, Statistics.

- **Topic Categories** 003: Boundaries**,** 016: Society

  NOTE: Topic categories selected from Topic Category Enumeration from ISO 19115-1.

- **Distribution Format** Portable Document Format (PDF).

- **Use Limitation** This DPS should be used for defining Standard Human Geography Data (SHGD) within resources, applications and data exchange products produced by, or in relation to, the International Program for Human Geography (IPHG) in a fully flattened schema form.

  This DPS informs the creation of IPHG programme schemas and documents to support the standardized collection and exchange of IPHG Cultural Context Location (CCL) and Statistical Extent Location (SEL) datasets. It can also be used externally to IPHG to specify applications or datasets compatible with the IPHG Programme and are DGIF Compliant. However, DGIWG and IPHG consultation is advised if used independently.

6.3 Informal Description of the Data Product

NOTE: The Product Identification information in this section only applies to open standard Datasets produced conformant to this specification.

- **Title** IPHG Cultural Context Location (IPHG-CCL), or

  IPHG Statistical Extent Location (IPHG-SEL)

- **Abstract** The exchange SHGD for CCL or SEL.

  The purpose of this product is to exchange SHGD for Cultural Context and/or Statistical Extent Location as a GML file in accordance with the DGIM and an XML file with the corresponding dataset metadata.

- **Acronym** IPHG-CCL, or IPHG-SEL

- **Content** SHGD for CCL or SEL

  The data product contains IPHG data directions for Cultural Context Locations (CCL) which provide locations of, and information about, ethnic groups and their characteristics, e.g. religion and language, or….

The data product contains IPHG data directions for Statistical Extent Locations (SEL) which provides locations for which a statistical measure or information apply.

- **Spatial Extent** Content specific

  A spatial extent is in accordance with the geographic extent of the SHGD included in the dataset intended to be exchanged.

- **Temporal Extent** Source specific

  A temporal extent is, in accordance with the source dates of the SHGD, included in the dataset intended to be exchanged.

- **Specific Purpose** To encode SHGD for CCL or SEL

  To encode and provide data that describes the Cultural Context information over a given location (ethnicity, languages, belief systems), or….

  To encode and provide data that describes human geography statistical sets (e.g. demographic, human activity and measures) over a given location.

7 Specification Scopes

This section provides a description of the scope of the data products produced from this DPS.

Table 5 describes the items required by this DPS to provide the description of the scope.

Table 5: Scope Information

Item name	Description
scopeIdentification	identification of the scope for the purpose of a particular data specification.
level	hierarchical level of the data specified by the scope.
levelName	name of the hierarchy level of the data specified by the scope.

A Data Product produced from this DPS shall conform to the values below:

- **Scope Identification** Root scope

  NOTE: If the product is homogenous a single ‘root scope’ may be defined.

- **Level** Dataset

- **Level Name** IPHG-CCL or IPHG-SEL

8 Data Product Identification

This section provides details of the Data Product identification for a product created using this DPS. This information supports the discovery and identification of suitable data products by users.

NOTE: The Product Identification information in this section only applies to open standard datasets produced conformant to this DPS.

Table 6 describes the items required by this DPS to provide an informal description of the product produced by this specification.

Table 6: Data product identification metadata

Item name	Description
title	title of data product.
abstract	brief narrative summary of the content of the data product.
keyword	commonly used word(s) or formalised word(s) or phrase(s) used to describe the subject.
topicCategory	main theme(s) of the dataset.
geographicExtent	description of the geographic area within which data is available.
language	language(s) of the dataset.
classifierClassificationSystem	This is the classification system related to the classification level. The classification system is expressed as a code of the corresponding country or NATO Body.
classification	classification code of the handling restriction on the data product.
handlingDescription	additional information about the restrictions on handling the resource.
pointOfContact	identification of, and means of communication with, person(s) and organization(s) associated with the data.
useLimitation	this element provides a means to express general use limitations (limitations not implied by security or legal constraints) of the resource.
identificationScope	reference to the applicable scope.

A Data Product produced from this DPS shall conform to the values below.

- **Title** In accordance to the format below.

  The structure for naming files according to the IPHG-CCL or IPHG-SEL DPS is defined below:

  1. Producer identifier (i.e. ISO 3166 code)
  2. Data Product acronym (i.e. IPHG-CCL or IPHG-SEL)
  3. DPS version (i.e. 1.0)
  4. Producer allocated numeric/alphanumeric identifier (IPHG naming convention or National identifier)
  5. File edition

Example:
GBR_IPHG_CCL_1_0_Syria_EthnicGroupsandReligions_1_2_06_2019_GBR_CAT1_4

(Where “Syria_Ethnic Groups and Religions_1_2_06_2019_GBR_CAT1” represents an IPHG product naming convention example).

- **Abstract** — A narrative description of the SHGD captured or exchanged as defined by the creator.

- **Keywords** — Relevant keywords based on content.

  e.g. Communications, Media, Demographic, Economic, Education, Ethnicity, Events, Groups, Organisations, Health, Medical, Land Use, Language, Politics, Religion, Transportation Use, Water Supply and Control.

  NOTE: This list is based of IPHG Human Geography themes.

- **Topic Category** — Society

  Definition: Characteristics of society and cultures (e.g. settlements, anthropology, archaeology, education, traditional beliefs, manners and customs, demographic data, recreational areas and activities, social impact assessments, crime and justice, census information).

  NOTE: The is the main topic covered by both IPHG-CCL and IPHG-SEL (as defined by DMF Topic Category). However, other topic categories may be applicable in relation to SHGD Statistics collection.

- **Geographic Extent** — Dataset specific

  A description of the geographic extent of the SHGD included in the specific dataset intended to be exchanged.

- **Language** — English.

- **Classifier Classification System** — Country of Body Specific

  The identification of the classification system used is expressed by reference to the appropriate and corresponding country or NATO Body using standard country codes (e.g. ISO 3166).

NOTE: Each IPHG dataset is provided with a security classification. The appropriate note or statement shall be determined in accordance with the provisions of the producing nation or organization. The classification system will be specific to a country or international body.

- **Classification** Country of Body Specific

  The security classification of the products generated by the use of this specification should be the lowest category practicable. This is normally UNCLASSIFIED with some form of restricted dissemination to be noted in the Handling Description.

  NOTE: The level of classification is determined in accordance with the provisions and regulations of the producing nation or organization. The appropriate classification shall be indicated in the security classification guidance for the project, operation or exercise.

  The Classification shall also contain instructions for potential downgrading/declassification from the original producing nation or organisation as well as a point of contact.

- **Handling Description** Country of Body Specific

  The appropriate note or statement relating to handling or release restrictions shall be determined in accordance with the provisions of the producing nation or organization. The specific note shall be indicated in pertinent security classification guidance for the project, operation, or exercise.

- **Point of Contact** Country of Body Specific

  The point of contact for the SHGD products is defined by each nation or organization and shall be contained in the product metadata file.

- **Identification Scope** Root Scope (Dataset)

9 Data Product Content and Structure

This section describes the content and structure required for a data product produced from this DPS. For a feature-based product, such as defined in this DPS, it is described in terms of an application schema and a feature catalogue.

The required content information of this data product is described within the two flattened application schemas and a single combined feature catalogue:

1. **260 SD 1: IPHG Cultural Context Location (IPHG-CCL) GML-Application Schema (.xsd)**
2. **260 SD 2: IPHG Statistical Extent Location Data (IPHG-SEL) GML-Application Schema (.xsd)**
3. **260 SD 4: IPHG Data Feature Catalogue (.html)**

These provide the appropriate feature types, attributes, values, their relationships, and encoding for SHGD describing locations of, and information about, ethnic groups and their characteristics. For example, religion and language (Cultural Context Location) and locations for which a statistical measure or information apply (Statistical Extent Locations).

The application schemas are defined in GML 3.2.1. in accordance with DGIWG-208 (Defence Geospatial Information Framework Encoding Specification - Part 1).

A human readable version of the Feature Catalogue is provided in html.

NOTE: In accordance with DGIF Principles, GML application schemas are created in order to facilitate open standard exchange of geospatial data which are derived from, and must be in accordance with, a profile from a specific baseline of the information model (DGIM).

To fully deliver/exchange data in accordance with the DGIM profile, a 1:1 GML application schema is required. This would be a “full-complex” GML application schema derived from DGIM with the elements belonging to the IPHG profile. A “full-complex schema” means a schema derived directly from the DGIM UML-model using ISO 19136. However, in most cases, the user does not need the full-complex GML-application schema because data, the use of data, or the user/provider, does not have the capability to ingest or produce data according to the full-complex GML application schema. Therefore, this DPS provides a “flattened” and simplified GML application schema derived from the DGIM using a set of flattening-rules [1].

A flattened schema (and associated Feature Catalogue) is in line with the current IPHG requirements/ways of working, thus the feature schemas and feature catalogue outlined in this DPS are based on a flattened version of the IPHG content profile.

The “flattening” process includes, but is not limited to, the following flattening-rules:

- Flattening inheritance. No abstract feature types are included.
- All modelling associations are removed.

[1] Future versions of this DPS are anticipated to include more complex applications schemas.

- Cardinality of any attribute occurrence is set to a maximum of 30.
- No complex data types in the schema.
- Only the basic geometry types are supported (point, curve, surface).

Table 7 describes the formal items required by this DPS to provide information on the data content and structure for the feature data product produced by this specification.

Table 7: Data product content and structure

Item name	Description
narrativeDescription	unique identifier of data
applicationSchema	the application schema (DGIF Compliant)
featureCatalogue	the feature catalogue (DGIF Compliant)

A Data Product produced from this DPS shall conform to the values below:

- **Narrative Description** The content and structure of this data product shall be in accordance to the relevant one of two flattened application schemas and to a single combined feature catalogue. These are based on a flattened profile conformant to DGIM model (baseline 2021-2).

- **Application Schema** The GML Application Schemas are provided in SDs to this DPS:

  260 SD 1: IPHG Cultural Context Location (IPHG-CCL) GML-Application Schema (.xsd)

  260 SD 2: IPHG Statistical Extent Location Data (IPHG-SEL) GML-Application Schema (.xsd)

  NOTE: The GML application schemas are based on a simplified and flattened version of a DGIM model (baseline 2021-2) profile covering the IPHG CCL and SEL universe of discourse and defined in GML 3.2.1. in accordance with DGIWG-208 (Defence Geospatial Information Framework Encoding Specification - Part 1).

- **Feature Catalogue** The Feature Catalogue is provided in a SD to this DPS:

  260 SD 4: IPHG Data Feature Catalogue (.html).

  NOTE: The single IPHG Feature Catalogue (FC) covers the combined content of the IPHG Cultural Context Location and Statistical Extent Location universe of discourse covered by the two GML schemas. All the features included in the two GML Schemas are part of the FC.

It is based on a flattened version of the 2021-2 Defence Geospatial Information Model (DGIM) IPHG Profile and the relevant related concepts described in the associated Defence Geospatial Feature Concept Dictionary (DGFCD).

The feature catalogue is in accordance with ISO 19110 Geographic information; Methodology for feature cataloguing, provided as an HTML-document.

The name of the feature catalogue is: IPHG Feature Catalogue.

10 Reference Systems

This section specifies the reference systems that shall be used in the data product.

NOTE: Reference system information in this section only applies to open standard Dataset produced conformant to this specification.

Table 8 describes the items required to provide information on the reference systems for a data product produced to this DPS.

Table 8: Data product reference system

Item name	Description
scope	reference to the applicable scope.
spatialReferenceSystem	reference system identifier(s) of spatial reference system used.

A Data Product produced from this DPS shall conform to the values below:

- **Scope** Root Scope
- **Spatial Reference System**
  - **Ellipsoid**
    - **Description** World Geodetic System 1984 (WGS 84).
  - **Horizontal datum**
    - **Description** World Geodetic System 1984 (WGS 84).
    - **Code** 4326
    - **Code space** EPSG
  - **Vertical datum**
    - **Description** Mean Sea Level (MSL) as determined by the appropriate Earth Gravity Model (EGM).
    - **Code** 5100
    - **Code space** EPSG

11 Data Quality

This section identifies the data quality requirements for the data product produced from this DPS including a statement on acceptable conformance quality levels and relevant corresponding data quality measures.

NOTE: The Data quality information in this section only applies to open standard Datasets produced conformant to this specification.

This DPS does not specify any quality requirements about the actual data delivered conformant to the HG schema (e.g. positional accuracy, topology requirements, source validity, etc.). The data quality of the features and attributes incorporated in the application schema carry further data quality information in accordance to the data-creating organisation/programmes extraction/capture documentation (e.g. IPHG).

However, for a data product exchanged in conformant to this DPS, the encoding of the data must be in accordance with, and be validated against, the provided GML application schema as well as the metadata XML application schema.

Information about the quality of the exchanged data should be described in the associated dataset metadata.

11.1 Data Quality Element 1 (Conformance Test)

- **Measure**
  - **Quality Element** Format consistency
  - **Scope** Dataset
  - **Name of** M**easure** Format consistency
  - **Measure Description** Conceptual schema non-compliance
- **Result (Conformance)**
  - **Scope** Dataset
  - **Pass** True
  - **Specification** GML Application Schema-

    International Programme for Human Geography (IPHG) Cultural Context Location (IPHG-CCL) 260 SD1 GML Application Schema, or….

International Programme for Human Geography (IPHG) Statistic Extent Location (IPHG-SEL) 260 SD2 GML Application Schema.

- **Explanation** If any items in the GML file are not compliant with GML ISO 19136-2:2015, this result shall return false.

11.2 Data Quality Element 2 (Conformance Test)

- **Measure**
  - **Quality Element** Conceptual consistency
  - **Scope** Dataset
  - **Name of** M**easure** Conceptual Format consistency
  - **Measure Description** Conceptual schema non-compliance
- **Result (Conformance)**
  - **Scope** Dataset
  - **Pass** True
  - **Specification** GML Application Schema:

    International Programme for Human Geography (IPHG) Cultural Context Location (IPHG-CCL) 260 SD1 GML Application Schema, or….

    International Programme for Human Geography (IPHG) Statistic Extent Location (IPHG-SEL) 260 SD2 GML Application Schema.
  - **Explanation** If any items in the GML file are not compliant with the International Programme for Human Geography (IPHG) Cultural Context Location (IPHG-CCL) 260 SD1 GML Application Schema or International Programme for Human Geography (IPHG) Statistic Extent Location (IPHG-SEL) 260 SD2 GML Application Schema, this result shall return false.

11.3 Data Quality Element 3 (Conformance Test)

- **Measure**
  - **Quality Element** Spatial consistency

- **Scope** Dataset
- **Name of** M**easure** Spatial consistency
- **Measure Description** Spatial non-compliance

- **Result (Conformance)**
  - **Scope** Dataset
  - **Pass** True
  - **Specification** EPSG 4326
  - **Explanation** If any features in the GML file are not compliant with the allowed spatial reference system, this result shall return false.

11.4 Data Quality Element 4 (Conformance Test)

- **Measure**
  - **Quality Element** Conceptual consistency
  - **Scope** Metadata file
  - **Name of** M**easure** Conceptual consistency
  - **Measure Description** Metadata Consistency – compliance

- **Result (Conformance)**
  - **Scope** Metadata file
  - **Pass** True
  - **Specification** DMF XML schema (International Programme for Human Geography (IPHG) 260 SD3 Metadata Schema).
  - **Explanation** If any items in the metadata xml file are not compliant with the International Programme for Human Geography (IPHG)) 260 SD3 Metadata Schema, this result shall return false.

12 Data Production

This section describes information on the capture, inclusion, acquisition or processing of the data contained within the Data Product.

The data production requirements for a data product produced to this DPS is described below:

- **Data Capture Statement** Data capture criteria is out of scope and not defined for this DPS. Data capture, inclusion criteria, or acquisition and processing of information contained within the product is within the remit of IPHG or the data producer.

  NOTE: This DPS only addresses the requirements for concept encoding for application content specification and/or data exchange requirements.

13 Data Maintenance

This section describes information on how the data product is maintained.

Data Maintenance and Update are out of scope and not defined in this DPS. Maintenance and update within the product is within the remit of IPHG or the data producer.

14 Portrayal

This section describes information on how the data product is to be portrayed or presented.

Portrayal is out of scope and not defined in the DPS.

NOTE: This DPS defines a data product/dataset only. How the data is portrayed is portrayal data product is maintained remit of IPHG or the data user.

15 Delivery Information

NOTE: The Delivery information in this section only applies to open standard datasets produced conformant to this specification.

This section defines the requirements of the delivery of a Data Product produced from this DPS. This includes a Delivery Scope, Delivery Format and File naming information.

Table 9 describes the items required to provide the delivery format information for a data product produced to this DPS.

Table 9: Data product delivery format

Item name	Description
formatName	name of the data format.
version	version of the format (date, number, etc).
specification	name of a subset, profile, or product specification of the format.
language	language(s) used within the dataset.
characterSet	full name of the character coding standard used for the dataset.

NOTE: A data product produced in accordance to this DPS will consist of two files; a GML-file with the geographic information (vector data) and an XML-file containing the metadata for the dataset. Individual CCL or SEL datasets will have an individual metadata file.

The details for the items required are described below.

15.1 Delivery Scope Information

- **Delivery Scope** Root Scope (Dataset)

15.2 Delivery Format 1 (Vector Data)

- **Format name** GML
- **Version** 3.2.1
- **Specification** DGIWG-208
- **Language** English
- **Character set** UTF-8

15.3 Delivery Format 2 (Metadata)

- **Format name** XML

- **Version** 1.0
- **Specification** W3C Extensible Mark-up Language (XML) 1.0 (Fifth Edition)
- **Language** English
- **Character set** UTF-8

15.4 File Naming

The structure for naming files according to the IPHG-CCL or IPHG-SEL DPS is defined below:

1. Producer identifier
2. Data Product acronym
3. DPS version
4. Producer allocated numeric/alphanumeric identifier
5. File edition
6. File extension

Example:

GBR_IPHG-CCL_1_0_Syria_EthnicGroupsand Religions_1_2_06_2019_GBR_CAT1_4.gml

(Where "Syria_Ethnic Groups and Religions_1_2_06_2019_GBR_CAT1" represents an IPHG product naming convention example)

16 Additional Information

No additional information statement is provided to this DPS.

17 Metadata

This section lists the metadata specification applicable to an IPHG Dataset. Many of these elements are described more fully elsewhere in this document. This section is to be used as a complete listing for reference purposes.

Metadata for DGIF-compliant data products is defined by a profile of the DGIWG Metadata Foundation (DMF) version 2.0 (DGIWG-114 v2.0.0) which defines both the mandatory and optional metadata elements for a resource, dataset or data series.

Annex A identifies those metadata elements from the DMF that that appear in the IPHG metadata profile.

For details of the relevant Metadata Datatypes and Code list values that support these elements reference should be made directly to DGIWG Metadata Foundation (DMF) version 2.0 (DGIWG-114 v2.0.0).

This metadata will accompany the two defined datasets when exchanged in xml format.

In support of the metadata described above, an XML schema compliant to DMF 2.0 is delivered as part of the IPHG DPS.

The name of the XML schema is: **DGIWG-260 SD3 IPHG Metadata Schema.**

For reference, the following core DMF metadata elements are optional and have been identified as not applicable to this specification:

- RSPURP (Resource Purpose)
- RSTYPN (Resource Type Name)
- THUMB (Resource Thumbnail)
- RSGFLV (Resource Georeferencing Level)
- RSPREF (Resource Representation Form)
- RSSERI (Name of Resource Series)
- RSSHNA (Resource Sheet Name)

Annex A. Update Metadata Elements

The source of the table is DMF version 2.0 (DGIWG-114), except for the examples. The structure of the table is as follows:

- Name: The name of the metadata element.
- Description: Description of the element.
- Cardinality (Card): The number of values this element may represent.
- Data Type: The data type of the element.
- Conformance class: The conformance class as described in DMF version 2.0

Metadata element	Description	Card	Datatype	Confor-mance class
Metadata Set Identifier (MDSID)	This is a value uniquely identifying the original and published versions of the metadata set. Constraint: Mandatory when used in a catalogue. In this case, it should be the value which enables the user to access a metadata set by its identifier. It is usually generated automatically by the catalogue system. Example: b6986b32-1336-487a-8d4d-45b317d8a31f	1	String (UUID)	Core
Metadata Linkage (MDLINK)	This element refers to the online location where the metadata is available. Example: https://portal.dgiwg.org/files/?artifact_id=67339	0..1	URL	Specific
Metadata Default Locale (MDDLOC)	This is the locale in which the metadata elements are primarily expressed. Example: eng	1	Locale (complex data type)	Core
Metadata Responsible Party (MDRPTY)	Information about the party responsible for the metadata. The party.role is usually defaulted to pointOfContact.	1..*	Responsible party (complex data type)	Core

Metadata element	Description	Card	Datatype	Confor-mance class
	The party.orgName can be defaulted to "To be determined" but it is strongly recommended that each organization set up its own default values. Example: Defence Geographic Centre (UK) Email: DGC-Feedback@mod.gov.uk Role: pointOfContact			
Metadata Date Stamp (MDDATE)	The date which specifies when the metadata record was created or updated. Example: 2017-10-12 or 2017-10-12T11:15:00	1	Date or DateTime	Core
Metadata Standard (MDSTD)	This is a citation of the metadata standard to which the metadata set conforms. Constraints: • The values for Metadata Standard (MDSTD) shall be MDSTD.title='urn:dgiwg:metadata:dmf:2.0:profile:all' and MDSTD.version='2.0' for the 'all' profile, MDSTD.title='urn:dgiwg:metadata:dmf:2.0:profile:core' and MDSTD.version='2.0' for the 'core' profile, or the values of one of the registered DMF Profiles: (MDSTD.title='urn:dgiwg:metadata:dmf:2.0:profile:<ProfileName>' and MDSTD.version='<ProfileVersion>').Note: For backward compatibility use MDSTD.title='STANAG 2586' and MDSTD.version='Edition 1' for STANAG 2586 Example: urn:dgiwg:metadata:dmf:2.0:profile:all	1	Citation (complex datatype)	Core
Metadata Security	This element provides a means to express a set of security constraints applicable to the metadata.	0..*	Security Constraint	Common

Metadata element	Description	Card	Datatype	Confor-mance class
Constraint (MDSCST)	Example: NATO Unclassified		(complex datatype)	
Metadata Releasability Addressee (MDREL)	This element establishes bodies to which the metadata can be released. Example: Releasable to NATO	0..*	String In a NATO context, the String value is expected to be a 3-character country codes from STANAG 1059 if available	NATO
Metadata Legal Constraint (MDLCST)	This element provides a means to express a set of legal constraints applicable to the metadata. Example: Copyright	0..*	Legal Constraint (complex data type)	Common
Resource Title (RSTITLE)	This is a characteristic, and often unique name, by which the resource is known. Default value is “To be determined” but it is strongly recommended to find a better and proper title for the resource. Recommendations: • Include an indication on the geographic area covered by the data. • Include the version of the data if several versions are available. • Avoid any reference to a responsible party. • Avoid acronyms or define them (either in the title or in the abstract).	1	Free text	Core

Metadata element	Description	Card	Datatype	Confor-mance class
	Example: Syria_Ethnic Groups and Religions_1_2_06_2019_GBR_CAT1			
Resource Alternate Title (RSALT)	This is a short name, a more colloquial name or a name in another language by which the resource is known. Example: ProductName_MapSerie/ShortName (SAC_M5219A/Sheet2-SouthEastEngland)	0..1	Free text	Core
Resource Abstract (RSABSTR)	This is a brief textual summary of the content of the resource. Default value is “To be determined” but it is strongly recommended to find a better and proper abstract for the resource. Recommendation: • The abstract should include human-readable information to explain the product specificity. Example: This product provides a rapid mapping from MGCP (Multinational Geospatial Coproduction Program) data focusing on Mali.	1	Free text	Core
Resource Type Code (RSTYPE)	This is the type code of the resource described by the metadata: dataset and dataset series, services, tiles and nonGeographicDataset are the only types of resources in the scope of DMF. Fixed value: Dataset.	1	Codelist	Core
Resource Edition (RSED)	This is the version identifier of the resource Example: Ed. 1.	0..1	String	Core
Resource Edition Date (RSEDDAT)	This is the reference date of this edition of the resource (see Resource Edition).	0..1	Date or DateTime	Core

Metadata element	Description	Card	Datatype	Confor-mance class
	Example: 2017-10-12 or 2017-10-12T11:15:00		(complex data type)	
Resource Identifier (RSID)	This is a value uniquely identifying the resource within a specific context. It is highly recommended to provide at least a unique identifier code value (i.e. a code independent of any namespace), typically a URI. Example: code: lakes codeSpace: urn:eu:europa:ec:jrc:rdsi:id:dataset:ccm2.1	1..*	Identifier	Core
Resource Keyword Set (RSKWDS)	Set of keywords used to describe the resource. NOTE: Always include IPHG-CCL or IPHG-SEL in this context. Example: Mali, IPHG-CCL	0..*	String or Controlled Vocabulary	Core
Resource Spatial Resolution (RSSRES)	Factor which provides a general understanding of the density of spatial data in the resource or describes the range of resolution in which a digital resource may be used. NOTE: This element should be repeated when describing the upper and lower range. It is not applicable to non-geo data. Example: 1:50000 or 1:40000 – 1:60000	0..*	Resolution (complex data type)	Core
Resource Temporal Resolution (RSTRES)	Smallest resolvable temporal period in a resource. Example: 2008-01-01T11:45:30 to 2008-12-31T09:10:00	0..*	Interval Length	Common

Metadata element	Description	Card	Datatype	Confor-mance class
Resource Spatial Representation Type (RSRPTP)	This describes the method used to spatially represent geographic information. Fixed value: Vector	0..1	Codelist	Core
Resource Topic Category (RSTOPIC)	The topic category is a high-level classification scheme to assist in the grouping and topic-based search of available spatial data resources. Note: There is no specific topic category defined for topographic dataset and series. The best match is imageryBaseMapsEarthCover code. Examples: • intelligenceMilitary • boundaries • society • disaster	1..*	Codelist	Core
Resource Default Locale (RSDLOC)	The default locale used within the resource. Constraint: RSDLOC.identifier is never set. Fixed value: eng	1	Locale (complex data type)	Core
Resource Other Locale (RSTLOC)	The other locale(s) used within the resource. Constraint: Resource Other Locale identifier is never set. Example: swe	0..*	Locale (complex data type)	Core
Geospatial Information Type (DGITYP)	Information about the type of geospatial information provided by the resource. Fixed value: vector2D	1	Codelist	Core
Resource Theme (RSTHEME)	Theme provides more precise thematic information enabling discovery of data. Note: Name(s) of populated DGIF leaves	0..*	Codelist	Core

Metadata element	Description	Card	Datatype	Confor-mance class
	Example from Agriculture: AgriculturalBuildingsStructures, AnimalLivestockFeatures, AquacultureFishingFeatures, CropLand [should these be HG leaves exclusively for this DPS?]			
Resource Remark (RSREM)	Any remark about the resource.	0..1	String	Common
Resource Format (RSFMT)	This is the description of the computer language construct that specifies the representation of data objects in the producer system (native format of the resource). NOTE: This element may be used to evaluate the impact of the transformation of the data from the Resource Format to the Resource Distribution Format. Although the Resource Distribution Format is in the Core metadata class, the Resource Format stands in the Data metadata class. Constraint: This element should only be used if different from the Resource Distribution Format. Note: Default: GML including version of GML Example: GML 3.2.1	0..1	Format (complex data type)	Data
Topology Level (VCTOLVL)	Code which identifies the degree of complexity of the spatial relationships. Default: planarGraph and Cardinality =1	0..1	Codelist	Data
Feature Catalogue	Description of the feature catalogues	1	Complex datatype	Data

Metadata element	Description	Card	Datatype	Confor-mance class
Description (FCDESC)	Note: For this IPHG FCDESC = “International Program of Human Geography Exchange (IPHG) 260 SD4 Feature Catalogue”			
Resource Extent (RSEXT)	This is either a positional extent, either a temporal extent or a vertical extent. Constraint: One extent of type bounding box or geographic identifier is mandatory. Example:8.07 15.2 57.75 54.56 (bounding box) or Denmark	1..*	Extent (complex datatype)	Core
Resource Reference System (RSRSYS)	This is a spatial or temporal reference system used in the resource. Note: The code property of the identifier should be a URI. Fixed: EPSG code 4326	0..*	Identifier	Core
Resource Status (RSSTAT)	This is information about the status of the resource. Example: completed	0..1	Codelist	Common
Resource Reference Date (RSDATE)	Reference date of the cited resource. The type of date may be creation, publication or revision. Constraints: • When RSTYPE is dataset or series, there should be one creation date. • The resource publication date occurs as many times as the resource has been published. For a service, use the publication date of the service. Example: 2017-10-31 or 2017-05-15 T05:23:30Z	1..*	Date or DateTime	Core
Resource Responsible Party (RSRPTY)	This is the description of the organization(s) associated with the resource, e.g. the originating organization, custodian.	1..*	Responsible party (complex data type)	Core

Metadata element	Description	Card	Datatype	Confor-mance class
	Example: Danish Defence Acquisition and Logistics Organisation Email: fmi@mil.dk Role: originator			
Resource Maintenance (RSMTNC)	This is a set of information about the maintenance of the resource. Example: unknown	0..1	Maintenance information (complex data type)	Common
Resource Security Constraint (RSSCST)	This element provides a means to express a set of security constraints applicable to the resource. Example: restricted	0..*	Security Constraint (complex data type)	Core
Resource Releasability (RSREL)	This element provides a means to express a set of releasability information applicable to the resource. Note: Default value for this element should be set by the implementer's security policy.	0..*	Releasability (complex data type)	NATO
Resource Use Limitation (RSUSE)	This element provides a means to express general use limitations (limitations not implied by security or legal constraints) of the resource.	0..*	String	Core
Resource Legal Constraint (RSLCST)	This element provides a means to express a set of legal constraints applicable to the resource. Example: restricted	0..*	Legal Constraint (complex data type)	Core
Resource Lineage (RSLING)	This is a statement on process history and/or overall quality of the resource. Where appropriate it may include a statement whether the data set has been validated or quality assured, whether it is the official	1	String	Core

Metadata element	Description	Card	Datatype	Confor-mance class
	version (if multiple versions exist), and whether it has legal validity. Example: Data from the wave measurement stations is continuously sent to the Coastal Directorate, where various types of quality control have been performed with the data over time. Users of data should be aware of the varying data quality.			
Resource Regulated Quality Report (RSRQR)	Information related to the result of a quality evaluation following a pre-defined registered data quality measure. A list of predefined quality measure is defined in Annex. It includes positional and vertical accuracy measures, product specification compliancy, and imagery quality measures like NIIRS, snow cover, etc. Note: Depends on the product and a fixed list if used.	0..*	Regulated Quality Report (complex data type)	Common
Resource Unspecified Quality Report (RSUQR)	Information related to the result of an unspecified quality evaluation. Note: Depends on the product and a fixed list if used.	0..*	Unspecified Quality Report (complex data type)	Common
Source of the Resource (RSSRC)	This element provides information about the source data used in creating the resource. Example: Digitized aerial photos	0..*	Source (complex data type)	Common
Resource Process Step (RSPRST)	This element provides information about an event or transformation in the life of a resource including the process used to maintain the resource. Example: Manually digitized	0..*	Process Step (complex data type)	Common

Metadata element	Description	Card	Datatype	Confor-mance class
Resource Usage (RSSPUS)	This metadata element may be used to provide information about the intended usage of the data, or recommendations about how to use the data. For example, the projection in which the data can be displayed. Example: Navigation on land Responsible SDFE Role: producer	0..*	Usage (complex data type)	Common
Resource Distribution Format (RSDFMT)	This is the description of the computer language construct that specifies the representation of data objects in a record, file, message, storage device or transmission channel. Recommended value: GML 3.2.1	1..*	Format (complex data type)	Core
Resource Online Location (RSONLLC)	This element provides the link(s) to the resource and, or the link to additional information about the resource. Example: FTP-server or WFS	0..*	Online Location (complex data type)	Core
Resource Unit of Distribution (RSUD)	This is the description of the unit (tiles, layers, geographic areas, etc.), in which data are available. Example: The geographic area of Sweden	0..1	String	Data
Resource Transfer Size (RSTS)	This is the estimated size of a unit in the specified transfer format, expressed in megabytes. The transfer size is > 0.0 Example: 849,64 MB	0..1	Float	Data
Resource Offline Distribution	Information about offline media on which the resource can be obtained.	0..*	Medium (complex data type)	Data

Metadata element	Description	Card	Datatype	Confor-mance class
Medium (RSOFDM)				