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Geographical names data management

**On geographical names data modelling and transfer
related standards, manuals, or guidelines – some ideas
from the Working Group on Geographical Names Data
Management**

Submitted by Germany **

Summary:

With the following document members of UNGEGN's Working Group on Geographical Names data Management (WG GNDM) have compiled ideas for geographical names data modelling and transfer related standards, manuals, or guidelines.

In chapter one the current status on geospatial information sharing, accessibility, and dissemination related standards are compiled. In chapter two some specific issues related to geographical names data modelling are summarized, comprising the intangible cultural heritage elements that go hand in hand with the physical characteristics relating to location identification for administration, planning, navigation, emergency response, science, resilience, etc. In the chapter three some evaluation notes on UNGEGN's Technical Reference Manual for the National Standardization of Geographical Names, 'Part two, Toponymic data transfer standards and formats' are introduced.

The compilation can contribute and be the rationale for an updated structure for 'Part two. Toponymic data transfer standards and formats' of UNGEGN's 'Technical Reference Manual for the National Standardization of Geographical Names (2007)' or it can be added as an addendum.

The outcome and findings will at least be published within UNGEGN's webpage and its wiki structure.

* GEGN.2/2023/1

** Prepared by Pier-Giorgio Zaccheddu (Germany) on behalf of the Working Group on Geographical Names Data Management

On geographical names data modelling and transfer related standards, manuals, or guidelines – some ideas from the Working Group on Geographical Names data Management

0. Content

With the following document members of UNGEGN's Working Group on Geographical Names data Management (WG GNDM) have compiled ideas for geographical names data modelling and transfer related standards, manuals, or guidelines. It is the outcome of the action item 1-i-2 of "*Evaluate and assess exchange standards for geographical names information and for web services (gazetteer, feature and mapping) for the provision of geographical names information (comprising the review of Part II of the UNGEGN Technical Reference Manual)*" of UNGEGN's Programme of Work. The document shall contribute and be the rationale for the evaluation and assessment for an updated structure for 'Part two. Toponymic data transfer standards and formats' of UNGEGN's 'Technical Reference Manual for the National Standardization of Geographical Names (2007)'.

The discussion paper is structured in three chapters as follows:

1. On geospatial information sharing, accessibility, and dissemination related standards
2. Some specific issues related to geographical names data modelling
3. Some evaluation notes on UNGEGN's Technical Reference Manual for the National Standardization of Geographical Names, 'Part two, Toponymic data transfer standards and formats'
4. Points for discussion

1. On geospatial information sharing, accessibility, and dissemination related standards

1.1. Geographical names as one of the UN-GGIM fundamental geospatial data themes

The United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM) has acknowledged and described 14 global fundamental geospatial data themes – including geographical names – as a foundation to support global geospatial information management, notably used to support the integrated geospatial information framework, among other global initiatives to strengthen geospatial information. The following publication provides key information on the themes and demonstrate what they are, how they can be used, and why they are fundamental:

https://ggim.un.org/meetings/GGIM-committee/9th-Session/documents/Fundamental_Data_Publication.pdf.

The existing general standards for the modelling, sharing, accessibility and dissemination of geospatial information apply to geographical names data in the same way as other geospatial information. However, in the geographical names related information, named places as geospatial objects or features, and place names and their spellings as linguistic properties, are highlighted.

1.2. UN-GGIM activities in the standardization of geospatial information

In the UN-GGIM eleventh session, 23, 24 and 27 August 2021, ISO/TC 211, OGC and IHO jointly introduced a report *Implementation and adoption of standards for the global geospatial information community* ([report](#), [summary](#), [introductory statement](#)). The report introduces a comprehensive [Guide to the role of Standards in Geospatial Information Management](#), the purpose of which is to complement the [Strategic Pathway 6, Standards](#) of the UN-GGIM [Integrated Geospatial Information Framework \(IGIF\) Implementation Guide](#).

Among other essential information on geospatial information standards, the Guide refers to an [Inventory of Standards](#), which provides an up-to-date list of, and links to, some 150 recommended

existing and upcoming geospatial standards, with their purposes and brief descriptions, for each of the four following Tiers:

- Tier 1 – Share maps internally and over the Web
- Tier 2 – Geospatial Information partnerships to share, integrate and use geospatial data from different providers
- Tier 3 – Spatially enabling the nation, large scale (typically national) efforts to develop a comprehensive SDI that provides access to multiple themes of information, applications for using the shared information, and access via a variety of environments (mobile, desktop, etc.).
- Tier 4 – Towards spatially enabled IT infrastructure, delivering geospatial information into the Web of data, and bridging between SDI and a broader ecosystem of information technology systems.

In the UN-GGIM third session, 24–26 July 2013, ISO/TC 211, OGC and IHO jointly introduced a report *Establishment and implementation of standards for the global geospatial information community* ([report](#), [summary](#)). In a comprehensive background document [The UN-GGIM inventory of issues and geographic information standardization](#) 119 standards and their versions then in force were introduced and described.

The number of standards by UN-GGIM issue and standardizing organization were (a standard may be related to several issues):

UN-GGIM issue	ISO	OGC	IHO	Total
(a) Developing a national, regional, and global strategic framework for geospatial information	6	5	1	12
(b) Establishing institutional arrangements and legal and common frameworks	5	2	7	14
(c) Building capability and capacity, especially in developing countries	5	2	2	9
(d) Assuring the quality of geospatial information	7	6	8	21
(e) Promoting data sharing, accessibility, and dissemination	63	24	15	102
(f) Embracing trends in information technology	20	18	3	41
(g) Promoting geospatial advocacy and awareness	0	4	2	6
(h) Working in partnership with civil society and the private sector	0	0	0	0
(i) Linking geospatial information to statistics	7	6	0	13
Total	113	67	38	218

Of the 119 standards 105 concerned the promotion of data sharing, accessibility, and dissemination of geographic information, a typical example of which is geographic names information, which, however, has its own modelling requirements.

The UN-GGIM-issue (e) *Promoting data sharing, accessibility, and dissemination* was further subdivided in the following 13 sub-issues, with sub-sub-issues and corresponding relevant standards listed:

1. Overview
2. Standardizing the geospatial standardization infrastructure
3. Standardizing the data models for geographic information
4. Standardizing the management of geographic information
5. Standardizing the encoding of geographic information
6. Standardizing tightly coupled access to geographic information
7. Standardizing portrayal of geographic information
8. Standardizing web services for geographic information
9. Standardizing digital rights management for geographic information
10. Standardizing geodetic products
11. Standardizing the interface for positioning instruments and devices
12. Standardizing calibration and validation of sensors
13. Standardizing in specific domains of interest

1.3. Examples of general GI data exchange related standards, applications, and software

1.3.1. Interface technologies

- [OGC WFS](#) (Web Feature Service)
- [OGC Filter encoding](#) = [ISO 19143:2010](#), *Geographic information — Filter encoding*
- [OGC APIs](#)
 - [OGC API – Features](#) = [ISO 19168-1:2020](#), *Geographic information — Geospatial API for features — Part 1: Core*

1.3.2. File formats

- [GIS Formats](#)
 - [GML](#), *Geography Markup Language*
 - [GeoJSON](#), *JavaScript Object Notation*
 - [IETF RFC 7946](#)
 - [OGC KML](#), *Keyhole Markup Language*
 - [ESRI Shapefile](#)
 - [Mapinfo TAB](#)

1.3.3. Geospatial data management, integration, and transformation tools

- Extract–Transform–Load (ETL) tools, e.g., [FME](#), *Feature Manipulation Engine*
- [QGIS](#), a free and open-source geographic information system

1.3.4. Database file formats

- [OGC Geopackage](#)
- [SpatialLite](#)
- ESRI [File Geodatabase](#)

1.3.5. Vector tiles

- [Mapbox Vector Tiles \(MVT\)](#)
- [OGC API – Tiles \(Draft\)](#)

1.3.6. [Semantic web](#) & Linked data technologies

- [ISO/TS 19150-1:2012](#), *Geographic information — Ontology — Part 1: Framework*
- [ISO 19150-2:2015](#), *Geographic information — Ontology — Part 2: Rules for developing ontologies in the Web Ontology Language (OWL)*
- [ISO 19150-4:2019](#), *Geographic information — Ontology — Part 4: Service ontology*
- [W3C RDF](#), *Resource Description Framework*
- [W3C OWL](#), *Web Ontology Language*
- [W3C SKOS](#), *Simple Knowledge Organization System RDF Schema*
- [W3C SPARQL](#), *Simple Protocol and RDF Query Language*
- [OGC GeoSPARQL](#)
- [GeoJSON-LD](#)

2. Some specific issues related to geographical names data modelling

The special characteristics of place names data, compared to other geospatial data, are usually related to data modelling needs. The following sections provide some tentative principles for a general conceptual model for place names information as well as the core elements of the model and the interrelationships and key attributes of the elements. The model presented here, in its broadest application, is intended for modelling place name information in a multilingual, multi-names, and multi-scriptural environment.

2.1 Basic conceptual model for geographical names data

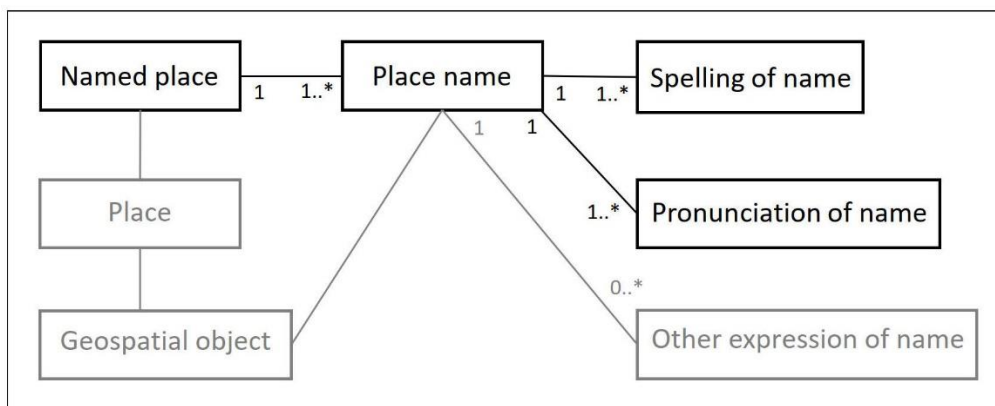


Figure 1 - General conceptual model taken from the European Spatial Data Infrastructure (INSPIRE)

The basic principles of the conceptual model are the following (described in more detail in chapter 2.1.1).

- Named places are a subset of all places. Places may be represented by geospatial data objects
- A named place has at least one and may have up to any number of names
- A place name is related to a single named place and may be related to geospatial data objects representing the place

- A place name has at least one and may have up to any number of spellings (except for non-written languages)
- A place name is related to a single named place
- A spelling is related to a single place name
- A place name may have up to any number of pronunciations

2.1.1 Basic elements, relations, and attributes of the basic conceptual model

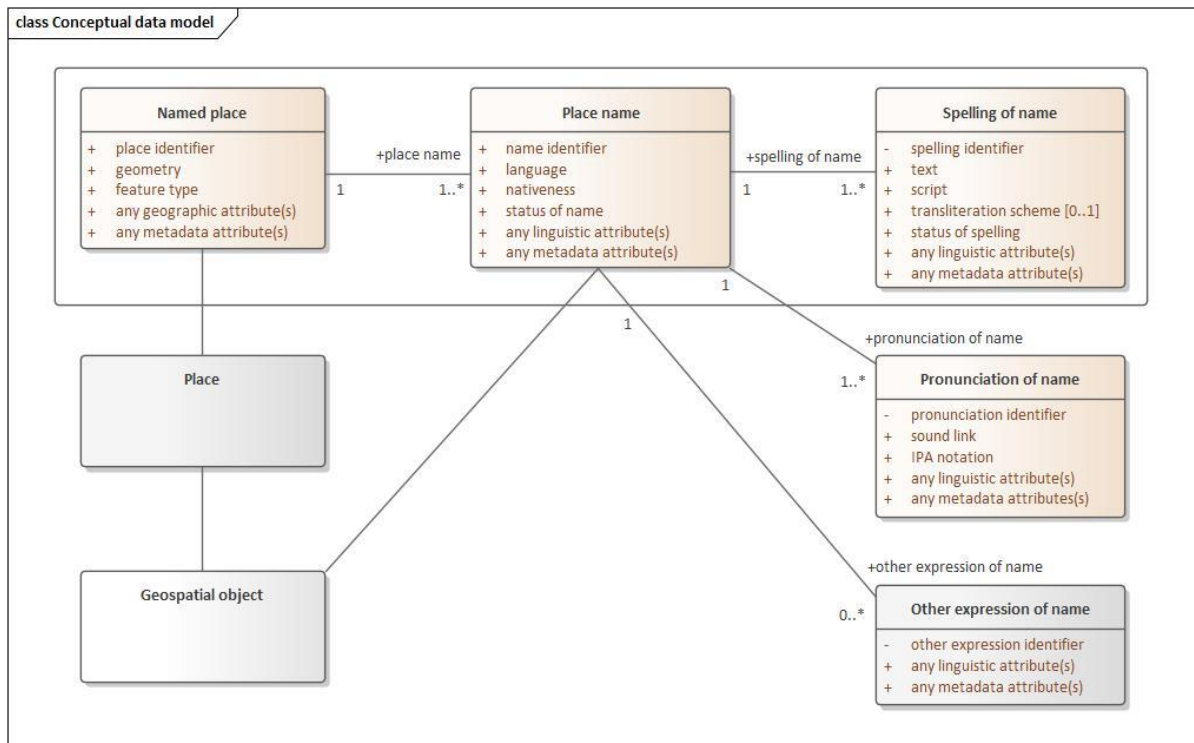


Figure 2 – Conceptual data model taken from the European Spatial Data Infrastructure (INSPIRE)

The basic principles of the elements, relations, and attributes of the basic conceptual model are:

- Named place, place name, spelling of name and pronunciation of name are different concepts and classes with attributes of their own
- Each instance of each class has an identity of its own
- A named place may have one or several names in one or several languages
- A place name may have one or several spellings in different scripts (except for non-written languages)
 - According to the model, all scripts are equal, although in the UNGEGN's applications the 'native' script would take precedence, and romanization is emphasized over any other transliteration or script conversion
- A place name may have unlimited number of pronunciations
- Geometry and feature type are attributes of the place
- Language and 'nativeness' (endonym or exonym) are attributes of the name
- Text (character content) and script are attributes of the spelling

- (Properly executed) transliteration doesn't change the name, the language of the name, or the 'nativeness' of the name
 - *Αθηνά* is a Greek endonym spelled in the Greek script and *Athína* the same Greek endonym spelled in the Latin script. The spelling *Athína* has been converted from *Αθηνά* by using an internationally approved transliteration schema
 - *Athens* is an English exonym spelled in the Latin script

Expressions of a name other than spelling and pronunciation may be irrelevant in this context.

2.2 Place names data modelling related standards, manuals, or guidelines

2.2.1 Modelling

Some current ISO/OGC related references for geospatial data modelling are:

- [ISO 19101-1:2014](#), *Geographic information — Reference model — Part 1: Fundamentals*
- [ISO/TS 19103:2015](#), *Geographic information — Conceptual schema language*
- [ISO 19107:2019](#), *Geographic information — Spatial schema*
- [ISO 19137:2007](#), *Geographic information — Core profile of the spatial schema*
- [ISO 19109:2015](#), *Geographic information — Rules for application schema*
- [ISO 19131:2007](#), *Geographic information — Data product specifications*
- [ISO 19104:2016](#), *Geographic information — Terminology*
- [ISO 19112:2019](#), *Geographic information — Spatial referencing by geographic identifiers*

Other, geographical names and product specific references:

- [INSPIRE Data Specification on Geographical Names](#) (European Commission)
- [Open Regional Gazetteer](#) (EuroGeographics)

2.2.2 Permanent unique identifiers

The data instance identifiers must be permanent and unique within the data set. Together with other identifiers (such as data set identifier), for example a permanent URI can be created, e.g., for 'Linked Data' purposes.

A current ISO/OGC related reference for the generation of universally unique identifiers is:

- [ITU-T X.667 = ISO/IEC 9834-8:2014](#), *Generation of universally unique identifiers and their use in object identifiers*

2.2.3 Metadata

The selection of appropriate metadata elements to depends on the application. Some current ISO/OGC related and other references for metadata for geospatial and geographical names data are:

- [ISO 19115-1:2014](#), *Geographic information — Metadata — Part 1: Fundamentals*
- [INSPIRE Metadata](#)

2.2.4 Named place

Geometry

The “geometries” of named places/features are often vague. Different practices and rationales exist in different countries, data sets and applications. The previously mentioned ISO 19107:2019 introduces geometric primitives point, curve, surface, and geometric complex (combination). File and data exchange formats (e.g., GML, GeoJSON) specify the notations to be used, for example Point, LineString, Polygon. Every named place must have a reference point as its fundamental geometry.

Some current references are:

- [ISO 19111:2019](#), *Geographic information — Referencing by coordinates*
- [EPSG](#), *Geodetic Parameter Dataset*

Feature type

There are all kinds of national feature type catalogues in use. An appropriate feature type classification depends on the application. In the following the overall ISO methodology is provided as well as examples for a general 1st level and 2nd level classification with clear definitions, which could work as a global standard too:

- [ISO 19110:2016](#), *Geographic information — Methodology for feature cataloguing*
- Examples for regional feature type catalogues
 - EuroGeographics Regional Gazetteer – Documentation: https://ome-download-data.s3.eu-west-1.amazonaws.com/open-gazetteer/documents/2022-10-14_OpenRegionalGazetteer_specification.pdf

Any geographic attribute(s)

Appropriate additional geographic attributes depend on the dataset and application. Some current references for geographic attributes for geospatial data (e.g., country, administrative area, (global) grid reference, elevation, another feature type) are:

- [ISO 3166](#), *Country codes*
 - [ISO 3166-1:2020](#), *Codes for the representation of names of countries and their subdivisions — Part 1: Country code*
 - [ISO 3166-2:2020](#), *Codes for the representation of names of countries and their subdivisions — Part 2: Country subdivision code*
 - [ISO 3166-3:2020](#), *Codes for the representation of names of countries and their subdivisions — Part 3: Code for formerly used names of countries*
- M49 Standard: *United Nations Statistics Division*, [Standard country or area codes for statistical use \(M49\)](#)
- [SALB](#), *UN Second Administrative Level Boundaries*
- [ISO 19170-1:2021](#), *Geographic information — Discrete Global Grid Systems Specifications — Part 1: Core Reference System and Operations, and Equal Area Earth Reference System*

Any metadata attribute(s)

Metadata for the entire dataset or product or delivery may be sufficient, depending on the dataset and application. Feature specific metadata might be introduced if appropriate, e.g., source of the geometry, data source, life span information.

2.2.5 Place name / Geographical name

UNGEEN manuals and guidelines on the standardization of geographical names are found here: <https://unstats.un.org/unsd/ungegn/pubs/>.

UNGEEN acknowledges that UN-GGIM seeks data specifications that follow agreed standards which are interoperable between UN-GGIM's fundamental data themes. Beyond that, UNGEEN would also like to impress an important aspect of geographical names; that is the intangible cultural heritage elements that go hand in hand with the physical characteristics relating to location identification for administration, planning, navigation, emergency response, science, resilience, etc. The sense of place, identity (both individual and collective), nation building, commemoration, language and story that go with each geographical name offer insights into much more than the 'data structure' within which this information sits. The treasure that this information reflects can be difficult to quantify, but it can elevate peoples' status and connection to the land they are part of – their place to stand and what they seek to preserve and sustain. Cultural heritage data is not owned by those who capture it, but by those people who named those places. Therefore, an element of respect and sensitivity needs to be attributed to that cultural heritage to ensure its accuracy and authenticity from the people of the place. In making this information discoverable consideration should be given to ensure the safety of sensitive cultural heritage data, ie. ensuring that the people of the place are comfortable with the level of cultural heritage data provided about their place names. In doing this, a shared and positive outcome between geographical naming authorities is that equal attention to cultural heritage translates to acceptance, celebration and longevity of place names within communities.

According to the conceptual model, each named place is associated with one or several geographical names. The different geographical names of one given spatial object may be, for example, parallel names in one or different languages, or names in different forms (e.g., complete, and short forms of country and administrative unit names).

Language

The current references for language codes to be used for geospatial data are:

- [ISO 639](#), *Language codes*
 - [ISO 639-1:2002](#), *Codes for the representation of names of languages — Part 1: Alpha-2 code*
 - [ISO 639-2:1998](#), *Codes for the representation of names of languages — Part 2: Alpha-3 code*
 - [ISO 639-3:2007](#), *Codes for the representation of names of languages — Part 3: Alpha-3 code for comprehensive coverage of languages*
 - [ISO 639-4:2010](#), *Codes for the representation of names of languages — Part 4: General principles of coding of the representation of names of languages and related entities, and application guidelines*
 - [ISO 639-5:2008](#), *Codes for the representation of names of languages — Part 5: Alpha-3 code for language families and groups*
- SIL International, [ISO 639 Code Tables](#), all ISO 639 parts in a single table

During the development of the EU INSPIRE *Data Specification on Geographical Names – Technical Guidelines*, the different versions of ISO 639 standards were evaluated. The conclusion of the evaluation was: “Language is a major aspect of geographical names, and the choice of most appropriate codes received much attention during the preparation of this specification. The only solution enabling to code languages with sufficient details, but also enabling to code languages family as existing in some actual data sets, appeared to be a combination of the non-conflicting codes of ISO 639-3 and ISO 639-5.”

Nativeness (endonym or exonym)

The simplest way of dealing with ‘nativeness’ is the differentiation of a geographical name in two options: as ‘endonym’ or ‘exonym’. There are endonyms (names given by native / local people) and other names (exonyms), not given by native / local people. A third option besides endonym and exonym may be considered as some types of toponyms are discussed (e.g., names in Antarctica, undersea features...). The current definitions for endonym and exonym agreed by UNGEGN are:

Endonym:

Name of a →geographical feature in an official or well-established language occurring in that area where the feature is situated. Examples: Vārānasī (not Benares); Aachen (not Aix-la-Chapelle); Krung Thep (not Bangkok); Al-Uqşur (not Luxor).

Exonym:

Name used in a specific language for a →geographical feature situated outside the area where that language is widely spoken, and differing in its form from the respective →endonym(s) in the area where the geographical feature is situated. Examples: Warsaw is the English exonym for Warszawa (Polish); Mailand is German for Milano; Londres is French for London; Kūlūniyā is Arabic for Köln. The officially romanized endonym Moskva for Москва is not an exonym, nor is the Pinyin form Beijing, while Peking is an exonym. The United Nations recommends minimizing the use of exonyms in international usage. See also →name, traditional.

Status of name

An appropriate list of status values depends on the data set, and the scope and application of the data set. For example, the four types of the European INSPIRE Specification (official, standardized, historical, other) may not be appropriate or sufficient for other purposes and applications. It would be useful to learn about different practices and their rationale in different countries, data sets and applications.

Any linguistic attribute(s)

Possible or appropriate attributes, such as etymology, may depend on the application. For example, the INSPIRE data specification recognizes the linguistic gender and linguistic number as attributes.

Any metadata attributes(s)

According to the dataset and application, name specific metadata, e.g., source of name, life span information, can be considered, i.e., attributes that can have different values by object/feature.

2.2.6 Spelling of name

Each geographical name may have one or several spellings, i.e., proper ways of writing it, in one or several scripts, like the Latin/Roman, Greek and Cyrillic scripts. All original and correct spellings shall be retained, for example, no omission or transformations of diacritical characters should be allowed.

An example:

- The city of Athens is the named place
- The endonym “Athína” (Greek language) and the exonym “Athens” (English language) are two different geographical names of this unique named place
- “Aθnva” (Greek script) and its standard romanization “Athína” (Latin script/Romanized form) are two different spellings of the same geographical name “Athína”

At present, the UNGEGN *Glossary of Terms for the Standardization of Geographical Names* doesn’t recognize spelling as a separately defined or described term.

Text (character content)

The current references for character content are:

- [35.040.10](#), ISO, *Coding of character sets*
 - [ISO/IEC 10646:2020](#), *Information technology — Universal coded character set (UCS)*
 - [ISO 8859](#) family (8-bit character encoding)
- [Unicode Standard, latest version](#) (now 15.0)
 - [Relation](#) between ISO/IEC 10646 and Unicode (according to the Unicode Consortium)
- [Letter database](#), Eesti Keele Instituut, *Characters (“non-English”) needed to write a certain language in the Latin script*
 - Also sets requirements for the realized character content of fonts to be used

Script

The current references for scripts are:

- [ISO 15924:2022](#), *Information and documentation — Codes for the representation of names of scripts*
- [Codes for the conversion of names of scripts](#), the same ISO codes provided by Unicode

Transliteration scheme

The current references for transliteration schemes are:

- [01.140.10](#), ISO, *Writing and transliteration*
- [ISO TC46 /WG3 Conversion of Written Languages](#)
- [BGN/PCGN Romanization systems](#)
- [UNGEGN WG on Romanization Systems](#)
- [Library of Congress Romanization Tables](#)

Status of spelling

Possible references to, for example, an official or approved orthography for a certain language, could be made.

Any linguistic attribute(s)

Possible / appropriate attributes may depend on the application or may be irrelevant.

Any metadata attribute(s)

Possible / appropriate attributes may depend on the application or may be irrelevant.

2.2.7 Pronunciation of name

Pronunciation standards are not available for the time being. No notable references can be made.

Sound link

Sound / Audio files are to be considered.

IPA notation

IPA is the best (only) way of systematically recording pronunciation:

- [Handbook of the IPA](#)

Any linguistic attribute(s)

Further linguistic attributes are not considered for the time being. No notable references can be made.

Any metadata attribute(s)

Further metadata attributes on pronunciation, e.g., pronunciation specific metadata like automatized / human voice, or the native language or dialect of the human pronouncer, are not considered for the time being.

2.2.8 Other expression of name

Any other expression of a name, e.g., signs in sign languages, Morse code, maritime signal flags etc. are not considered for the time being.

3. Some evaluation notes on UNGEGN's Technical Reference Manual for the National Standardization of Geographical Names, Part two, Toponymic data transfer standards and formats

3.1 Short description of Part two of the Manual

Part two of the Manual includes the following parts:

- Introduction
- Annex A. Master list of Roman characters
- Annex B. Section I. List of countries, languages and writing systems
- Annex B. Section II. Tables of characters
- Annex C. Draft toponymic data exchange standard

The Introduction includes the history and rationale of Part two, both dating back to the 1990s. It also lists the international text encoding standards then examined, talks about considerations on the content and format requirements for the toponymic data itself as well as for the data about the data (the metadata), which are essential for the sufficient transfer, understanding and utilization of the names data.

Annex A provides a list of Roman characters needed to write names in different languages. The list is based on the Unicode Standard, Version 5, 2007. The table includes the character, the name of the character, ISO/Unicode hexadecimal code of the character, and a language specific Basic Roman extension reference to the *List of countries, languages and writing systems* in Annex B, Section I, and to the *Tables of Characters* in Annex B, Section II (for example reference code smn: what characters other than Basic Roman characters are needed to write Inari Saami names).

Annex B, Section I, provides a list of countries, languages in the country in which geographical names are likely to occur, writing systems used for particular languages, romanization system(s) for non-roman script names, and a table of Basic Roman extension reference to Annex A and Annex B, Section II.

Annex B, Section II, provides a list of the Basic Roman characters and lists of characters needed to write names in different languages not covered by the Basic Roman system. The tables are arranged by the Basic Roman extension reference, for example *Table smn* list the characters beyond the Basic Roman system needed to write Inari Saami names. The tables also show in which 8-bit ISO 8859 standard version each character appears, if any.

Annex C, Draft toponymic data exchange standard, includes three parts:

- Part 1 Data elements
- Part 2 Metadata
- Part 3 Illustration

Part 1 lists the minimum set of critical geographical names information for digital exchange, identified in Resolution 4 of the first United Nations Conference on the Standardization of Geographical Names (1967), including geographical name (spelling), feature type, location, administrative area (country, administrative unit within the country), and map sheet reference.

Part 2 introduces the concept of metadata in general and some typical examples of metadata elements. It also refers to Part 15 of the ISO 15046 draft standard (since been cancelled and replaced by ISO 19115).

Part 3 gives an illustrative example of the application of the information provided in Annex C.

3.2 Some preliminary remarks on Part two of the Manual

Concerning Annexes A, B/1 and B/2, much of the (partly outdated) information is probably available up-to-date and online in different UN/UNGEKN/ISO as well as other sources. An example is the [Letter database](#), now maintained by Eesti Keele Instituut.

Concerning Annex C, the information dates to the late 1990s and early 2000s. Today, regarding standardization, geographical names information can be considered geospatial information as any other, although the names information has its own modelling requirements. Thus, the documentation and promotion of any existing and upcoming GI standards is (and should be) already well covered and coordinated through UN-GGIM activities (Chapter 1), although some linguistic standards seem to be forgot.

To introduce specific standards or guidelines for geographical names data modelling and transferring, a concrete reference application would be necessary. This would mean a certain source dataset and/or target dataset (e.g., World Geographical Names Database, European Open Regional Gazetteer). Or the application could be a harmonized data exchange schema for distributed services (e.g., INSPIRE data product specifications). Today, all kinds of GI data transformations and the use of corresponding tools are commonplace, including database schema, data transfer schema, data format, coordinate system and character encoding system transformations.

Concerning some specific geographic names data attributes, such as feature types and statuses of names, the appropriate approach depends on the application too because there is no “one size fits all” solution.

Consideration should be given to whether an authoritative Manual (Annex C) is needed today, or whether the presentation of good practices in, for example, working papers or as part of training material could be a better way to do the same.

4. Points for discussion

The Group of Experts is invited to:

- (a) Express its views on the ideas presented in the discussion paper on (1) ‘geospatial information sharing, accessibility, and dissemination related standards’ and (2) ‘Some specific issues related to geographical names data modelling’.
- (b) Express its support for the evaluation notes under (3) on ‘UNGEKN’s Technical Reference Manual for the National Standardization of Geographical Names, Part two, Toponymic data transfer standards and formats in the discussion paper’ (2007).

- (c) Request the 'Working Group on Geographical Names Data Management' to involve standardization bodies to provide input and comments.
- (d) Endorse the 'Working Group on Geographical Names Data Management' to take action on the publication of the content of the discussion paper in any of the ways indicated below until the fourth UNGEGN session:
 - i. Publish 'discussion paper' "as is" on UNGEGN's website and Wiki or;
 - ii. Add chapter (1) and (2) as an addendum to the current 'Part two. Toponymic data transfer standards and formats';
 - iii. Elaborate chapter (1) and (2) further to an updated structure and content for the Technical Reference Manual.