



Definitions and descriptions of the spatial data themes of Croatian NSDI, Annex I and II

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1. Introduction

Spatial data themes of Croatian National Spatial Data Infrastructure are defined with the National Spatial Data Infrastructure Act (OG 56/13). Spatial data themes are divided in three annexes. In this document are given definitions and descriptions for Annex I and II spatial data themes. They are aligned with the INSPIRE spatial data themes. Definitions and descriptions are given for the spatial data themes:

Annex I:

1. Coordinate reference systems
2. Geographical grid systems
3. Geographical names
4. Administrative units
5. Addresses
6. Cadastral parcels
7. Transport networks
8. Hydrography
9. Protected sites
10. Data on mines suspected area

Annex II:

1. Elevation
2. Land cover
3. Orthoimagery
4. Geology

2. Annex I

2.1 Coordinate reference systems

Definition:

Systems for uniquely referencing spatial information in space as a set of coordinates (x, y, z) and/or latitude, longitude and height, based on a geodetic horizontal and vertical datum.

Description:

The theme establishes a structure for spatial referencing of features by coordinates. This topic shall link to appropriate standards for information technology and data where possible, and provide a framework for the development of sector-specific applications using geographic data.

ISO 19111 describes the conceptual schema and defines the description for a minimum data to two cases for which 1-, 2- and 3- dimensional coordinates reference system information shall be given. The first case is given by a coordinate reference system to which a set of coordinates is related. The second case consists of a coordinate operation (coordinate transformation, coordinate conversion, concatenated coordinate operation) to change coordinate values from one coordinate reference system to another.

There are no explicit accuracy numbers given in ISO 19111. We must consider that it has been developed for geographic information in general, but not for precise positioning. Spatial information may be referenced to the Earth surface with an improving accuracy on the global scale for the future. Such high accuracy level may be required for some themes of the INSPIRE Directive, e.g., the trans-European railway transport network. Spatial referencing could no longer be considered as constant in time, if we reach the sub-centimeter level. We need additional parameters compared to ISO 19111 in that case, because that document considers changes in time of the coordinate reference only system through the “date of realization”. This model is not suitable to describe continuous movements of the spatial reference. Kinematic models or so-called “loading models” are examples to incorporate such dynamics. A re-iteration of accuracy aspects may be needed, if specifications for Annex I and II are ready.

The spatial referencing is usually referred to selected points of the Earth surface. Such points are, e.g., given by geodetic markers, stations performing permanent satellite observations, leveling benchmarks or tide gauges. As soon as the marker coordinates are given, they provide a direct access to the realization of the coordinate reference system.

More information about this subject could be found on the INSPIRE web site http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/INSPIRE_Specifications_CRS_v3.1.pdf

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2.2 Geographical grid systems

Definition:

Harmonized multi-resolution grid with a common point of origin and standardized location and size of grid cells.

A grid for representing thematic information is a system of regular and geo-referenced cells, with a specific shape and size, and an associated property.

Description:

Geographical grids are an agreed, defined and harmonized grid net for Pan-Europe with standardized location and size of grid cells. Examples of cell sizes could be 10x10 m, 100x100 m, 1x1 km, and 16x16 km.

The grid proposed as Pan-European standard is based on the ETRS89 Lambert Azimuthal Equal Area coordinate reference system with the centre of the projection at the point N 52°, E 10°. Other grids could be also used; however they need a lot of harmonization work, as well as a number of conversion tools. Some international organizations perform their operations, using their own and purpose-oriented grid construction.

More information about this subject could be found on the INSPIRE web site http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/INSPIRE_Specifications_GGS_v3.0.1.pdf.

2.3 Geographical names

Definition:

Names of areas, regions, localities, cities, suburbs, towns or settlements, or any geographical or topographical feature of public or historical interest.

Description:

Geographical names or place names describe features on Earth – a location or a landscape object, on land as well as on sea. Often the term topographical name is used to emphasize the spatial dependency and relation to the adjacent topographical features.

The geographical names on a specific landscape object can be different in the different languages. Multilingual aspects should be covered in the data sets. In some datasets their primary purpose is to depict geographical locations and in others they may be attributes, and of secondary importance. Geographical names should in both cases be provided in the official form(s) and language(s) of the country, including the minority language(s).

More information about this subject could be found on the INSPIRE web site http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecifications_GN_v3.0.1.pdf.

2.4 Administrative units

Definition:

Units of administration, dividing areas where Member States have and/or exercise jurisdictional rights, for local, regional and national governance, separated by administrative boundaries.

Description:

Official administrative units should be provided according to the administrative levels used within each country. Each national territory is divided into administrative units. The administrative units are divided by administrative boundaries. The definition has been interpreted not to include administrative units such as census districts, post office regions and other sector-specific regions. Administrative units and administrative boundaries form a partition of space.

More information about this subject could be found on the INSPIRE web site http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecifications_AU_v3.0.1.pdf.

2.5 Addresses

Definition:

Location of properties based on address identifiers, usually by road name, house number, postal code.

NOTE: besides road names, house number and postal code, any other component is a geographical name (city, town, village, suburb/municipality, admin units).

Description:

An address is an identification and abstract concept expressing the fixed location and path of access of a home, business or other building or land parcel (real property). The full address identification is a hierarchy consisting of components such as geographic names, with increasing level of detail, e.g. town, street name, address (or building) numbers in addition to the postal code. Addresses serve several purposes, such as their use in the delivery of mail. There are a lot of functions of addresses: location function (e.g. for visits or the delivery of mail), identification function (e.g. in context of a building registration), jurisdiction function (e.g. which authority is responsible for object attached to address), and sorting and ordering function.

Under real property a number of different objects types can be identified: land parcels, buildings (including apartments), but sometimes also other types such as utilities. For (apartment-) buildings there is in most cases an association with an address. In rural areas there exist buildings without a complete postal address, e.g. only town and street name and no house number. Same in urban areas: e.g. utility service buildings. Note: the registration of the addresses is currently not harmonized within Europe. Other „nonbinding“ objects that might have addresses include sport's grounds, (official) location of a mobile home (house trailer, caravan) or the location of a houseboat (mooring place).

More information about this subject could be found on the INSPIRE web site http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecifications_AD_v3.0.1.pdf.

2.6 Cadastral parcels

Definition:

Cadastral parcel is part of a cadastral municipality and cadastral areas at sea, determined by the number of cadastral parcel and its limits.

The parcel definition of WPLA (Working Party on Land Administration) published in the document „Guidelines on Real Property Units and Identifiers“ is the following:

A single area of land or more particularly a volume of space, under homogeneous real property rights and unique ownership.

Remark: By unique ownership is meant that the ownership is held by one or several owners for the whole parcel. By homogeneous property rights is meant that rights of ownership, leases and mortgages affect the whole parcel. This does not apply to specific rights as servitudes which may only affect part of the parcel.

Description:

The Cadastre is defined as a register under the responsibility of the government. Access to cadastral information is ruled by laws and regulations in order to protect the personal information. The Cadastre basic unit is the parcel. Parcels can be grouped in register units. A parcel has a unique real property identifier (number of cadastral parcel). The spatial description of the parcels and other cadastral objects is provided with an adequate degree of accuracy. Descriptive data may include the nature, size, value and legal rights or restrictions associated with each separate land object under or over the surface. Cadastral parcels should cover a territory nationwide and there should be no overlaps or gaps (in reality). An exception to this rule may be government land (or public domain) not registered within the Cadastre (though this is not recommended practice).

More information about this subject could be found on the INSPIRE web site http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecifications_CP_v3.0.1.pdf.

2.7 Transport networks

Definition:

Road, rail, air and water transport networks and related infrastructure. Includes links between different networks. Also includes the trans-European transport network as defined in Decision 1692/96/EC of the European Parliament and of the Council of 23 July 1996 on Community guidelines for the development of the trans-European transport network and future revisions of that Decision.

Description:

The transport component should comprise an integrated transport network, and related features, that are seamless within each national border. In accordance with article 10.2 of INSPIRE Directive, national transport networks may also be seamless at European level, e.g. connected at national borders. Transportation data includes topographic features related to transport by road, rail, water and air. It is important that the features form networks where appropriate, and that links between different networks are established, e.g. multi-modal nodes, especially at the local level, in order to satisfy the requirements for intelligent transport systems such as location based services (LBS) and telematics. The transport network should also reflect the transport flow to enable our navigation services.

Route is a kind of abstract or invisible objects describing the spatial services offered within a transport system. Bus routes, ferry lines, bicycle routes may be examples of route information. Commonly links or segments of a transport system is brought together to form a route, but may exist as separate feature data. It should be clarified if such data are included within this theme or if not, how one through the NSDI data and services can support such route information.

More information about this subject could be found on the INSPIRE web site http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecifications_TN_v3.1.pdf.

2.8 Hydrography

Definition:

hydrographical elements, including marine areas and all other water bodies and items related to them, including river basins and sub-basins. Where appropriate, according to the definitions set out in Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy, and in the form of networks.

Description:

The theme „Hydrography“ covers the network of rivers, lakes and marine areas. „Static“ features are in the „Hydrography“ theme, „dynamic“ features such as water levels are in related themes in Annex 3.

Theme also includes the river basins. River basin, as defined in the Water Framework Directive, Art 2, Annex I and II, means the area of land from which all surface run-off flows through a sequence of streams, rivers and, possibly, lakes into the sea at a single river mouth, estuary or delta. Sub-basin means the area of land from which all surface run-offs flows through a series of streams, rivers and, possibly, lakes to a particular point in a water course, normally a lake or a river confluence.

Groundwater is also an important part of the hydrological cycle of water, but is treated under the Annex theme Geology.

More information about this subject could be found on the INSPIRE web site http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecifications_HY_v3.0.1.pdf.

2.9 Protected sites

Definition:

Area designated or managed within a framework of international, Community and Member States' legislation to achieve specific conservation objectives.

Description:

Areas with certain protection targets defined by sectors. Many of the categories refer to conservation of nature, but could also refer to other objectives, e.g. fishing or forest resources, or cultural heritage objects or areas. Nature protection may be linked to certain landscapes, habitats or species. Protected areas may be located in terrestrial, aquatic or marine environments. Protected sites differs from environmental founded classifications of natural or cultural resources and objects, as localization, boundary and area of protected sites are based on formal, legal or administrative agreements/decisions.

More information about this subject could be found on the INSPIRE web site http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecifications_PS_v3.1.pdf.

2.10 Data on mines suspected area

Definition:

Areas and/or buildings that are determined by general survey as suspected or not used because of possible or real existence of Suspected Explosive Devices (SED) or Unexploded Ordnance.

Description:

Areas of Croatia on the territory of armed conflict or wider, for which there are different kinds of information on contamination by Suspected Explosive Devices (SED) or Unexploded Ordnance (UO). Borders of Mines Suspected Area (MSA) are defined in the Croatian Mine Action Centre (CMAC) using prescribed professional methods. Appropriate markings, mine threat, marked by MSA are further used as the basis for all other mine action activities in the area, with the ultimate goal of obtaining, from the SED and UO, secure areas. CMAC inform all interested users of areas about mine suspected areas on which the law obliges.

For faster and better information CMAC Geoportal (web site) was put into operation, it provides public insight into the view of the Mines Suspected Area.

More information about this subject could be found on the web site <http://www.hcr.hr> and <https://misportal.hcr.hr/>.

3. Annex II

3.1 Elevation

Definition:

Digital elevation models for land, ice and ocean surfaces. It includes terrestrial elevation, bathymetry and shoreline.

Description:

The theme includes:

- Terrestrial elevation, generally represented as
 - the terrain data, ground surface topography, called Digital Terrain Model describing the three-dimensional shape of the Earth's surface,
 - the surface data, named Digital Elevation Model, including the three dimensional shape of every feature placed on the soil (buildings, bridges, trees, ...).
- Bathymetry, e.g. a gridded bottom model

The height will be according to a common vertical coordinate reference system. The current one is European Vertical Reference System 2000 (EVRS2000), but EVRS 2007 is under development and might be taken into account or mentioned (cf. resolutions of the EUREF Symposium in London, 06-09 June 2007).

More information about this subject could be found on the INSPIRE web site http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecifications_EL_v3.0_rc3.pdf.

3.2. Land cover

Definition:

Physical and biological cover of the Earth surface including artificial surfaces, agricultural areas, forests, (semi-) natural areas, wetlands, water bodies.

Description:

Land cover data is a physical or biological description of the earth surface. In this way it is different from the land use data (Annex III, theme number 4), dedicated to the description of the use of the Earth surface.

Land cover information has to be homogenous and comparable between different locations in Europe, based on the infrastructures for Land Cover information created by the Member States (if existing), and made available and maintained at the most appropriate level.

Directorate-General for the Environment, DG ENV, among other Directorate-Generals, DG, together with 37 participating countries are financing and implementing the European multi-annual land cover database, within the framework of the Global Monitoring for Environment and Security, GMES, precursor Fast Track Service on Land Management and as the result of the users' requirements at national and European levels.

More information about this subject could be found on the INSPIRE web site http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecifications_LC_v3.0_rc3.pdf.

3.3 Orthoimagery

Definition:

Geo-referenced or ortho-referenced image data of the Earth surface, from either satellite or airborne sensors.

Description:

An orthoimage is a raster image that has been geometrically corrected (orthorectified) to remove distortion caused by camera optics, camera tilt, and differences in elevation. Source is either satellite or air-borne sensors. Data is orthorectified to achieve an accuracy commensurate with a given topographic map equivalent.

More information about this subject could be found on the INSPIRE web site http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecifications_OI_v3.0_rc3.pdf.

3.4 Geology

Definition:

Geology characterized according to composition and structure. Includes bedrock, aquifers and geomorphology.

Description:

Geological information provides basic knowledge about the physical and chemical composition and the genesis of the underground, in particular on the properties of the rocks and sediments (age, petrography, genesis and tectonic elements ...) and their structure.

More information about this subject could be found on the INSPIRE web site http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecifications_GE_v3.0_rc3.pdf.