



UN-GGIM: EUROPE – A on EUROPEAN CORE DATA Report for UN-GGIM: Europe 2nd Plenary Meeting

Table

I. Presentation of the Core Data concept of UN-GGIM: Europe	1
II. Methodology and Progress of Work Group A	2
III. Spatial and temporal data resolution.....	3
IV. Scoping of Core Data for “technological and natural hazard prediction” usages.....	4
V. Scoping of Core Data for “availability of natural resources and maintenance of biodiversity” usages	7
VI. Scoping of Core Data for “sustainable economy and facilities” usages.....	15
VII. Description of core data selected for sustainable development usages	19
VIII. Proposed next stages and areas for improvement	23

I. Presentation of the Core Data concept of UN-GGIM: Europe

This section presents the core data concept as stated by the UN-GGIM: Europe Regional Committee¹ and the corresponding objective assigned by this Committee to Work Group A (WG A).

Core data can be defined as the minimum set of authoritative data, following a bottom-up approach from authoritative data of member states, and needed to meet common requirements for applications at cross-border, European and global levels. It means that the requirements which are common to member states should be considered.

Core data can be seen as the authoritative, harmonised and homogeneous framework data which both national (including sub-national and local) and international (European and global) users need to either fulfil their requirements or to geo-reference and locate their own thematic geospatial data.

Core data may at least be used as a skeleton i.e. a minimum framework on which other richer, more detailed, more thematic geospatial and statistical data would rely. In this way, core data would facilitate the production and support the quality and geometrical consistency of other data. This would very much favour interoperability and combinations between many different datasets. Besides, a geodetic framework is the underpinning reference control for all of the core data groups and themes.

WG A aims at identifying essential data for sustainable development i.e. the core data needed by UN, European and national activities related to sustainable development, in order to get political and financial support to fulfil this need. This is a vast scope of use, hence a core list is required to balance the long term

¹ Cf. 2014 Report by the Preparatory Committee on the establishment of the UN-GGIM: Europe Regional Committee.



user needs in all relevant sectors with the possibility for realizing the core data, and with the need to simplify and prioritize for easy communication to decision makers.

In pursuing these common goals, countries and national institutions need to be assured that counterparties are able and willing to provide authoritative data. Whilst world class internet companies provide users with alternate routes for limited functions that core data will fulfil, the quality, source and update cycle of these products is not known. By contrast, the concept of authoritative core data proposed by WG A entails setting up precise specifications and requires clear knowledge of data compliance with the specifications.

II. Methodology and Progress of Work Group A

Fifteen European UN Member States (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Netherlands, Norway, Poland, Spain, Sweden, Switzerland, Turkey, United-Kingdom) and three observers (Joint Research Centre, European Environment Agency and EuroSDR) participated in WG A, coordinated by France.

II.1. Assessment of core data needs for sustainable development

Sustainable development is a broad term. In order to operationalize the assessment, the UN Sustainable Development Goals (SDG) have been taken as the basis for the assessment. They have led WG A to structure usages by identifying three major usage themes:

- Technological and natural hazard prediction;
- Availability of natural resources and maintenance of biodiversity;
- Sustainable economy and facilities.

WG A defined a common excel sheet template for analysing user requirements and for drafting a list of core data themes. This template requires first investigating user requirements per SDG target. Then it required compiling requirements by indicating for each core data theme its scale or accuracy, its other specifications (feature types or attributes), its justifications and references (especially in terms of legislations), and its level (Local level - management - high-scale data, medium level - middle-scale data, strategic level low-scale data).

II.2. Integration of INSPIRE works in the methodology

WG A acknowledges the importance of the specification works carried out by the European Union for setting up the INSPIRE Directive. Therefore, WG A focuses upon using these specifications as a relevant background whose analyses may be picked up for specifying core data.

The methodology requires analysing INSPIRE data specifications in order to use INSPIRE feature types and attributes to consolidate the user requirements analysis and to define more accurately core data, and to use INSPIRE use cases to justify user requirements.

INSPIRE specifications will be reused as much as possible to specify core data: The INSPIRE subset which meets user requirements for core data will be retrieved; Core data themes, feature types and attributes will be selected within INSPIRE data specifications; Quality criteria for this subset will be defined farther than current INSPIRE specifications in order to foster data homogeneity.



Integration of INSPIRE in the methodology will facilitate later implementation of core data within the INSPIRE infrastructure and within the European Location Framework (ELF) platform.

II.3. Use of national conceptions of core data

The methodology also requires the member states participating in WG A to present the national conceptions of core data in their respective countries.

Last, both the compiling of core data themes and the consideration of national conceptions of core data will lead to draft proposals scoping minimum core data required by SDGs.

II.4. Progress of Work Group A

The participants were distributed into three sub-groups – coordinated by France, Sweden and UK – which have analysed the user requirements respectively pertaining to the three major usages themes mentioned in § II.1, by pooling key European and national documents, by assessing the required geospatial data in terms of specifications and accuracy, by justifying such assessments through existing legislations and by comparing national core data specifications.

The three subgroups have populated their respective excel sheets with requirements and explanations. These excel sheets will keep on being used, and this paper will focus on giving an overview of the main results and forthcoming issues to be tackled. Requirements have been assessed in the excel sheets according to their importance level.

From this user requirement analysis, WG A has scoped core data and has drafted a list of core data by focusing upon the requirements having “critical” or “important” importance level.

III. Spatial and temporal data resolution

III.1. Detail Levels of Core Data

A crucial issue when defining a list of core data is to identify their level of use. Who will use the data and for what purposes? Geospatial information needs can roughly be divided into three levels:

III.1.a. Geospatial data for policy use → International and strategic level

This is rough and specialized information that is needed for policy issues within the UN, within regional entities such as the EU, and that is needed for national policy developments. The needed data should underlie assessments of different aspects of societies – thus environmental and demography input data for these assessments together with needed reference data.

III.1.b. Geospatial data for planning and management → National and management level

In order to obtain a sustainable society and reach the sustainable development goals, there is also a need for data with medium level of detail. Users here are commonly planning different activities at regional and national levels, also based on relevant reference data. All sectors will participate with separate actions to obtain sustainable development – thus needs within all sectors have to be covered.



III.1.c. Geospatial data for local level action → Local and action level

Planned actions have to be implemented and carried out. These can be for example rescue operations, flood mitigation, pollution clean-up actions, sustainable farming and forestry operations, safe sea transport operations etc. Very detailed data and sector specific data are commonly needed, but also a basis of reference information.

III.2. The temporal dimension

Many core datasets may be seen as reference data which generally changes only slowly. Other elements that may qualify as ‘core’ are much more volatile. These include physical data such as meteorological and tidal information where the temporal element is central, but can also be important short-term changes in non-physical phenomena including socioeconomic and demographic data. Even something as basic as population, while stable over a period of months, features a diurnal variation that is important in the context of economic sustainability and access to facilities. We need to consider the temporal resolution of core datasets in the same way as we need to consider the spatial resolution. Should time be measured in minutes, days, or years? Clearly it depends on the data and the use to which it is to be put. It is also worth considering how feature lifecycle management within location data itself can provide a temporal aspect on which to model changes over time, and provide valuable insight. For analytical purposes, then, it will be important to include data maintenance regimes within the scope of core data.

IV. Scoping of Core Data for “technological and natural hazard prediction” usages

IV.1. Introduction

WG A defined “technological and natural hazard prediction” usages by grouping the uses pertaining to the following UN SDG targets (i.e. sub-goals):

- 1.5: reduce exposure and vulnerability to climate-related extreme events
- 3.9: reduce the number of deaths from pollution
- 6.3: improve water quality by minimising releases
- 11.5: reduce the number of deaths due to disasters
- 11.6: reduce the environmental impact of cities, esp. air quality and waste management
- 12.4: achieve environmental compliant management of waste and chemicals
- 14.1: reduce marine pollution
- 15.8: reduce the impact of invasive species

The subgroup 1 of WG A has drafted a first proposal scoping the minimum core data required by the above uses.

IV.2. General considerations and outcomes

IV.2.a. The importance of meteorological data, elevation and hydrography for hazard assessment

Short-term *weather forecasts* are key to prevent flood disasters. This natural hazard (entailing major natural risks over Europe) requires also *elevation data* as well as hydrography data. There is a consensus over the



importance of getting elevation data with 20 to 50 cm altimetry accuracy to provide relevant assessments, at least on flat areas prone to being flooded, plus a physical description of the coast line. In the same way, the location of *surface and ground water* is a key aspect. Therefore the “*physical waters*” package of INSPIRE data specifications on Hydrography should be taken into account. Other specific information on water flow is required for specific flood assessment, but as no generic assessment methods can be broadly considered as a standard, core data should only focus upon the “skeleton” that physical waters are.

IV.2.b. The European dimension of the issue of Core Data versus Thematic Data

European Union Directives applying to the scope of “technological and natural hazard prediction” are the legal framework for the EU Member States, and they bring a relevant reflection for the other European UN Member States. Several EU directives apply to this scope: Water Framework Directive 2000/60/EC, Waste Framework Directive 2008/98/EC, Nitrates Directive 91/676/EEC (Art. 3). An issue to be answered by subgroup 1 (and Work Group A in general) is whether reporting data specified in such specific EU Directives should be taken into account, or – as a first stage – only the data source of these specific data should be taken into account.

This issue has a major impact on the way to address the “*area management, restricted and regulated areas*” theme: should it be considered as core data (a pros argument for that being that it is backed by EU Directives), or should only source data (e.g. factories for Seveso Directive, waste discharge, pipelines for Waste Directive) be taken into account? The table below provides several examples:

EU Directive	Reporting data	Source data
Water Framework Directive (WFD) 2000/60/EC	INSPIRE Environmental Monitoring Facilities data themes : <ul style="list-style-type: none"> • Ecologic state • Chemical state 	Physical waters
EU Directive	Reporting data	Source data
Waste Directive 2008/98/EC	Specific information on type of waste, volume	<ul style="list-style-type: none"> • Waste discharges • Identification of pipelines and sources of waste
Seveso Directives	Regulated and restricted areas	<ul style="list-style-type: none"> • Physical description of the facility as a building • Identification of the Seveso facility as such
The Industrial Emissions Directive 2010/75/EU	No reporting data	<ul style="list-style-type: none"> • Physical description of the facility as a building • Identification of the Seveso facility as such

This issue may not arise for other cases, such as “*restricted areas at sea*”: the identification of the sea is useless as source data, and some restricted areas (particularly areas of jurisdiction) may be considered as core data for the “*administrative data*” point of view.



IV.2.c. Proposed boundary between core data and thematic data

WG A proposes core data for supporting sustainable development to be a mix of classical reference data and of particularly important thematic data. In this way, core data will include both underlying data (e.g. to be input to assessments) and also some important result data or end user data. These different kinds of data have different roles and will support different actions performed in different sectors in strategic work, planning and management, research and assessments.

Relevant data can be data based on political or administrative decisions – master maps, management zones if important in e.g. hazards operations. In hazards we also have to secure the availability of data on exposed elements – people, economic activities, and environment, cf. below.

As regards the “*area management, restricted and regulated areas*” INSPIRE theme, an argument to consider it as core data is that it is backed by EU Directives. Moreover, it can be argued that restricted areas should be included as there are definitely grounds why there are restrictions. Therefore, Work Group A proposes to integrate the most important areas in core data.

As regards environmental monitoring facilities, though they are keys in the warning chain, they are deemed as being out of scope of core data, as they can be hooked upon the “*physical waters*” package.

IV.2.d. The issue of exposed elements

The notion of element exposed to hazards should be included in core data, because they are essential to understand the consequences of different incidents and to extract overviews and statistics. However any feature of the real world could be considered as an exposed element, hence the issue for WG A is to determine which part of real world features should be selected to be included in core data.

The concept of “*exposed element*” is quite vague, and has not been dealt with. INSPIRE data specs on “*Natural Risk Zones*” provide a first draft (backed by the 2007/60/EC Directive on Floods):

- People, settlement and social perspective: *demography, transport network, cadastral parcels, buildings;*
- Environment and heritage perspective: *identification of cultural / natural landmarks, natural parks;*
- Economic perspective: *affected GDP, number of employment.*

The discussion within Subgroup 1 concluded that, in emergencies, information about endangered persons and infrastructure is crucial. Therefore carefully selected data (e.g. number of inhabitants and buildings within defined zones, transportation networks, and infrastructure facilities) should be taken into account.

IV.3. Draft list of core data and use levels for “technological and natural hazard prediction” usages

Core geospatial data have been selected as being of prime importance for following up the UN sustainability goals related to “technological and natural hazard prediction” usages. The table underneath presents the selected core data and the use levels at which they are suitable: international and strategic level; national and management level; local and action level.



Data group	Data theme	International and strategic level	National and management level	Local and action level
Topography	Elevation		x	x
	Orthophotos			x
	Hydrology - surface waters		x	x
Location	Geographical names	x	x	x
	Administrative units	x	x	x
	Addresses			x
	Cadastral parcels			x
Transport networks	Transport network		x	x
Land resources	Land cover	x	x	x
	Land use and land restrictions			x
Constructions and networks	Utilities, pipelines and water network			x
	Constructions for risk reduction			x
	Non-physical networks			x
Population and settlements	Buildings and settlement areas			x
	Demography	x	x	x
	Socio-economic indicators	x	x	x
Public services, production and human activities	Public services		x	x
	Production facilities		x	x
Environment	Environmental valuable areas/sites	x	x	x
	Precipitation		x	x
	Winds		x	x
	Storms		x	x

V. Scoping of Core Data for “availability of natural resources and maintenance of biodiversity” usages

V.1. Introduction

Work Group A defined “Availability of natural resources and maintenance of biodiversity” usages by grouping the uses pertaining to the following UN SDG targets (i.e. sub-goals):

- 2.1: end hunger
- 2.3: double the productivity and income of small-scale producers
- 2.4: ensure sustainable food production systems
- 6.1: universal access to drinking water
- 6.3: improve water quality by minimising releases
- 6.5: implement water resources management
- 6.6: protect and restore water-related ecosystems
- 8.4: improve resource efficiency to decouple economic growth from environmental degradation
- 8.9: promote sustainable tourism
- 11.4: safeguard world's cultural and natural heritage



- 11.a: ensure links between urban and rural areas
- 12.2: efficient use of natural resources
- 13.1: strengthen resilience to climate related hazards
- 14.2: protect coastal ecosystems
- 15.1: ensure conservation of inland freshwater ecosystems
- 15.2: promote sustainable management of forests
- 15.3: restore degraded land
- 15.4: ensure conservation of mountain ecosystems
- 15.5: reduce degradation of natural habitat
- 15.8: reduce the impact of invasive species
- 15.9: integrate biodiversity values into national and local planning

The subgroup 2 of Work Group A has drafted a first proposal scoping the minimum core data required by the above uses.

V.2. Use Cases

A number of use cases that can be connected to the above SDGs have been selected from INSPIRE:

Data specification name	Page	Use case
INSPIRE Data Specification on Hydrography	149 - 152	B.2.3
INSPIRE Data Specification on Transport Networks	200 - 203	B.1,B.3
INSPIRE Data Specification on Buildings	200 - 250	B.4
INSPIRE Data Specification on Addresses	96 - 131	B.2.1
INSPIRE Data Specification on Statistical Units	93 - 95	B.1
INSPIRE Data Specification on Land Cover	110 - 126	B.1
INSPIRE Data Specification on Land Use	125 - 144	B.3,B.4,B.6
INSPIRE Data Specification on Elevation	158 - 169	B.2
INSPIRE Data Specification on Cadastral Parcels	85 - 92	B.3,B.6
INSPIRE Data Specification on Administrative Units	111 - 113	B.4,B.5
INSPIRE Data Specification on Geology	147 - 172	B.2,B.7
INSPIRE Data Specification on Orthoimagery	105 - 113	Use case 5
INSPIRE Data Specification on Agricultural and Aquaculture Facilities	99 – 119	B.1
INSPIRE Data Specification on Utility and Government Services	153 - 166	B.1,B.2

V.3. European Directives

We have also looked through relevant European Union Directives connected to the scope of our SDGs:

V.3.a. Environment

- The Directive 76/464/EEC of 4 May 1976 on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community
- [Birds Directive](#) (Council Directive 2009/147/EC on the conservation of wild birds)



- [Environmental impact assessment](#) (Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment)
- Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control; replaced by Directive 2008/1/EC (see below)
- [Freedom of access to information Directive](#)
- [Integrated Pollution Prevention and Control](#) (Directive 2008/1/EC of the European Parliament and of the Council of 15 January 2008 concerning integrated pollution prevention and control)
- [Industrial Emissions Directive](#) 2010/75/EU
- [Habitats Directive](#) (Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora)
- Nitrates directive 91/676/EEC
- [Water Framework Directive](#) (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)
- [Urban Waste Water Directive](#) (Council Directive 91/271/EEC of 21 May 1991 concerning urban waste water collection and treatment)
- [Waste framework directive](#) (Directive 2008/98/EC of the European Parliament and of the Council on waste)
- [Floods directive](#)
- [Landfill Directive](#)
- [Strategic environmental assessment](#) (Directive 2001/42/EC)
- [Waste Electrical and Electronic Equipment Directive](#) ("WEEE directive")
- [Large Combustion Plant Directive](#) (Directive 2001/80/EC of 23 October 2001 on the limitation of emissions of certain pollutants into the air from large combustion plants)
- [Noise emission in the environment by equipment for use outdoors](#) (2000/14/EC – "OND")

V.3.b. Wildlife and nature conservation

- [Birds Directive](#) (2009/147/EC)
- [Habitats Directive](#) (Council Directive 92/43/EEC)
- [Marine Strategy Framework Directive](#) (Council Directive 2008/56/EC)
- World heritage convention (UNESCO convention on the identification of natural (and also cultural) places to be conserved)
- Ramsar convention (International treaty on the conservation of wetlands of international importance)

V.3.c. Other Directives (e.g. serving statistical data needs)

- [Airborne noise emitted by household appliances directive](#)
- [Appliances burning gaseous fuels directive](#)
- [Artificial optical radiation directive](#) (2006/25/EC in force from 5 April 2006)
- [Battery directive](#) (2006/66/EC in force from 6 September 2006)
- [Cableway installations designed to carry persons directive](#)
- Colours for use in foodstuffs (1994/36/EC 30 June 1994)
- Common agricultural policy
- [Construction Products Directive](#)
- [Dangerous Preparations Directive](#) (1999/45/EC in force from 30 July 2002)
- [Efficiency requirements for new hot-water boilers fired with liquid or gaseous fuels directive](#) ("Boilers directive")



- [Electromagnetic compatibility directive](#) ("EMC directive")
- [Energy efficiency requirements for ballasts for fluorescent lighting directive](#)
- [Energy efficiency requirements for household electric refrigerators, freezers and combinations thereof directive](#)
- [Equipment and protective systems intended for use in potentially explosive atmospheres](#) (94/9/EC "ATEX directive")
- [Explosives for civil uses directive](#)
- [Food supplements directive](#) (2002/46/EC 10 June 2002)
- [General product safety directive](#)
- [Interoperability of trans-European conventional rail system directive](#)
- [Interoperability of trans-European high-speed rail system directive](#)
- [Landfill Directive](#)
- [Lifts Directive](#)
- [Low voltage Directive](#)
- [Machinery directive](#)
- [Marine equipment directive](#)
- [Measuring instruments directive](#)
- [Minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres](#) (99/92/EC "ATEX directive")
- [Noise emission in the environment by equipment for use outdoors directive](#)
- [Non-automatic weighing instruments directive](#)
- [Packaging and packaging waste directive](#)
- [Personal protective equipment directive](#) ("PPE directive")
- [Pressure Equipment Directive](#)
- [Product liability directive](#)
- [Promotion of electricity produced from renewable energy sources](#) ("Renewables Directive")
- [Promotion of cogeneration based on a useful heat demand in the internal energy market](#) (2004/8/EC "CHP Directive")
- [Promotion of the use of biofuels and other renewable fuels for transport](#)
- [Radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity directive](#) (1999/5/EC "R&TTE Directive")
- [Recreational Craft Directive](#)
- [Registration, Evaluation and Authorisation of Chemicals](#) ("REACH directive")
- [Restriction of Hazardous Substances Directive \(RoHS\)](#) ("RoHS directive")
- [Restrictions on marketing and use of certain dangerous substances and preparations directive](#) ("Azocolourants directive")
- [Safety of toys directive](#)
- [Simple pressure vessel directive](#)
- [Tobacco Advertising Directive](#) (IP/02/1788)
- [Transportable pressure equipment directive](#)



V.4. General considerations and outcomes

The broad scope of sub-group 2 can be divided into three issues to be tackled. Each of them is dealt by European Union policies, some of which are described below with a particular focus upon the geospatial reporting data they infer and on the backing geospatial data required to produce the reporting data).

V.4.a. Sustainable water and food production

To support these SDG and European Directives, especially to monitor and forecast the needs in water and food production, supply and end-usages, we need to keep track of water location, water quality, elevation to predict water movement, risks for water quality in the surroundings. It includes provision of water, drinking water to the human population, and water for any other purpose: agriculture, facilities, human activities as well as sustainable provision of food.

EU Policy	Purpose	Reporting data	Source data
Common Agricultural Policy	Main policy to back European agriculture.	Farmers and growers must report the surface of : <ul style="list-style-type: none"> • The lands used for production; • The surface of the lands not used for agriculture. In the 3 rd version of the policy (for 2014 -2020), subsidies may depend on the surface and on the type of production as well as on the respect of environmental rules (diversity of usages, respect of permanent grasslands).	<ul style="list-style-type: none"> • Orthophotos • Digital elevation models
Water Framework Directive 2000/60/EC	Identifying and monitoring the quality of water areas in Europe	<ul style="list-style-type: none"> • River basins • Hydrography: surface water and underground water • Chemical and ecological state of surface waters • Chemical state of underground waters 	<ul style="list-style-type: none"> • Digital elevation model • Aerial imagery • Geological data
Nitrates Directive 91/676/EEC	Identification of nitrate polluted waters and pollution mitigation	<ul style="list-style-type: none"> • Polluted waters • Vulnerable waters • Nitrate ratio 	<ul style="list-style-type: none"> • Hydrography network, including water caption areas

V.4.b. Management of biodiversity

The broad issue is first to assess the biodiversity available as well as its evolution over time. What are the core data to be reported at local, regional and international level upon which thematic data may be hooked? Management of biodiversity may include not only the location and monitoring of hotspots, but also a description and the management of the green and blue corridors over the European territory, which are assessed as key for the maintenance of biodiversity. What are the types of land cover that are especially to



be monitored in this scope (such as wetlands or permanent grasslands)? What should be the accurate pace of update of the core data to be provided in this respect? How should the monitoring of marine and underwater biodiversity be backed by core data?

EU policy	Purpose	Reporting data	Source data
Habitats Directive 92/43/EEC	Long-term survival and conservation of natural habitats, including the setup of a list of protected sites (Natura2000 sites)	<ul style="list-style-type: none"> Protected sites 	<ul style="list-style-type: none"> Orthoimagery Bio-geographical regions Species distribution
Birds Directive 2009/147/EC	Setup of special protection areas (included in Natura 2000 sites)	<ul style="list-style-type: none"> Protected sites 	<ul style="list-style-type: none"> Orthoimagery
World Heritage Convention	UNESCO convention on the identification of natural (and also cultural) places to be conserved	<ul style="list-style-type: none"> Protected sites 	<ul style="list-style-type: none"> Orthoimagery
Ramsar Convention	International treaty on the conservation of wetlands of international importance	<ul style="list-style-type: none"> Protected wetlands 	<ul style="list-style-type: none"> Hydrography Orthoimagery

V.4.c. Environmental impact of human activities

The human footprint is a major threat to the biodiversity. It may be assessed in several ways e.g. the emission of greenhouse gases and the evolution of soil-sealing. How could core data contribute efficiently to this assessment?

The human impact can besides be monitored with:

- The assessment of the potential technological hazards and pollutions. This aspect is addressed by sub-group 1.
- The analysis of the evolution of land use, as well as soil artificialisation (and therefore land-cover).

This monitoring is integrated within the framework of the directives and international conventions previously mentioned about biodiversity, as they deal not only with location and identification of biodiversity, but also with its protection (therefore including the mitigation of the impact of human activities on them).

The International Coastal Zone Management is also an instrument to deal with biodiversity protection (and sustainable development to a larger extent) of coastal zone management, which includes:

- Pollution control (addressed by sub-group 1)
- Habitat management
- Environmental impact assessment
- Coastal land planning (land planning may also be addressed by sub-group 3)



V.5. Draft list of core data for “availability of natural resources and maintenance of biodiversity” usages

Data group	INSPIRE Data theme	Definition
Geometric base or framework	Coordinate reference systems	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. [Directive 2007/2/EC]
	Geographical grid systems	Harmonised multi-resolution grid with a common point of origin and standardised location and size of grid cells. [Directive 2007/2/EC]
	Geographical names	Names of areas, regions, localities, cities, suburbs, towns or settlements, or any geographical or topographical feature of public or historical interest. [Directive 2007/2/EC]
	Administrative Units	Units of administration, dividing areas where Member States have and/or exercise jurisdictional rights, for local, regional and national governance, separated by administrative boundaries.
	Transport networks	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 No 1692/96/EC.
	Elevation	Digital elevation models for land, ice and ocean surface. Includes terrestrial elevation, bathymetry and shoreline. [Directive 2007/2/EC].
	Buildings	Geographical location of buildings [Directive 2007/2/EC].
	Protected sites	Area designated or managed within a framework of international, Community and Member States' legislation to achieve specific conservation objectives [Directive 2007/2/EC].
	Land Cover	Physical and biological cover of the earth's surface including artificial surfaces, agricultural areas, forests, (semi-)natural areas, wetlands, water bodies [Directive 2007/2/EC]
	Orthoimagery	Geo-referenced image data of the earth's surface, from either satellite or airborne sensors [Directive 2007/2/EC]
	Hydrography	Hydrographic 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. * OJ L 327,22.12.2000, p.1. Directive as amended by Decision No. 2455/2001/EC (OJ L 331, 15.12.2001, p.1.). [Directive 2007/2/EC]
Addresses	Location of properties based on address identifiers, usually by road name, house number, postal code [Directive 2007/2/EC].	
Other themes	Statistical units	Units for dissemination or use of statistical information. [Directive 2007/2/EC]
	Environmental monitoring Facilities	Location and operation of environmental monitoring facilities includes observation and measurement of emissions, of the state of environmental media and of other ecosystem parameters (biodiversity, ecological conditions of vegetation, etc.) by or on behalf of public authorities [Directive 2007/2/EC].



Natural risk zones	Vulnerable areas characterised according to natural hazards (all atmospheric, hydrologic, seismic, volcanic and wildfire phenomena that, because of their location, severity, and frequency, have the potential to seriously affect society) e.g. floods, landslides and subsidence, avalanches, forest fires, earthquakes, volcanic eruptions. [Directive 2007/2/EC]
Area management/restriction/regulation zones and reporting units	Areas managed, regulated or used for reporting at international, European, national, regional and local levels. Includes dumping sites, restricted areas around drinking water sources, nitrate-vulnerable zones, regulated fairways at sea or large inland waters, areas for the dumping of waste, noise restriction zones, prospecting and mining permit areas, river basin districts, relevant reporting units and coastal zone management areas. [Directive 2007/2/EC]
Geology	Geology characterised according to composition and structure. Includes bedrock, aquifers and geomorphology [Directive 2007/2/EC]
Population distribution-demography	Geographical distribution of people, including population characteristics and activity levels, aggregated by grid, region, administrative unit or other analytical unit [Directive 2007/2/EC].
Land Use	Territory characterised according to its current and future planned functional dimension or socio-economic purpose (e.g. residential, industrial, commercial, agricultural, forestry, recreational). [Directive 2007/2/EC]
Oceanographic geographical features	Physical conditions of oceans (currents, salinity, wave heights, etc.)." [Directive 2007/2/EC]
Bio-geographical regions	Areas of relatively homogeneous ecological conditions with common characteristics. [Directive 2007/2/EC]
Sea regions	Physical conditions of seas and saline water bodies divided into regions and sub-regions with common characteristics. [Directive 2007/2/EC]
Habitats and biotopes	Geographical areas characterised by specific ecological conditions, processes, structure, and (life support) functions that physically support the organisms that live there. Includes terrestrial, fresh water and marine areas distinguished by geographical, abiotic and biotic features, whether entirely natural or semi-natural. [Directive 2007/2/EC].
Species distribution	Geographical distribution of occurrence of animal and plant species aggregated by grid, region, administrative unit or other analytical unit.
Production and industrial facilities	This theme comprises features related to production and industry, as well as entities related to describing summary information about the activities taking place in production and industrial facilities, and the main environmental issues related to them (pollution prevention, waste management, risk). [Directive 2007/2/EC]
Population distribution	Geographical distribution of people, including population characteristics and activity levels, aggregated by grid, region, administrative unit or other analytical unit [Directive 2007/2/EC].



	Agricultural and aquaculture facilities	(INSPIRE, 2007) Farming equipment and production facilities (including irrigation systems, greenhouses and stables). [Directive 2007/2/EC]
	Utility and governmental services	Includes utility facilities such as sewage, waste management, energy supply and water supply, administrative and social governmental services such as public administrations, civil protection sites, schools and hospitals.” [Directive 2007/2/EC]
	Atmospheric conditions and Meteorological geographical features	- Theme III-13, Atmospheric conditions: Physical conditions in the atmosphere. Includes spatial data based on measurements, on models or on a combination thereof and includes measurements locations. [Directive 2007/2/EC] - Theme III-14, Meteorological geographical features: Weather conditions and their measurements: precipitation, temperature, evapotranspiration, wind speed and direction. [Directive 2007/2/EC]

VI. Scoping of Core Data for “sustainable economy and facilities” usages

VI.1. Introduction

WG A defined “sustainable economy and facilities” usages by grouping the uses pertaining to the following UN SDG targets (i.e. sub-goals) under three broad headings:

Access to facilities –

- 1.4: access to basic services, ownership and control over land
- 6.1: universal access to drinking water
- 7.1 universal access to energy services
- 9.1 develop sustainable and resilient infrastructure
- 9.c access to ICT and internet
- 11.1 ensure access to affordable housing and basic services, upgrade slums
- 11.2 provide access to sustainable transport systems for all
- 11.7 universal access to green spaces
- 11.a ensure links between urban and rural areas

Efficiency and growth –

- 6.4 increase water-use efficiency
- 6.5 implement water resources management
- 7.3 double the rate of energy efficiency
- 8.1 sustain economic growth
- 8.4 improve resource efficiency to decouple economic growth from environmental degradation



Sustainability –

- 6.5 implement water resources management
- 8.1 sustain economic growth
- 8.4 improve resource efficiency to decouple economic growth from environmental degradation
- 9.1 develop sustainable and resilient infrastructure
- 11.3 enhance inclusive and sustainable urbanisation
- 11.4 safeguard world’s cultural and natural heritage
- 11.5 reduce the number of deaths from disasters
- 11.a ensure links between urban and rural areas
- 13.1 strengthen resilience to climate related hazards

Subgroup 3 of WG A has outlined an initial proposal for the minimum core data themes required for these purposes. This will continue to be refined in consultation with the other subgroups of WG A.

VI.2. General considerations and outcomes

VI.2.a. Integration of statistical and geographical data

The need to monitor and analyse the relationships between human populations and their environment to ensure a sustainable economy and facilities has led Subgroup 3 to pay particular attention to the need to integrate statistical and geographical data sources. The statistical data required encompasses both demographic and economic statistics. Work done by Eurostat’s task force on the integration of statistical and geospatial information has emphasized that integration means more than just the combination of final information products (geospatial and statistical); the benefits of integration should be investigated and exploited during all stages of the statistical production process. A consequence of this is that geocoding of statistical and administrative data at unit record level is the most important condition for statistical-geospatial information integration, which in turn implies that local level data will be required for effective integration.

VI.2.b. Authoritative data

Core data is a subset of ‘authoritative data’; i.e. that which governments manage and which users can trust as being authentic. Authoritative data often fulfils the role of a reference, to which thematic data can be linked to derive other information and/or provide the means to communicate to policy makers, as well as to provide non-spatial data a geographical reference. Particularly important authoritative data sets are those that describe non-physical entities such as addresses, administrative units and cadastral parcels, so the role of government in defining and disseminating these is crucial to the concept of core data.

VI.3. Draft list of core data and use levels for “sustainable economy and facilities” usages

It is not possible to consistently measure and monitor sustainable development without location, people and temporal data. The Sustainable Development Goals will depend on human and physical geography data and geospatial information to measure and monitor change and progress.



There is so much commonality for detailed core data requirements amongst the “sustainable economy and facilities” sub-goals, that it is perhaps more useful to provide a framework on which common data groups and themes can be hung.

At the highest level, the common fundamental themes and requirements can be placed into three broad data groups:

1. LOCATION – everything that describes “place” and space.
2. PEOPLE – this is about human geography and is very much about measuring outcomes, statistically.
3. TEMPORAL – “time” is the key ingredient of understanding when and how people and place interact.

However, these three data groups are too broad in scope to enable or support a common definition for core data, at any meaningful or detailed requirements level. It is therefore necessary to subdivide these into fundamental data themes, which are themselves separate entities within each data group, but share some commonality within the data group – be it location, people or temporal. It is these fundamental data themes that provide the framework on which detailed core data requirements – for example buildings and land parcels data – can be placed.

This we feel also makes for fundamental data themes which are easier to:

1. Meet the criteria and guidelines around complete coverage over the area of interest, are needed consistently, have sufficient detail;
2. Communicate to a diverse range of users and sectors, and ultimately derive more significant benefit from their use;
3. Start to define the resolution at which core data should be captured.

We believe that this as a concept is a good skeleton on which to start hanging more detailed core data requirements. These themes are also more in line with the nine core reference geographies of INSPIRE.

To a large extent these fundamental data themes are appropriate to be captured at local level/high-scale data: (i.e. for analysis), which can be used to derive other levels of data through a generalisation process. This supports the vision of **capture once use many times**.



Rather than specify each detailed core data requirement within each of these categories, we have listed some examples that would be required at the different resolutions/scales of data.

Data Group		Theme	Local Level	Medium	Strategic
GEODETTIC FRAMEWORK	LOCATION (mapping & physical geography)	Imagery	X		
		Elevation & Depth	X		
		Land Cover	X (for example, buildings etc)		
		Physical Networks	X (for example, transport networks & services, utilities etc)		
		Non-physical networks	X (for example, internet & network coverage etc)		
		Addressing, Names and Places	X (for example, addressing, production facilities, greensapce etc)		
		Non-physical Boundaries	X (for example, cadastre/land parcels)	X (for example, administrative units, species distribution & regional habitats)	X (for example ecological Boundaries (SSSI's, AONB's))
		Geology, Environment & Resources	X (for example, mineral resources, energy facilities and resources, access to water etc)		
	PEOPLE (statistics & human geography)	Human Settlement	X (for example, buildings energy efficiency ratings & water usage etc)		
		Demographic	X (for example, population density, literacy rates, ethnicity etc)		
		Socioeconomic	X (for example, employment & living costs data, education & employment etc)	X (for example, land use etc)	X (for example, GDP)
	TEMPORAL	Meteorological/Weather	X (for example, droughts, winds, storms, extreme weather etc)	X	
		Tidal	X (e.g. storm surges etc)	X	



VII. Description of core data selected for sustainable development usages

Below are overall descriptions of selected core data, their characteristics and their relevance to major usages 1 (technological and natural hazard prediction), 2 (availability of natural resources and maintenance of biodiversity) and 3 (sustainable economy and facilities).

Data group	Data theme	Description
Topography	Elevation and coastline	<p>Required by major usages 1, 2 and 3.</p> <p>Continuous description of the altimetry. Elevation is key to assess several hazards (floods, avalanches, pollutant propagation) and is important information for land use. Coastline as a topographical description of the mean sea level is the ground for marine submersion analysis.</p> <p>The Integrated Coastal Zone Management (ICZM) policy is an EU integrated strategy for coastal zone management. Key areas of action for ICZM are environmental impact assessment, coastal land planning, habitat management and pollution control. Elevation is required to produce orthoimagery, upon which analysis on the land cover might be useful to assess evolutions of biodiversity on mountain areas.</p>
	Orthoimagery	<p>Required by major usages 1 and 2.</p> <p>Orthoimages are used to plot main topographical assets and are used as a main background layer in any map system. They also provide a good description of the environment (as a background) for hazard and risk management and for displaying natural resources. Moreover, they are used by farmers and growers of the EU to declare their agricultural and non-agricultural areas on a yearly basis within the framework of the Common Agricultural Policy.</p>
	Hydrology, surface waters and sea regions	<p>Required by major usages 1 and 2.</p> <p>Locations of surface waters and river networks are key to understand water flows and assets, to predict different kind of floods and to describe water quality and water pollution. Theme should include data on water tables to predict water table overflows. The Water Framework Directive provides a set of rules in order to maintain or restore the quality of EU waters.</p>
Location	Geographical names	<p>Required by major usages 1 and 2.</p> <p>Geographical names are the main assets used to locate all kinds of public and private services. Place names are used in rescue operations and at low-scale level.</p>
	Administrative units	<p>Required by major usages 1 and 2.</p> <p>Along with geographical names, administrative units are used for global location at low-scale level. Data on counties and municipalities should be reflected, as well as data on territorial boundaries and areas at sea.</p>
	Addresses	<p>Required by major usages 1 and 3.</p> <p>At high scale level, which is required for crisis management, addresses are the main georeferenced asset used to locate people in case of a crisis.</p>
	Cadastral parcels	<p>Required by major usages 1 and 3.</p> <p>Cadastral parcels are areas defined by cadastral registers. The cadastral plan is the main asset used for local land-use planning, as it provides the link between an area and its ownership.</p>



Transport networks	Transport networks	<p>Required by major usages 1 and 2.</p> <p>The location of transport networks and their semantic description (such as the number of ways) are of major importance to plan transportations and organise the rescue operations in case of a crisis. Their overlap with hazards areas give an assessment of their availability for the rescue chain.</p>
Land resources	Land cover	<p>Required by major usages 1 and 2.</p> <p>Land cover data may be used to display different resources and predict hazards and risks. The degree of soil sealing can for example help predict the evolution of a flood flow over time.</p> <p>Land cover is also a key aspect for the assessment of human footprint. The update of land cover data should be adapted according to its location: barren areas as well as city centres might require a slower pace of update than peri-urban areas, as the latter type is likely to evolve faster than the two former types. Moreover, some types of land cover are likely to have a bigger role in the evolution of biodiversity (e.g. permanent grasslands, ponds and wetlands) and might be more accurately (temporally and spatially) described.</p>
	Land use and land restrictions	<p>Required by major usages 1 and 2.</p> <p>Regional plans and master plans for areas, alongside with data on sector specific land rights and land restrictions data. Land use gives information about how different areas are used or planned to be used. Protective sites and restricted areas around contaminated sites, or air quality management zones, are to be known by the public in order to lower their exposure to the involved hazards.</p> <p>Many of the management and planning activities at local level require detailed data. Proper location is important. The detailed area planning covers both land and coastal areas.</p> <p>Land use is important for assessing the impact and monitoring the implementation of policies and legal instruments for sustainable management of the environment, like Natura 2000.</p>
	Mineral resources	<p>Required by major usages 1 and 3.</p> <p>Assessing the importance and the location of mineral resources is essential to drive economic growth over a given area.</p>
Constructions and networks	Utilities, pipelines and water network	<p>Required by major usages 1 and 2.</p> <p>Utilities and pipelines are important infrastructures in society. Data on networks and utility installations are used for efficient sector management, for land use planning and for environmental management. Utility constructions and e.g. waste water networks can leak and engender pollution. Pieces of information regarding the type of hazardous substances being conducted are also important. Particular attention should be paid to the utilities and pipelines involved by the Seveso Directives (that aim at preventing and mitigating technological risks in the EU).</p>
	Constructions for risk reduction	<p>Required by major usage 1.</p> <p>These are constructions reducing effects of major hazards. Examples are location of dikes that surround a water course and sea areas, land slide walls and other constructions to be taken into account for hazard prediction as well as local elevation.</p>
	Non-physical networks	<p>Required by major usages 1 and 3.</p>



		Internet and telecommunication network coverages represent an important asset for land use planning to help economic growth.
Population and settlements	Buildings and settlement areas	Required by major usages 1 and 2. The location of buildings may give an overview of human settlements and human activities. Buildings represent economic values and cultural heritage. Building location data are to be used in assessing risk and in rescue operations.
Population and settlements (cont.)	Demography	Required by major usages 1 and 2. Spatial data on population are important to understand societal developments, urbanisation, transport needs, use of and impact on natural resources, sustainable economic growth, employment etc. These data are also important to be used in assessment of humans exposed to a hazard, being the most important asset to assess a risk. Therefore, the location and assessment of the number of people living (including the location of temporal housings, such as camping sites in touristic places), and working in a hazard areas is of major importance.
	Socio-economic indicators	Required by major usages 1 and 3. Socio-economic indicators such as employment rate, education rate and living cost data are key indicators of social and economic development.
Public services, production and human activities	Public services	Required by major usages 1 and 2. All population are to use different kinds of public services. Data on public services are locations of services such as hospitals and medical treatment, schools, governmental and municipal offices, day-nurseries, retirement and nursing homes etc. These data are important to inform people about services. Any building open to the public may be endangered if it is located in a hazard area. Locating them, knowing their function and how many people they can host is a key aspect for risk assessment. In case of a crisis, pinpointing where the governmental services are is important to organise the rescue chain. In risk management, their presence in a hazard area (such as floods) will give an indication of their availability in case of a crisis.
	Production facilities	Required by major usages 1 and 2. Production facilities, industry locations, waste disposal and treatment sites are important activities to hold in a location database. These activities reflect human activity and affect maintenance of biodiversity and natural resources. They can also be considered as “sources” of technological hazards, hence their location, as well as the type of risk involved (such as e.g. explosion, boil-over) are to be known. In this respect, particular attention should be paid to the facilities involved by the Seveso Directives. Needed in modelling and assessment of pressures on the environment, in land use planning, in risk and hazards management. Needed for information to the public.
Environment	Environmental valuable areas or sites, protected sites	Required by major usages 1 and 2. This includes important areas in environmental management and land use planning, as well as areas containing natural exposed elements. Crisis management requires being aware of environmental stakes (such as important natural resources) and especially of possible ecological losses such as protected sites. Protected sites identified either in the



		<p>“Habitats” Directive, or by international conventions (Ramsar, World heritage sites).</p>
	Bio-geographical regions	<p>Required by major usage 2.</p> <p>These data are used for comparisons and assessments of biodiversity and conservation, at international, national and even regional levels. These data are used with high detail level in land management and local land use planning. The European bio-geographical regions are used for validating Natura 2000 national proposals.</p> <p>Knowledge about the extent of local and regional bio-geographical regions, e.g. in the form of vegetation maps, may be used to identify climatic, topographic or geological characteristics, as there is a correlation between certain species and such factors.</p>
Environment (cont.)	Meteorological geographical features, atmospheric conditions	<p>Required by major usages 1 and 2.</p> <p>An assessment of the intensity, the localisation and the time of occurrence of precipitations is of major importance to predict floods. A description of the intensity, the localisation and the period of occurrence of winds is as well of major importance to predict marine submersions and avalanches. Winds are also important to predict the flow of air pollutants.</p> <p>A description of the intensity, the localisation and the period of occurrence of strong storms is mandatory to predict this type of natural hazards.</p>
	Habitats and biotopes	<p>Required by major usage 2.</p> <p>These data enable to assess changes in landscape and effects on wildlife and plant life. A selection of valuable habitats has been designated according to the ‘Habitats’ and ‘Birds’ EU Directives. In the marine environment a selection of valuable habitats has also been designated according to the ‘OSPAR’ and ‘HELCOM’ conventions.</p> <p>These data are documented and used for identifying biotic diversity within areas or countries, in terms of geographical distribution, variety and representation frequency. They are used for planning protection and management of biodiversity in natural, semi-natural and artificial environments.</p>
	Species distribution	<p>Study of species distribution may be used for two aspects. First of all, the study of species as members of biodiversity. Therefore a full coverage of up-to-date species distribution data at Pan-European scale, for a major set of mammals, birds, and reptiles, vascular plants may be required. Second, species distribution may be used as indicators of the evolution of the ecological and chemical state of the biotope they live in, and therefore as indicators of environmental quality of air, inland waters, marine environment, soil, habitats. For example, abundance of fishes might be an indicator of a good chemical and ecological state of a river).</p> <p>These data can be used for conservation and statistical analysis, as a base of research in ecology and biodiversity, applied to the conservation and management of nature. In biodiversity assessment it is essential to have information on species distribution, quantities, development through time. It is especially needed for managing Natura 2000 areas. These data are documented in sciences and used for identifying biotic diversity within biotic regions or countries, in terms of geographical distribution, changes over time, combination of species in communities</p>



		and co-variance with environmental factors and ecological qualities. They are used for planning protection and management of biodiversity in natural, semi-natural and artificial environments.
--	--	---

VIII. Proposed next stages and areas for improvement

Consolidating user requirements and the core data list will have to be carried out by WG A before preparing the next task to be carried out i.e. drafting core data specifications.

Consolidating user requirements will require better taking into account all the stages of sustainable development policies and the data they require, not only the stage consisting in analysing sustainable development issues, but also the stages consisting in treating or mitigating sustainable development issues, and the stages consisting in making decisions and monitoring them. This will require WG A to interview sustainable development experts.

To get the best result, the previous approach will be combined with the approach consisting in examining past efforts to define core data, studying each SDG target and assessing which of the presumed core data themes are relevant.

Consolidating the core data list will require a WG A plenary workshop to select the data themes to retain. In this respect it is proposed to carry out an intersection of the data themes required by different SDG, rather than bringing together all the data themes required by all SDG. Indeed, the latter would entail a too broad and ambitious core data scope, while the former would entail a 'framework' or 'skeleton' with realistic feasibility. In other words, the use cases that will be common to several SDG targets will reveal good theme candidates for core data.