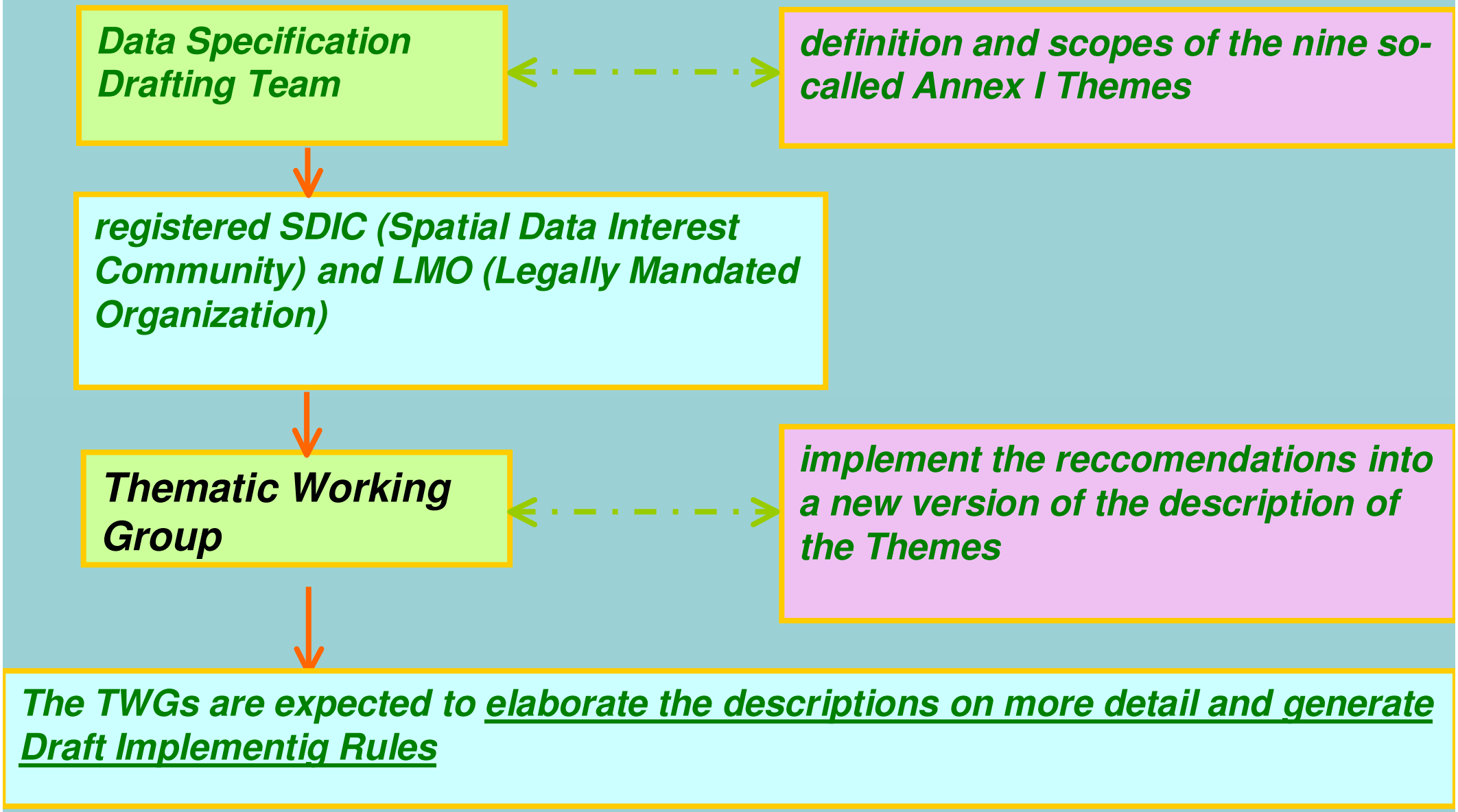
INSPIRE

INfrastructure for SPatial InfoRmation in Europe

- ***Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing INSPIRE was published in the official Journal on the 25th April 2007***

- ***The INSPIRE Directive entered into force on the 15th May 2007 (http://inspire.jrc.it/directive/l_10820070425en00010014.pdf)***


Data Specification Drafting Team
definition and scopes of the nine so-called Annex I Themes
registered SDIC (Spatial Data Interest Community) and LMO (Legally Mandated Organization)
Thematic Working Group
implement the reccomendations into a new version of the description of the Themes
The TWGs are expected to elaborate the descriptions on more detail and generate Draft Implementig Rules

ANNEX I
SPATIAL DATA THEMES…

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

2. Geographical grid systems
Harmonised multi-resolution grid with a common point of origin and standardised location and size of grid cells.

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

Implementing Rules CRS

For the horizontal component, INSPIRE will mandate for the areas within the geographical scope of ETRS89 the use of the European Terrestrial Reference System 1989 (ETRS89).

The International Terrestrial Reference System (ITRS) or other geodetic coordinate reference systems compliant with ITRS shall be used in areas that are outside the geographical scope of ETRS89.

The European continental and neighbour territories of the MS constitute the geographical scope of the ETRS89

Implementing Rules CRS

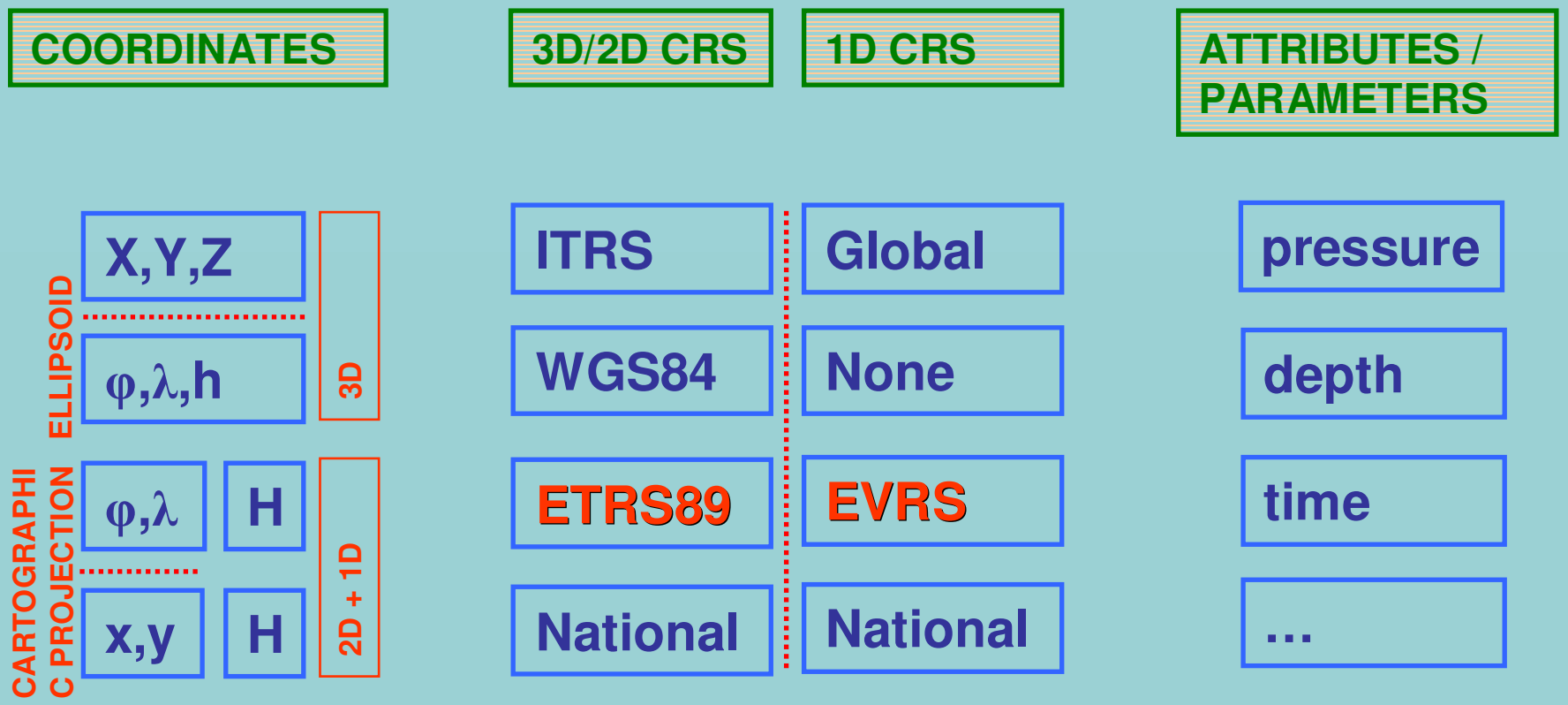
For the vertical component, INSPIRE will mandate for the areas within the geographical scope of EVRS the use of the European Vertical Reference System (EVRS).

Other vertical reference systems related to the Earth gravity field shall be used to express gravity-related heights in areas that are outside the geographical scope of EVRS.

The European continental territories of the MS constitute the geographical scope of the EVRS.

Coordinate Reference Systems Concept

GEO-SPATIAL DATA SETS



D2.8.I.1 INSPIRE Specification on Coordinate Reference Systems – Guidelines V3.1

INSPIRE does not require collection of new data. However, after the period specified in the Directive1 Member States have to make their data available according to the Implementing Rules.

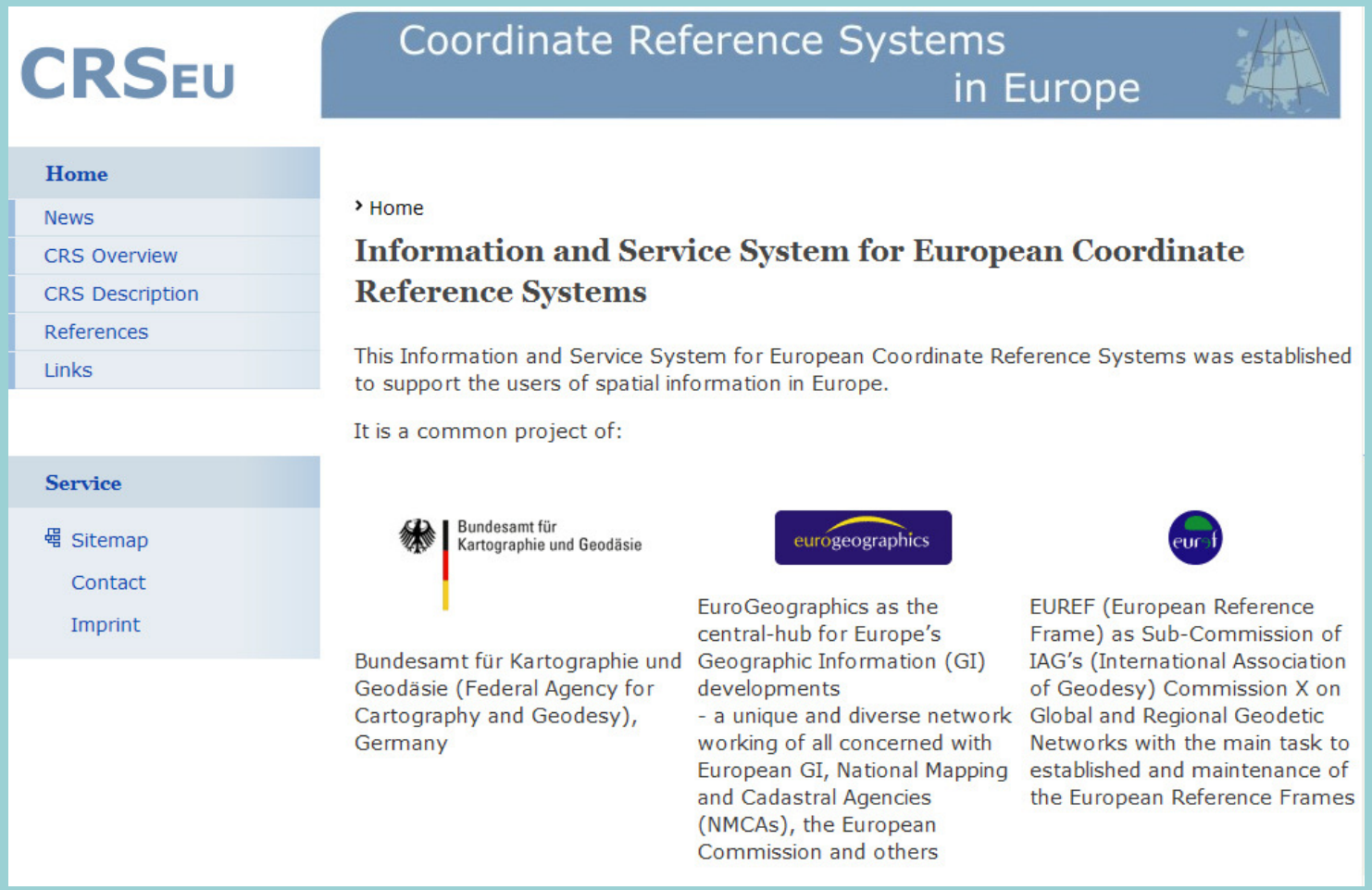
Coordinate reference systems (CRS) play a specific role that is quite different from the other themes in the Directive's annexes. Contrary to the other themes the CRS specification does not concern a downloadable or viewable thematic data set.

Rather, it presents a basic functionality allowing the harmonised and interoperable geographic localisation of spatial objects defined by the other INSPIRE thematic data specifications.

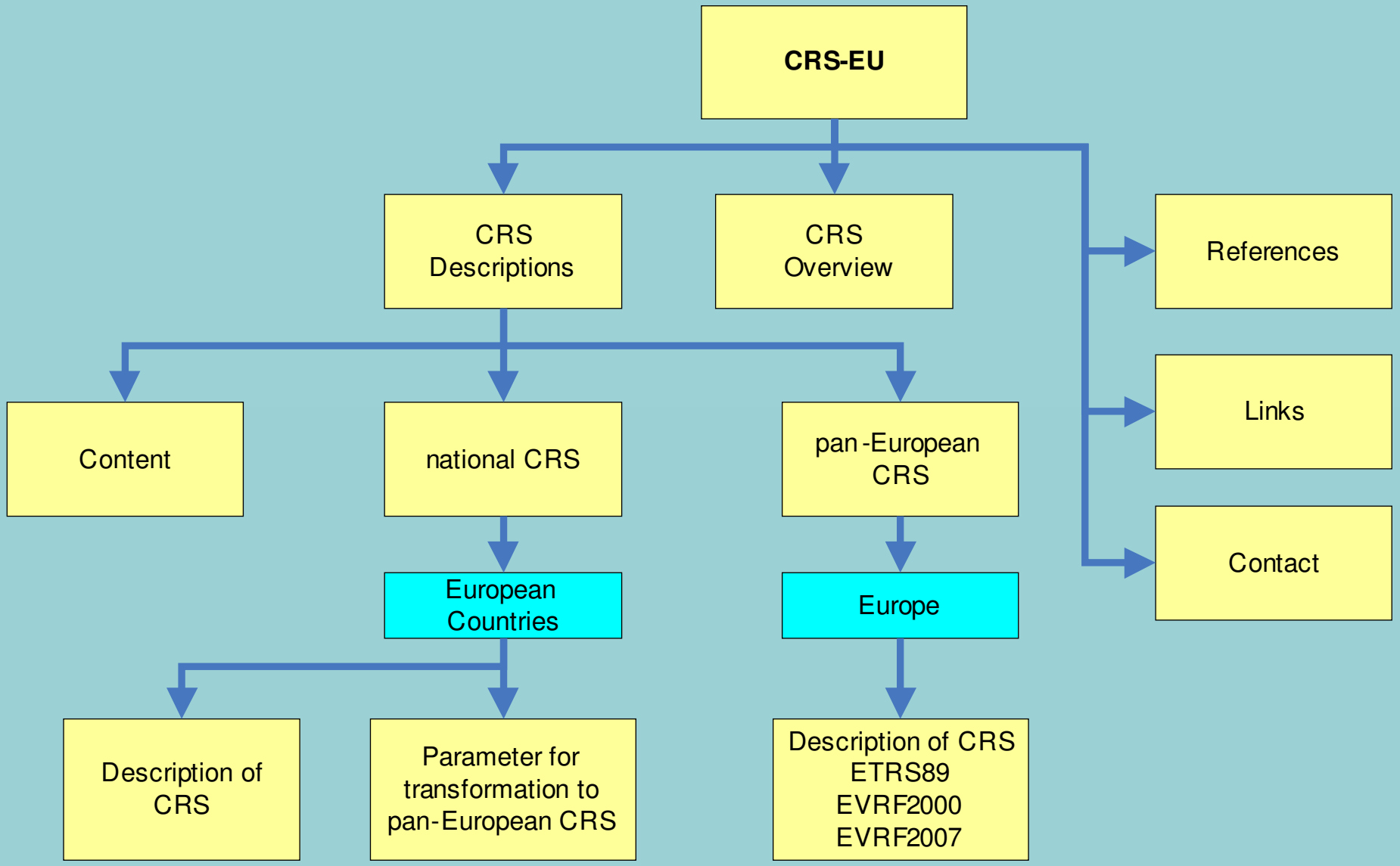
Therefore, the methodology developed by the Drafting Team Data Specifications is only partly applicable to the work of this Thematic Working Group.

CRS-EU

- Informationssystem for European Coordinate Reference Systems



CRS-EU Structure



INSPIRE

- ***Data Specifications (version 2) for themes of Annexes II and III were published for comments from LMO and SDIC (EUREF is a SDIC)***
- ***The deadline for comments was 21 October 2011***
- ***A check was made (by Torres) wrt Coordinate Reference Systems (CRS) to the content of the 3 themes marked in the next slide***

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

Annex II

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

Annex III

1. Statistical units
2. Buildings
3. Soil
4. Land use
5. Human health and safety
6. Utility and Government services
7. Environmental monitoring facilities
8. Production and industrial facilities
9. Agricultural and aquaculture facilities
10. Population distribution – demography
11. Area management / restriction / regulation zones & reporting units
12. Natural risk zones
13. Atmospheric conditions
14. Meteorological geographical features
15. Oceanographic geographical features
16. Sea regions
17. Bio-geographical regions
18. Habitats and biotopes
19. Species distribution
20. Energy resources
21. Mineral resources

RESULT OF CHECK

- ***All the documents have a common text related to the CRS***
- ***The text is based (almost copy-paste) on the already adopted Implementing Rules for the CRS***
- ***It's OK!***

- **the infrastructures for spatial information in the Member States should be designed to ensure that spatial data are stored, made available and maintained at the most appropriate level**

- **it is possible to combine spatial data from different sources across the Community in a consistent way and share them between several users and applications**

- **it is possible for spatial data collected at one level of public authority to be shared between all the different levels of public authorities**

- **spatial data are made available under conditions that do not restrict their extensive use**

- **it is easy to discover available spatial data, to evaluate their fitness for purpose and to know the conditions applicable to their use**

ANNEX I
…SPATIAL DATA THEMES

7. Transport networks
Road, rail, air and water transport networks and related infrastructure. Includes links between different networks.

8. Hydrography
Hydrographic elements, including marine areas and all other water bodies and items related to them, including river basins and sub-basins.

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

ANNEX I

…SPATIAL DATA THEMES…

4. 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.

5. Addresses

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

6. Cadastral parcels

Areas defined by cadastral registers or equivalent.

There are themes that may require other types of projections to fulfil their requirements.

Specific themes may use special projections internally.

In this case, these projections must be well documented to allow the conversion to geographic coordinates.

The documentation shall be provided according to ISO 19111, which states how a projected coordinate reference system must be described.

Implementing Rules CRS

The mandated CRS is used for any kind of information/resolution/accuracy; the resolution and accuracy of data are out of scope of the theme CRS.

The accuracy of the data sets resulting from transformations and conversion formulas are out of scope of the theme CRS.

The accuracy of the data sets must be documented by the data set provider according to all the aspects that contribute to it, namely the original accuracy and the accuracy of the conversions, transformations and handling of data.

There are themes for which data are expressed in linear systems for the horizontal component or on non-length-based vertical systems like pressure, density, for the vertical component.
This kind of referencing is parametric.

There are also themes that may require temporal references.

The referencing by parameters and temporal reference systems are out of scope of the theme CRS because the parametric systems do not provide unique and unambiguous referencing in space.

The parameters shall be associated with the specific data according to ISO 19111 (Part 2: Extension for parametric values).

Implementing Rules CRS

INSPIRE will mandate the Lambert Azimuthal Equal Area (ETRS89-LAEA) for pan-European spatial analysis and reporting where true area representation is required

INSPIRE will mandate the Lambert Conformal Conic (ETRS89-LCC) for conformal pan-European mapping at scales smaller than or equal to 1:500,000

INSPIRE will mandate the Transverse Mercator (ETRS89-TMzn) for conformal pan-European mapping at scales larger than 1:500,000

It is recommended that these projections be available in INSPIRE transformation services

Implementing Rules CRS

Identifier	Type of coordinates
ETRS89-XYZ	Cartesian coordinates in ETRS89 in space (X,Y,Z)
ETRS89-GRS80h	Geodetic (geographic) coordinates and ellipsoidal height in ETRS89 on the GRS80 ellipsoid (Latitude, Longitude, Ellipsoidal height)
ETRS89-GRS80	Geodetic (geographic) coordinates in ETRS89 on the GRS80 (Latitude, Longitude)
EVRS	Height in EVRS (H)
LAT	Depth of the sea floor, where there is an appreciable tidal range (D)
MSL	Depth of the sea floor, in marine areas without an appreciable tidal range, in open oceans and effectively in waters that are deeper than 200m (D)
ISA	Pressure coordinate in the free atmosphere (P)
PFO	Pressure coordinate in the free ocean (P)
ETRS89-LAEA	ETRS89 coordinates projected into plane coordinates by the Lambert Azimuthal Equal Area projection (Y,X)
ETRS89-LCC	ETRS89 coordinates projected into plane coordinates by the Lambert Conformal Conic projection (N,E)
ETRS89-TMzn	ETRS89 coordinates projected into plane coordinates by the Transverse Mercator projection (N,E)

Implementing Rules GGS

INSPIRE will mandate the Grid_ETRS89-LAEA for pan-European spatial analysis or reporting where true area representation is required. The grid is based on the ETRS89 Lambert Azimuthal Equal Area coordinate reference system with the centre of the projection at the point 52° N, 10° E and false northing: Y0 = 3210000 m, false easting: X0 = 4321000 m.

Reference point of grid cell for grids based on ETRS89-LAEA is the lower left corner of the grid cell.

Implementing Rules GGS

- *The grid is defined as hierarchical one in metric coordinates in power of 10.*
- *The resolution of the grid is 1m, 10m, 100m, 1000m, 10,000m, 100,000m.*
- *The grid orientation is south-north, west-east.*
- *Reference point of a grid cell for grids based on ETRS89-LAEA is the lower left corner of the grid cell.*
- *Cell code is composed of the size of cell and the coordinates of the lower left cell corner in ETRS89-LAEA*

(*follows the recommendations from the European Environmental Agency)*

Implementing Rules GGS

Inspire geographical grid systems form a geo-referencing framework for the themes where grids with fixed and unambiguously defined location of grid cells are needed. Mandating or recommending the use of these grid systems for individual Inspire themes or concrete cross themes applications is out of scope of this Inspire theme.

When discrete values referred to one grid (e.g. sampling results) are converted to a different grid, there is no possibility to maintain the original thematic information.

Controlling and recording resampling steps provides the needed input for calculation of expected errors.

Implementing Rules GGS

Inspire geographical grids themselves, with no values assigned to individual cells, are implemented and exchanged as vector data (lines or polygons).

Thematic datasets based on geographical grids are exchanged as tables, lists or as gridded data.

Conclusion

- Deadline for the version 3 of the document: 26 June 2009!
- Terminology "conversion table" needed between the IAG and CRS worlds; EUREF TWG must be involved in the IAG related initiatives (RESOLUTION)
- The NMA have a fundamental role in helping the other communities to understand the requirements
- The NMA representatives in EUREF are a fundamental piece in the INSPIRE implementation process (RESOLUTION)

CRS-EU

- common project of EUREF / BKG / EuroGeographics
- address www.crs-geo.eu
- information
  - were provided from the National Mapping Agencies (NMA)
  - or prepared / compiled by BKG and agreed with NMA
  - always unified and prepared regarding ISO-Standard 19111