

Guide for EEA map layout

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Version 4

European Environment Agency



Version management and approval

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4	06-06-2011	General revision of the EEA GISguide ver. 3. The content has been divided into two documents: <ul style="list-style-type: none">• ‘Guide for EEA GIS data and map production’• ‘Guide for EEA map layout’	Carsten Iversen
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Project manager: Hermann Peifer

Foreword

The aim of this guideline is to provide guidance making maps using the EEA templates and background GIS data.

The target audience are the EEA in-house GIS operators making and finalizing maps for EEA reports or for the web. The secondary audience are the external expert delivering maps and data to EEA using the EEA templates and background GIS data. Templates and data are available for Esri-applications only.

Any comments and questions can be forwarded using the web interface at <http://www.eea.europa.eu/help/infocentre/enquiries>.

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1. Map extents used by the EEA

The EEA has developed a set of defined map extents to cover all ‘standard’ needs. The map extents are used in all EEA publications and information material and all extents are predefined in templates for ArcGIS. Templates and data can be downloaded from here:

<http://www.eea.europa.eu/data-and-maps/data/eea-mapdata-and-templates-gis-4> (Login is required).

The EEA handles geographic data from many institutions and sources, and presents them as maps in different publications and on the Web. Map data and template files are tailored for the specific purpose of getting harmonised outputs that fit the general EEA standard layout of reports.

There are several benefits by the defined map extents:

- Harmonious appearances of maps;
- Map production are easier and more effective;
- Map sizes fit report layout standards;
- It is easy to mix and reuse data from different productions;
- The map extents covers some 70-80% of the total needs for standard maps in reports;

1.1. Coverage of map extents

The map extent series are defined according to **east–west** coverage:

- Map Extent 1 EU-27 + EFTA
- Map Extent 2 EU-27 + EFTA + three candidate countries (CC-3), *EEA coverage*
- Map Extent 3 Europe + Caspian and Aral Seas (ENP* East)
- Map Extent 4 Europe + Caspian and Aral Seas + Canary Islands
- Map Extent 5 Europe + Caspian and Aral Seas + North Atlantic + North Pole
- Map Extent 6 Europe + Russia + Central Asia, narrow
- Map Extent 7 Europe + Russia + Central Asia, wide
- Map Extent 8 World
- Map Extent 9a Countries of the Mediterranean Sea region (ENP* South)
- Map Extent 9b Mediterranean and Black Seas
- Map Extent 10 Europe + Central Asia + Russia (partly)

More information of countries and groupings at the following links:

European members and candidate countries: http://europa.eu/abc/european_countries/index_en.htm

EU external relations: http://ec.europa.eu/external_relations/regions/index_en.htm

*) ENP = European neighbourhood policy (http://ec.europa.eu/external_relations/enp/index_en.htm)

Some templates may have up to five different versions, depending on **north–south** extent and different islands inserted (see Figure 1.1):

- core
- core + north extension
- core + south extension
- core + north and south extensions
- core + inserted Islands

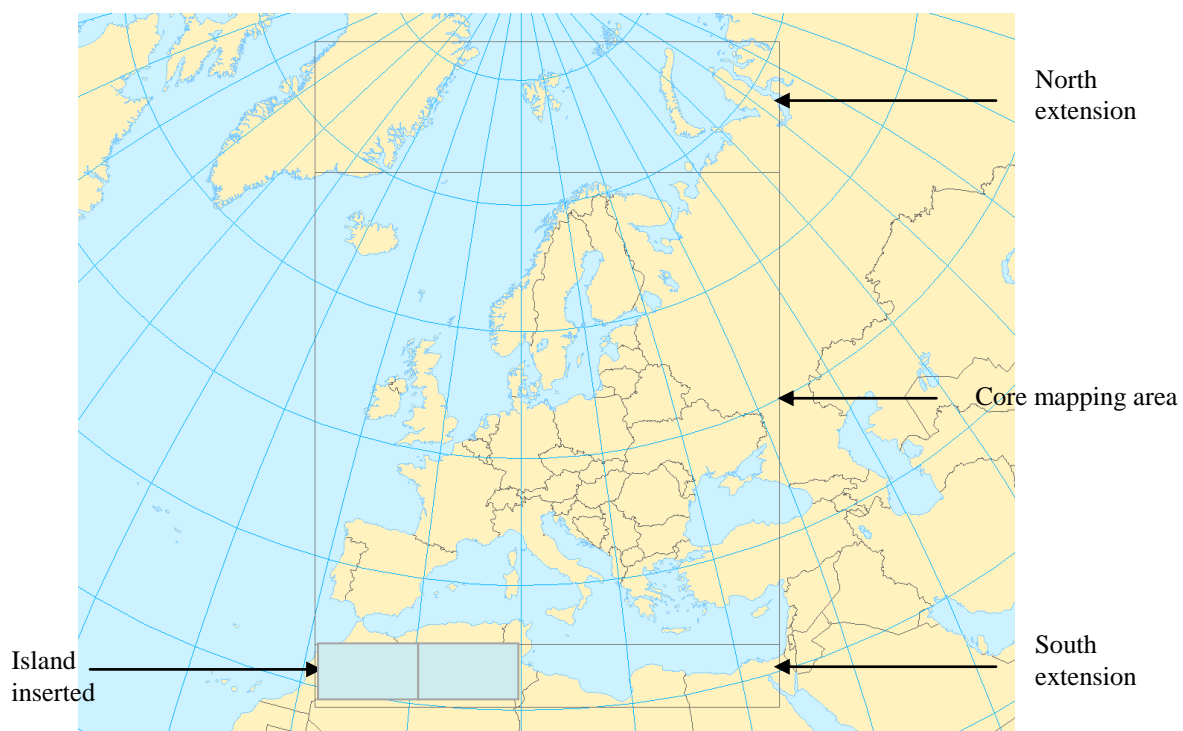


Figure 1.1: Example of map inserted, extent and its possible extensions to the north and south. The map number refers to an extent in east–west direction.

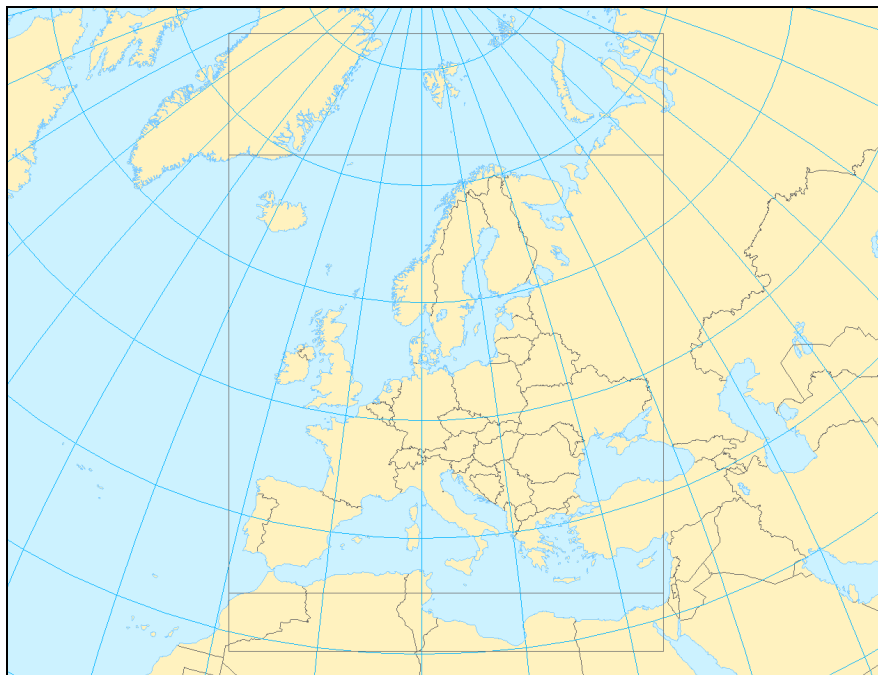
1.2. Illustrations of EEA Map extent series

The following pages present the series of agreed map extents. Legends and scale bar are not shown in the examples. All map extents are prepared with the legend placed to the right outside the map and with a map scale placed in the lower left corner inside the map.

Map Extent 1:

EU-27 + EFTA

- Map_1c
- Map_1c_insert
- Map_1c_n
- Map_1c_ns
- Map_1c_s



Map Extent 2:

EU-27 + EFTA + CC-3 (*EEA coverage*)

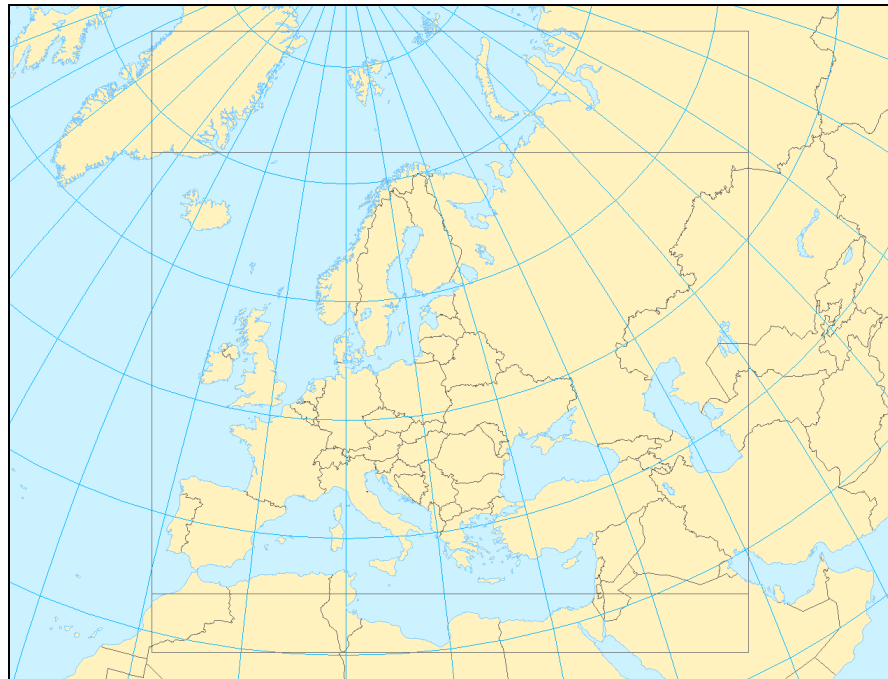
- Map_2c
- Map_2c_insert
- Map_2c_n
- Map_2c_ns
- Map_2c_s



Map Extent 3:

**Europe + Caspian
and Aral Seas (ENP
East)**

- Map_3c
- Map_3c_n
- Map_3c_ns
- Map_3c_s



Map Extent 4:

**Europe + Caspian
and Aral Seas +
Canary Islands**

- Map_4c
- Map_4c_n



Map Extent 5:

**Europe + Caspian
and Aral Seas +
North Atlantic +
North Pole**

- Map_5c



Map Extent 6:

**Europe + Russia +
Central Asia,
narrow**

- Map_6c



Map Extent 7:

**Europe + Russia +
Central Asia, wide**

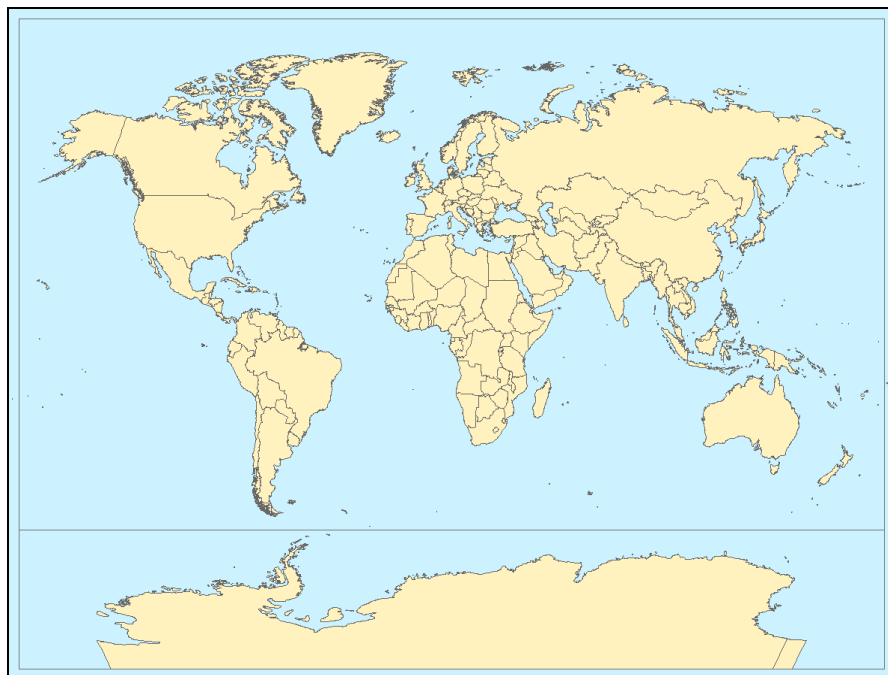
- Map_7c



Map Extent 8:

World

- Map_8c
- Map_8c_s



Map Extent 9a:

**Countries of the
Mediterranean Sea
region (ENP South)**

- Map_9a



Map Extent 9b:

**Mediterranean +
Black Seas**

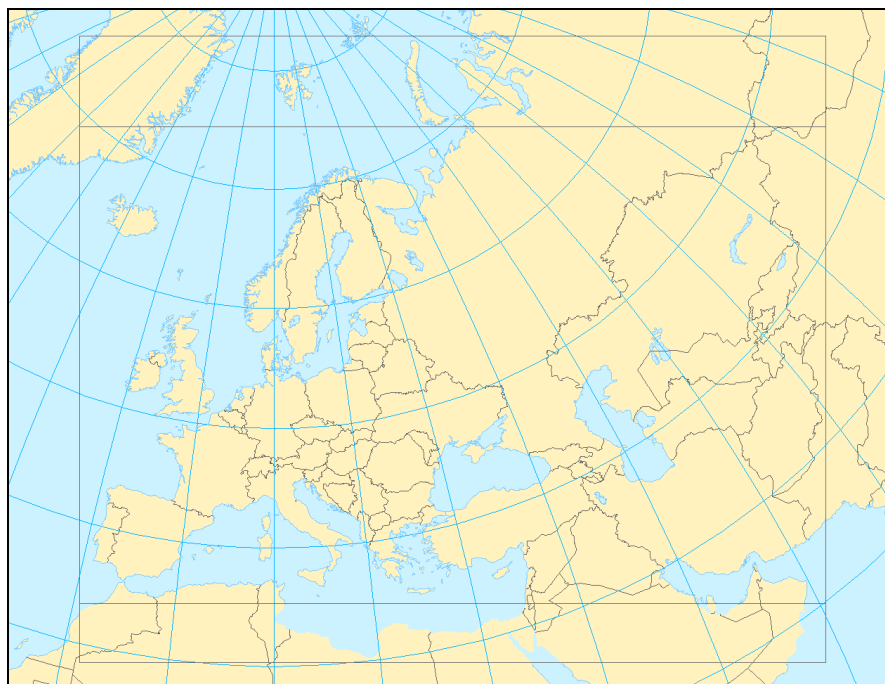
- Map_9b



Map Extent 10:

**Europe + Central
Asia + Russia
(partly)**

- Map_10c
- Map_10c_n
- Map_10_ns
- Map_10_s



1.3. Specification of map extents by coordinates

All values given in coordinates related to the projection specified.

Map extent	EPSG-code / projection	Bottom	Left	Top	Right
Map 1c	EPSG: 3035	1 350 000	2 555 000	5 500 000	6 580 000
Map 1c insert	EPSG: 3035	750 000	2 555 000	5 500 000	6 580 000
Canary Is.		770 000	1 400 000	1 300 000	2 120 000
Açores Is.		2 150 000	780 000	2 800 000	1 500 000
Madeira Is.		1 380 000	1 640 000	1 650 000	2 030 000
Map 1 c+s	EPSG: 3035	800 000	2 555 000	5 500 000	6 580 000
Map 1 c+n	EPSG: 3035	1 350 000	2 555 000	6 650 000	6 580 000
Map 1 c+ns	EPSG: 3035	800 000	2 555 000	6 650 000	6 580 000
Map 2 c	EPSG: 3035	1 350 000	2 555 000	5 500 000	7 405 000
Map 2 c insert	EPSG: 3035	650 000	2 555 000	5 500 000	7 405 000
Canary Is.		770 000	1 400 000	1 300 000	2 120 000
Açores Is.		2 150 000	780 000	2 800 000	1 500 000
Madeira Is.		1 380 000	1 640 000	1 650 000	2 030 000
Map 2 c+s	EPSG: 3035	800 000	2 555 000	5 500 000	7 405 000
Map 2 c+n	EPSG: 3035	1 350 000	2 555 000	6 650 000	7 405 000
Map 2 c+ns	EPSG: 3035	800 000	2 555 000	6 650 000	7 405 000
Map 3 c	EPSG: 3035	1 350 000	2 555 000	5 500 000	8 100 000
Map 3 c+s	EPSG: 3035	800 000	2 555 000	5 500 000	8 100 000
Map 3 c+n	EPSG: 3035	1 350 000	2 555 000	6 650 000	8 100 000
Map 3 c+ns	EPSG: 3035	800 000	2 555 000	6 650 000	8 100 000
Map 4 c	EPSG: 3035	800 000	1 400 000	5 500 000	8 100 000
Map 4 c+n	EPSG: 3035	800 000	1 400 000	6 650 000	8 100 000
Map 5	EPSG: 3035	800 000	-100 000	7 450 000	8 100 000
Map 6	EPSG: 3035	800 000	1 500 000	10 450 000	9 900 000
Map 7	LAEA-52N-65E	1 275 000	2 800 000	8 650 000	13 350 000
Map 8 c	Times10E	- 6 200 000	- 14 500 000	10 850 000	14 500 000
Map 8 c+s	Times10E	- 10 850 000	- 14 500 000	10 850 000	14 500 000
Map 9a	EPSG: 3035	- 402 000	1 789 000	3 200 000	7 350 000
Map 9b	EPSG: 3035	479 000	2 460 000	3 200 000	6 950 000
Map 10 c	EPSG: 3035	1 350 000	2 555 000	5 800 000	9 450 000
Map 10 c+s	EPSG: 3035	800 000	2 555 000	5 800 000	9 450 000
Map 10 c+n	EPSG: 3035	1 350 000	2 555 000	6 650 000	9 450 000
Map 10 c+ns	EPSG: 3035	800 000	2 555 000	6 650 000	9 450 000

- Lambert Azimuthal Equal Area (LAEA), datum ETRS89, 52 N, 10 E, false easting: 4 321 000, false northing: 3 210 000, EPSG code: 3035.
- Lambert Azimuthal Equal Area (LAEA), datum ETRS89, 52 N, 65 E, false easting: 8 446 000, false northing: 3 210 000, EPSG code non existent.
- Customized Esri Times CRS using Times_world 10 E for centralizing Europe. (Geographic CRS: GCS_WGS_1984). The EPSG-code is non-existent.

Read more about the EPSG-codes in the “Data guide for EEA map production” chapter 1.1.4.

2. EEA layout

EEA developed a set of specifications for maps and legends. This chapter focuses on maps produced for reports. Much of the information is also relevant for maps produced for the Web. The EEA and ETCs are expected to use the specifications frequently unless there is a specific reason for not doing so. Maps are published as standalone products in [EEA CMS for Maps and Graphs](#) and can then be used in several different EEA products in addition to the report, indicator or webpage for which they were originally produced.

2.1. A4-standard size for maps

The EEA has a standard A4-page layout for printed reports. Each page is divided into two columns of 82.4 mm and between the columns there is a 5 mm space. The columns can be subdivided into two 38.7 mm columns with 5 mm space. Maps produced for reports as well as for factsheets should as far as possible follow these sizes.

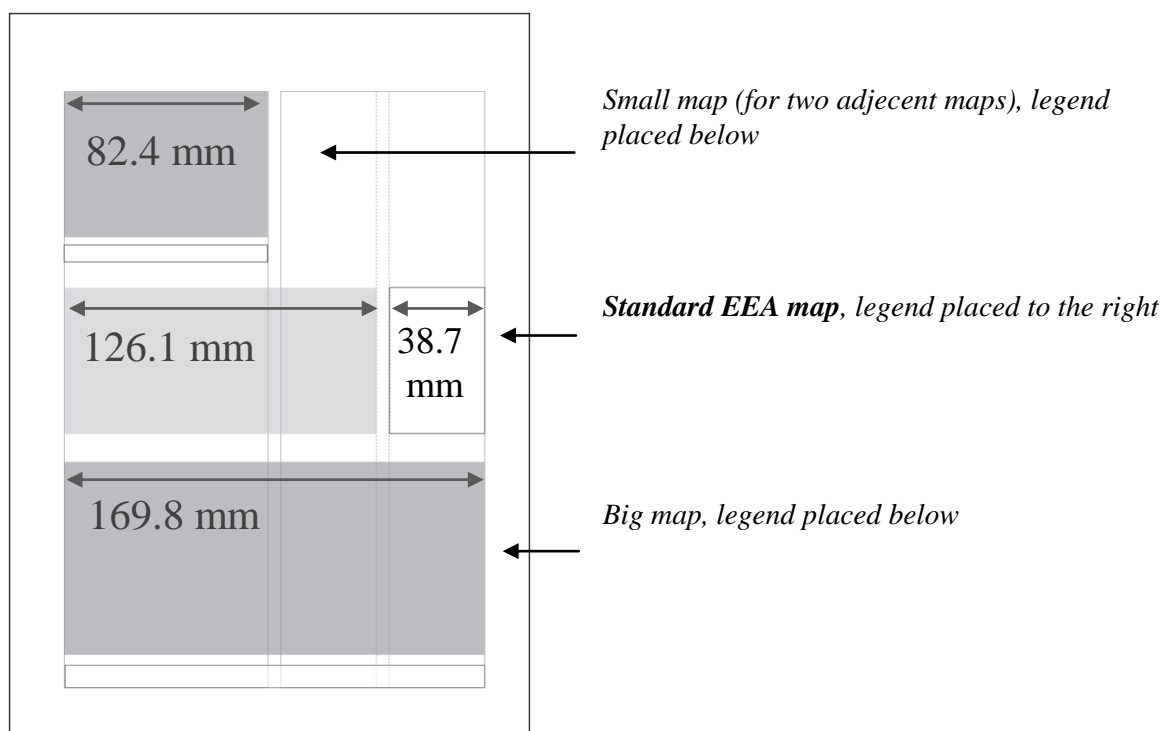


Figure 2.1: Dummy A4-page with the EEA layout standard.

- **The standard EEA map has a width of 126.1 mm, the legend at the right hand side has a width of 38.7 mm and there is a 5 mm space between map and legend.**
- Accepted widths are:
 - 82.4 mm, where two small maps are presented side by side, legend is placed below
 - 126.1 mm, **standard**, legend (38.7 mm) is placed to the right of the map
 - 169.8 mm, legend is placed below the map, same width as the map
- In a few cases, maps covering two pages are used. Contact OSE Publications for sizes.

The examples below show a ‘small map’, a ‘Standard EEA map’ and a ‘big map’ following the specified sizes.

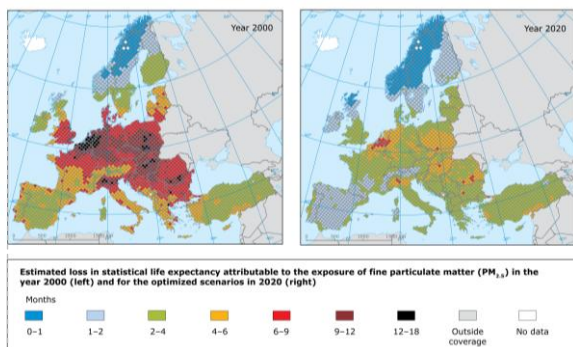


Figure 2.2: Two ‘small maps’ placed side by side and the legend placed below. The width of each map is 82.4 mm corresponding to the width of one column in EEA reports.

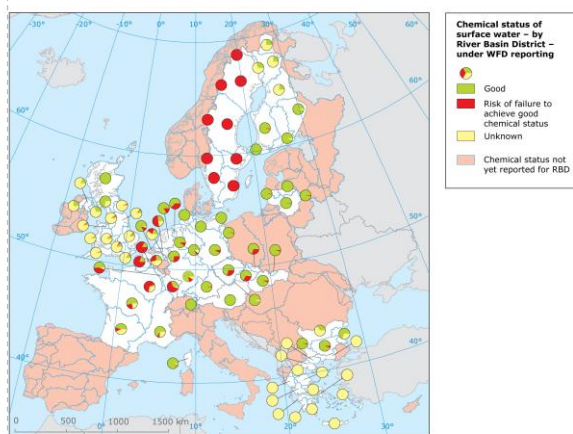


Figure 2.3: The EEA standard map measuring 126.1 mm and the legend placed to the right outside the map. The legend measures 38.7 mm with 5 mm space between the map and the legend.

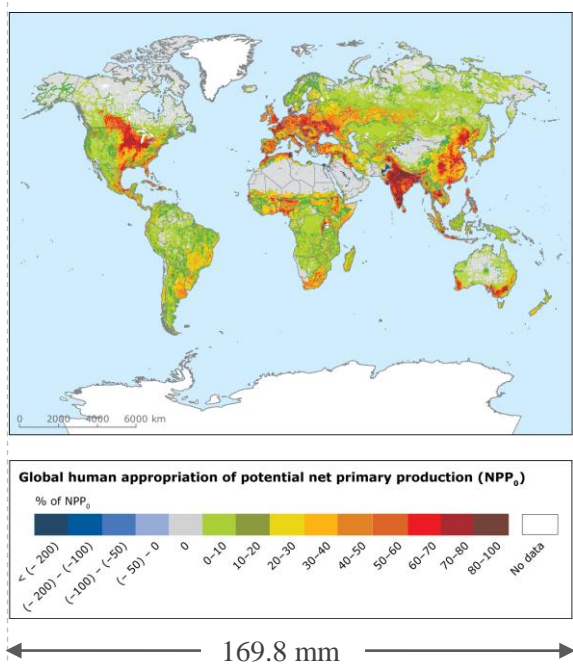


Figure 2.4: The ‘big map’ measuring 169.8 mm and the legend placed below the map.

2.2. Size for maps produced for A5-format

With the development of tablets an increasing number of reports will be written in A5 format for optimal utilization of space. Maps produced for A5-format reports should as far as possible follow these sizes. Each page is held in one column in width 109.00 mm. The legend is placed 4.0 mm below the map.

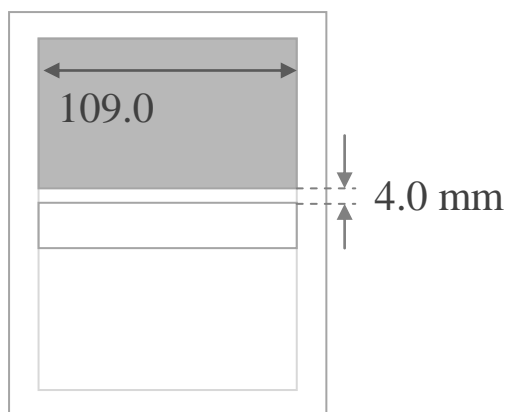


Figure 2.5: Dummy A5-page with the EEA map layout.

2.3. Scales of maps

The EEA does not focus on certain scales for the maps presented in reports. The scaling of maps in order to provide one of the standard layout widths will probably not result in a rounded map scale. The EEA finds this of low importance for small-scale maps. The focus is on the size of the maps in the output product. Follow the standard for map width in reports.

2.4. Level of generalisation

Different generalisation of elements, e.g. administrative units, rivers and coastlines are available from the EEA:

- EEA GIS data (core data) are environmental data stored for staff usage, and are not selected for mapping purposes. The data are primarily for producing environmental indicators;
- For most of the basic features, the GISCO reference database (<http://www.urbandata.org/>) is delivered in three or four different levels of generalisation (scale 1, 3, 10 and 20 mill.). If a dataset is available at different scales, the data with the smallest scale should be used for mapping;
- Some datasets have a fixed generalisation. Datasets with polygons cut along the coast with a certain coastline will remain with this coastline;
- The EEA compiled a selection of generalised GIS datasets adapted to make maps at small scales. ETCs and others producing maps on behalf of the EEA should use this selection. The data are labelled EEA map data. EEA's ArcGIS map templates are also based on the use of these GIS data. The data are available from <http://www.eea.europa.eu/data-and-maps/data/eea-mapdata-and-templates-gis-4> (Login is required).

2.5. Standard elements/features in maps

The maps produced by the EEA for printed reports are usually very simplified. Accordingly, the maps delivered to the EEA should contain few elements in the small-scale maps:

- Few general elements/background features;
- Few topic issues per map – usually one issue is enough. Maps covering more than one issue usually appear overloaded and the message in the map is lost.

The features delivered from the EEA to be used in map production are based on a level of generalisation comparable to 1:20 000 000 or even smaller. Below is a table of proposed features for small scale maps covering Europe.

EEA map data	Filename	Size – width 82.4 mm	Size – width 126.1–169.8 mm
Countries polygon	countries	x	x
Sea surface	sea	x	x
Lake, large	lakelarge	x	x
Lake, medium	lakemedium		x
Lake, small	lakesmall		
River, major (Eurasia)	river		x
River, large	riverlarge		x
River, medium	rivermedium		x
Country boundaries, terrestrial	countryborder	x	x
Arctic circle and tropics	parallels		x
Lat/long every 10°	latlong10	x	x
Coastline	coastline	x	x

The above table gives a generalised picture of the databases delivered from the EEA that could be used in the different map sizes. A mark is only an indication of the features that should be included in the map.

2.6. Standard layer orders

The layers of the map as they come from the GIS system should be reflected as layers in the postscript file. Text should be placed in separate layers, according to the feature they are naming. If all standard layers are in use, the following layer order is recommended.

Feature/map element	Layer order
Frame	1
Text	
Thematic text	2
Country names	3
Towns	4
Seas/lakes/ivers	5
Grid numbers	6
Points	
Thematic point data	7
Cities	8
Lines	
Thematic boundaries/line data	9
Coast/sea shoreline	10

Roads	11
Rail	12
Country boundaries	13
Rivers, medium	14
Rivers, large	15
Lake/shoreline	16
Gridnet (lat/long)	17
Polygons/areas	
Lake/river surface	18
Outside data coverage areas	19
Sea surface	20
Thematic areas	21
Countries	22
Land surface	23

2.7. Colour and graphics definitions

The EEA defined graphic layout (colour/line size) for selected features frequently used on maps. The specifications below fit the needs for use as originals in reports, factsheets and – in most cases – the Web.

Colour and graphics for background layers

The EEA distinguishes between polygon/area features, line features, point features and text.

Feature/map element	CMYK code	Colour	Size/pt	Font/line type/ fill type
Polygons/areas				
Land surface	2-0-20-2	Yellow		Fill/no line
Land surface – missing values/no data (*)	0-0-0-0	White		Fill/no line
Land surface – outside data coverage (*)	0-0-0-15	Grey		Fill/no line
Sea surface	17-0-0-0	Blue		Fill/no line
Lake/river surface	17-0-0-0	Blue		Fill/no line
Lines				
Coast/sea shoreline	50-10-0-0	Blue	0.3	Line
Rivers	50-10-0-0	Blue	0.3	Line
Lake/shoreline	50-10-0-0	Blue	0.3	Line
Country boundaries	0-0-0-60	Grey	0.4	Line
Thematic boundaries	No line			No line
Frame	0-0-0-100	Black	0.5	Line
Gridnet (lat/long)	100-30-0-0	Blue	0.28	Line
Roads	0-100-100-0	Red	0.3	Line
Rail	0-0-0-80	Grey	0.3	Line
Points				
Capitals	0-100-100-0	Red	6 pt	
Cities	0-0-0-100	Black	4 pt	
Text (**)				
Country names	0-0-0-100	Black		Verdana (***)
Towns	0-0-0-100	Black		Verdana (***)
Seas/rivers/lakes	100-30-0-50	Blue		Verdana (***)
Grid numbers	100-30-0-0	Blue	5.25 pt	Verdana (***)

(*) 'No data'-colour is always white and 'Outside data coverage'-colour is always grey in EEA products.

(**) Note that the EEA advises following Eurostat's practice for maps: the use of geographical names (especially seas, oceans, etc.) should be avoided. However, country names (capitalised) and capital names should be in English while for rivers, cities etc the EEA follows Times Atlas for naming.

(***) For text on Web maps, the recommended fonts are Verdana, Tahoma, Geneva or Arial.

For ArcGIS users: The colours defined above are used in the template files produced by the EEA. When adding new layers/datasets to a production, use of the lyr files renders the predefined colours while use of the shp files does not.

Colour and graphics for thematic information – use of common colour scales

General rules of map semiology, such as using a maximum of seven different colours or a maximum of five densities of grey (*The Semiology of Graphics*, Bertin, 1983), should be respected. The EEA recommends:

- When using statistical or ordinal division of data, the EEA has recommended colour scales. Please see <http://www.eionet.europa.eu/gis/mapping.html> where files with the exact definitions of colours can be found (CMYK and RGB).
- When presenting colour distribution of areas (polygons), avoid using a separate colour for the outline/boundary of each area. Maps look cleaner without thematic boundary lines.

Colour systems – CMYK and RGB

The colours are given in:

- CMYK for printing purposes: e.g. 5-100-55-12 or 0-12-10. The K value (black shade) is commonly omitted when equal to zero;
- RGB for screen purposes: e.g. 102 47 153. RGB colours are sometimes given in hexadecimal code (often used in HTML), e.g. 66 2F 99 = 102 47 153.

The colours defined in the different systems may not be translated directly. CMYK has a limited colour spectrum compared with the other systems, especially in bright colours. If you have defined colours in RGB on the screen, the system may give you an incorrect colour as CMYK. This may also be the case when sending maps to a printer.

2.8. Legend

A map has a legend, see example in figure 2.6. The postscript file with the map should also contain the legend with the layout to be used in the report. The legend is placed outside the map frame, normally to the right, with a 5 mm space between map and legend.

The legend standards are as follows:

- **Width:** 38.7 mm is standard. See example to the right.
- **Fonts:** Font type is Verdana both in ordinary text and in

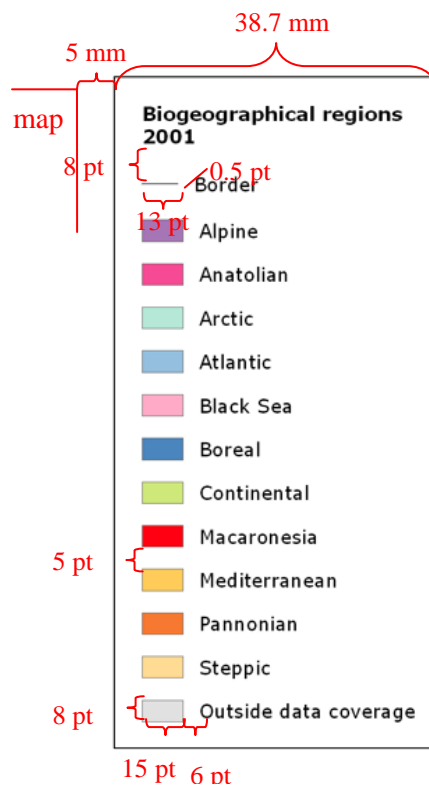


Figure 2.6: Legend specification

heading for printed material. For Web, recommended font types are Verdana, Tahoma, Geneva or Arial.

- **Font size:** All text is 7 pt, headings in bold, category text is normal. Text colour is 100 % black.
- **Spacing between legend elements:** In the example, the spacing between title and legend items is 8 pt. The spacing between label patches vertically is 5 pt.

Other:

- All text is left oriented;
- Where category text is longer than one line, the first line should be aligned with the label patch;
- Allow space between numbers and %: 7 %;
- Allow space between minus and numbers: – 7;
- Allow no space in year spans: 1900–2000;
- Interval dash is made using ALT+0150: –;

Text: translation implications

A number of the EEA reports are translated into the languages of the member countries. Text in maps and graphs are also translated and the text parts need to be easily accessible to the translation process. Therefore, the EEA makes the following recommendations:

- Place text in separate layers;
- Define text with the prescribed fonts and sizes;
- Do not outline text;
- Text that will be translated later should be black or grey (use only the K parameter in CMYK). Other text, such as numbers or ‘IDs’ on locations, could have other colours. Note that the EEA advises following Eurostat’s practice for maps, that the use of geographical names (especially seas, oceans, etc.) should be avoided.

Postscript export settings in ArcGIS

Postscript format (eps, pdf or ai) is required for high quality printing. The export of maps to postscript format is done from ArcGIS.

Resolution of the output is set in Options (figure 2.7):

- *Resolution* to ‘300 dpi’
- The *colorspace* is ‘CMYK’
- *PS language level* is ‘2’
- The *image compression* is ‘RLE’

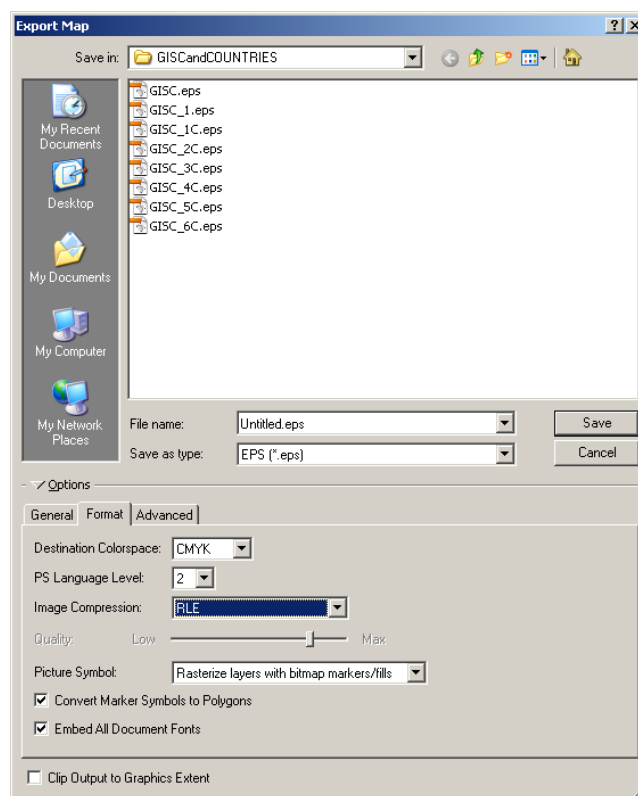


Figure 2.7: Export settings in ArcGIS

- The *Picture symbol* is set to ‘Rasterize layers with bitmap markers/files’
- The ‘*Convert marker symbols to polygons*’
- The ‘*Embed all document fonts*’ should be check marked.

It is recommended to examine the output file in Adobe or other image editing software to verify that the resulting map is satisfactory.

The output file in eps, pdf- or ai-format should be delivered to the EEA QC-team together with the relevant underpinning GIS data, tabular data, shape-files and metadata.

Read more about data delivery in this document: “Data guide for EEA map production”, provided by EEA at this link: http://www.eionet.europa.eu/gis/docs/GISguide_v4_EEA_GIS_data_and_map_production.pdf

Read more about map colours in this document: “Colours and colour scales to be used by the EEA”, provided by EEA at this link: <http://www.eionet.europa.eu/gis/docs/EEA%20Corporate%20identity%20manual%20Map%20colour%20guide.pdf>