
	Ref	GLOBCORINE_2009_PDM_1.3		
		Issue	Page	Date	
		1.rev.3	1	13/12/2010	

# GLOBCORINE 2009

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## Product Description Manual



European Environment Agency






Milestone	Final meeting
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		Ref	GLOBCORINE_2009_PDM_1.3		
		Issue	Page	Date	
		1.rev.3	2	13/12/2010	

---

## *Table of contents*

<b>ACRONYMS .....</b>	<b>3</b>
<b>1. PRODUCTS SUMMARY .....</b>	<b>4</b>
1.1. General content .....	4
1.2. Data Source .....	4
1.3. Data access .....	5
<b>2. PRODUCTS NOMENCLATURE.....</b>	<b>6</b>
<b>3. PRODUCT SPECIFICATION .....</b>	<b>7</b>
<b>4. DATA POLICY .....</b>	<b>10</b>

		Ref	GLOBCORINE_2009_PDM_1.3		
		Issue	Page	Date	
		1.rev.3	3	13/12/2010	

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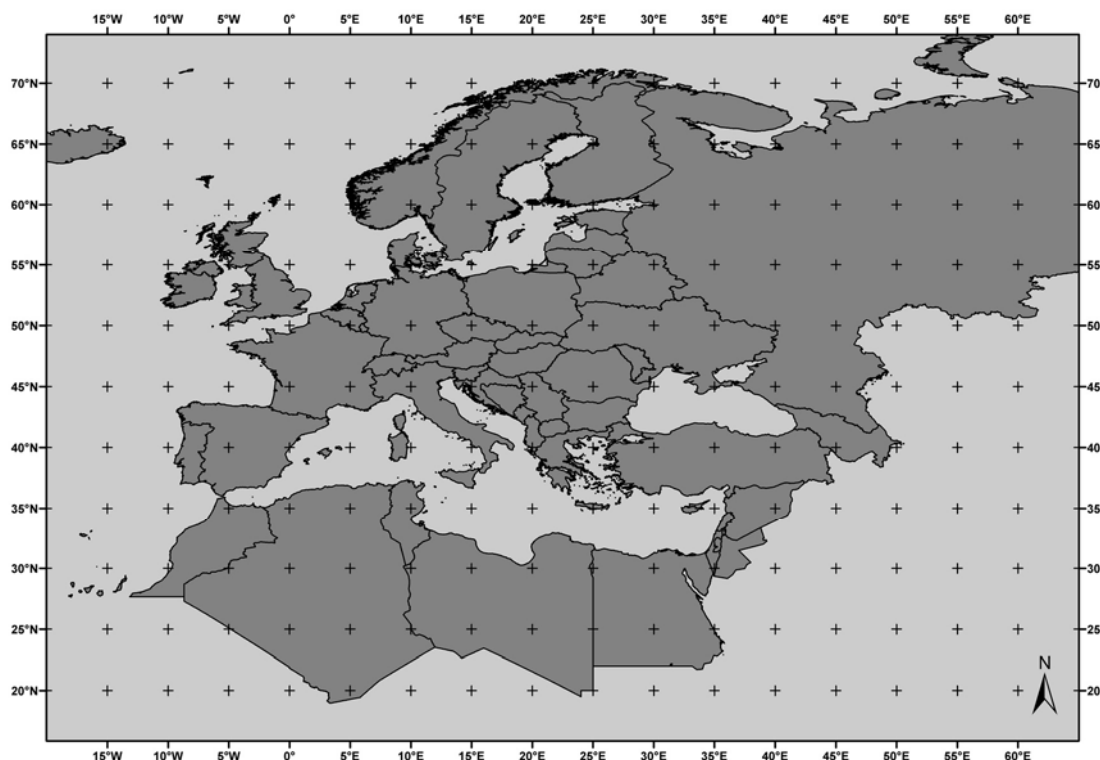
## *Acronyms*

CLC	: Corine Land Cover
ENVISAT	: ESA Environmental Satellite
FRS	: Full Resolution Full Swath
LCCS	: Land Cover Classification System
MERIS	: Medium Resolution Imaging Spectrometer Instrument ( <a href="http://envisat.esa.int">http://envisat.esa.int</a> )
TOA	: Top Of Atmosphere

# 1. Products summary

## 1.1. General content

The GlobCorine 2009 land cover map has been generated over the period spanning the entire year 2009 (1<sup>st</sup> January to 31<sup>st</sup> December). The product covers the European continent extended to the Mediterranean basin, as shown in Figure 1.






*Figure 1: Pan-European extent of the GlobCorine 2009 land cover map*

It is derived from an automatic and regionally-tuned classification of a time series of MERIS seasonal and annual mosaics. The product nomenclature is as compatible as possible with the CLC aggregated typology, while presenting an LCCS-based structure.

The product is available in the GeoTIFF format and stored in a zip archive named “GlobCorine\_LC\_200901\_200912.zip” enriched with additional files.

## 1.2. Data Source

The GlobCorine 2009 land cover map has used on ENVISAT’s Medium Resolution Imaging Spectrometer (MERIS) Level 1B data acquired in the Full Resolution mode with a spatial resolution of 300 meters. For the generation of the Level 1B data, the raw data acquisitions have been resampled on a path-oriented grid, with pixel values having been calibrated to match the Top Of Atmosphere (TOA) radiance. The GlobCorine 2009 project is based on 12




		Ref	GLOBCORINE_2009_PDM_1.3		
		Issue	Page	Date	
		1.rev.3	5	13/12/2010	

months of MERIS Fine Resolution Full Swath (FRS) data, from the 1<sup>st</sup> January 2009 until the 31<sup>st</sup> December 2009.

Further information about the ENVISAT MERIS Mission is available at the MERIS home page ENVISAT MERIS Mission (<http://envisat.esa.int/object/index.cfm?fobjectid=1665>).

### 1.3. Data access

The GlobCorine product is available through the ESA Ionia server at: <http://ionial.esrin.esa.int/globcorine>.

		Ref	GLOBCORINE_2009_PDM_1.3		
		Issue	Page	Date	
		1.rev.3	6	13/12/2010	

## 2. Products nomenclature

The GlobCorine Land Cover Map name follows the general nomenclature (Table 1):

GLOBCORINE\_LC\_[YsYsYsYsMsMs]\_[YeYeYeYeMeMe].tif




Field	Signification	Value
GLOBCORINE	Project Acronym	GLOBCORINE
LC	Product Name	LC
YsYsYsYsMsMs	Start Year (YsYsYsYs) and start month (MsMs) of mosaic	200901
YeYeYeYeMeMe	End Year (YeYeYeYe) and end month (MeMe) of mosaic	200912

Table 1: GlobCorine land cover product name nomenclature

Table 2 list the parameters used for the projection processing of the GlobCorine land cover map.

Field	Description
Projection	Plate-carrée
Reference ellipsoïd	WGS 84 ( $R_e$ =Equatorial Radius= 6378,14km; $R_p$ =Polar Radius=6356,76 km)
Angular pixel resolution	$Res_{deg} = 1/360$ degree
Kilometric pixel resolution	<p>height: <math>h[km] = r * (2\pi/360) * Re s_{deg}</math></p> <p>width : <math>w[km] = R_e * \cos(lat) * (2\pi/360) * Re s_{deg}</math></p> <p>with <math>r = \frac{R_e * R_p}{\sqrt{R_e^2 * \sin^2(\theta_c) + R_p^2 * \cos^2(\theta_c)}}</math></p> <p>and <math>\tan(\theta_c) = (1 - f)^2 * \tan(lat)</math></p> <p>and <math>f = \frac{(R_e - R_p)}{R_e}</math></p> <p>(h is variable between <math>2\pi/360 * R_e * Re s_{deg}</math> at the Equator and <math>2\pi/360 * R_p * Re s_{deg}</math> at the Pole)</p>
Upper Left corner of Upper Left pixel	Upper Left corner of Upper Left pixel longitude: -20° E Upper Left pixel of Upper Left pixel latitude : 75° N

Table 2: GlobCorine products geographic location information








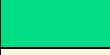





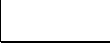
		Ref	GLOBCORINE_2009_PDM_1.3		
		Issue	Page	Date	
		1.rev.3	7	13/12/2010	

### 3. Product Specification

The GlobCorine 2009 land cover product is available in a zip archive containing the GlobCorine land cover map (2 raster TIFF files), the associated legend (.xls), a quicklook of the GlobCorine land cover map (.jpg) and a “ReadMe” document (.pdf). An explanation of that content is provided below.

- **The GlobCorine 2009 land cover map**

The GlobCorine 2009 land cover product has been designed to be a consistent continental land cover map. Therefore, the legend is determined by the level of information that is available and that makes sense at the scale of the pan-European continent. The GlobCorine legend counts 14 classes and meets this requirement (Table 3). In addition, it is compatible both with the Corine Land Cover (CLC) aggregated typology and with the Land Cover Classification System (LCCS).




NB_LAB	LAB	Color
10	Urban and associated areas	
20	Rainfed cropland	
30	Irrigated cropland	
40	Forest	
50	Heathland and sclerophyllous vegetation	
60	Grassland	
70	Sparsely vegetated area	
80	Vegetated low-lying areas on regularly flooded soil	
90	Bare areas	
100	Complex cropland	
110	Mosaic cropland / natural vegetation	
120	Mosaic of natural (herbaceous, shrub, tree) vegetation	
200	Water bodies	
210	Permanent snow and ice	

*Table 3. 14 classes of the GlobCorine legend*

A 15<sup>th</sup> class (coded as “230”) has been added to the final legend to account for no data pixel-values or for areas that are not covered by the project.

The **delivered GlobCorine 2009 land cover product** is provided in a GeoTIFF format as single-band and RGB files, according to the following nomenclature:

- GLOBCORINE\_LC\_200901\_200912.tif: land cover map with the 14 classes as a single-band file

		Ref	GLOBCORINE_2009_PDM_1.3		
		Issue	Page	Date	
		1.rev.3	8	13/12/2010	

- GLOBCORINE\_LC\_200901\_200912\_Color.tif: land cover map with the 14 classes as a RGB file

Two files, named “GlobCorine2009\_Legend.lyr” and “GlobCorine2009\_Legend.dsr” are added, which contain the color map of the GlobCorine land cover, in ARC/INFO (.lyr) and Envi (.dsr) formats.

The description of the single-band format is given in Table 4. The specification of the RGB format is described in Table 5. According to this format, the land cover map is presented in a coloured version, each band of the file standing for the R, G and B values of the color code.

Parameter	Description	Type	Range
Object ID	The value corresponding to the number of class (not related to the legend)	BYTE	[0 14]
Value	The class value corresponding to the associated legend	BYTE	[10 230]
Count	The number of pixels in the corresponding class	BYTE	[0 10 <sup>8</sup> ].

Table 4: Specifications of the GlobCorine Land Cover map single-band file

Parameter	Description	Type	Range
Object ID	The value corresponding to the number of class (not related to the legend)	BYTE	[0 255].
Value	The class value corresponding to the associated legend	BYTE	[0 255]
R	The value corresponding to the Red color code	BYTE	[0 1]
G	The value corresponding to the Green color code	BYTE	[0 1]
B	The value corresponding to the Blue color code	BYTE	[0 1]

Table 5: Specifications of the GlobCorine Land Cover map RGB file

- **The GlobCorine legend**

It is presented in an Excel file named “GlobCorine2009\_legend.xls”, described in Table 6.

Field	Signification	Value
Value	This field indicates the ID value for the considered class	[10 230]
Label	This field describes the thematic content for the considered class	String
Color Red	This field indicates the Red color code	[0 255]
Color Green	This field indicates the Green color code	[0 255]
Color Blue	This field indicates the Blue color code	[0 255]






		Ref	GLOBCORINE_2009_PDM_1.3		
		Issue	Page	Date	
		1.rev.3	9	13/12/2010	

Table 6: Description of the Excel file associated with the land cover / land use product




- **A quicklook of the GlobCorine land cover map**  
It is presented as a file named “GlobCorine2009\_Preview.jpg”.
- **A “ReadMe” document**  
It is presented as a file named “GlobCorine2009\_ReadMe.pdf”.

#### RECOMMENDATIONS OF USE

As already demonstrated by the Corine experience in change mapping, it is important to recall that reliable change detection can never be achieved by comparing two independent successive land cover maps. Therefore, **the GlobCorine 2009 land cover map cannot be used for any change detection application.** In particular, **the direct comparison with the previous GlobCorine 2005 product should be avoided** since it cannot guarantee accurate land cover change quantification.

The GlobCorine maps are provided as they are, with a quantified error and their accuracy surely prevents any consistent comparison with older maps to depict the change area. Indeed, the change rate will always be much lower than the classification errors, thus hampering any relevant use for change mapping.

More information about the GlobCorine 2009 product can be found in the “GlobCorine 2009 – Description and Validation Report” (also available through the ESA Ionia server at: <http://ionial.esrin.esa.int/globcorine> ).

		Ref	GLOBCORINE_2009_PDM_1.3		
		Issue	Page	Date	
		1.rev.3	10	13/12/2010	

## 4. Data Policy

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The GlobCorine land cover map is made available to the public by ESA. You may use the GlobCorine land cover map for educational and/or scientific purposes, without any fee on the condition that you credit ESA and Université Catholique de Louvain, as the source of the GlobCorine products.

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Should you write any scientific publication on the results of research activities that use GlobCorine product as input, you shall acknowledge ESA and Université Catholique de Louvain in the text of the publication and provide ESA with an electronic copy of the publication ([due@esa.int](mailto:due@esa.int)). Also you should contact ESA if you would like to use GlobCorine for any commercial activity.