

# CLC2018

## Production overview

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Eionet NRC Land Cover meeting

*Copenhagen 9-10 October 2017*



# CLC2018 Timeline

## CLC2018 planning principles

- Ensuring CLC continuity
  - Increased focus on timeliness of end products
- Ambitious timeline

## Reality

Delay in preparation

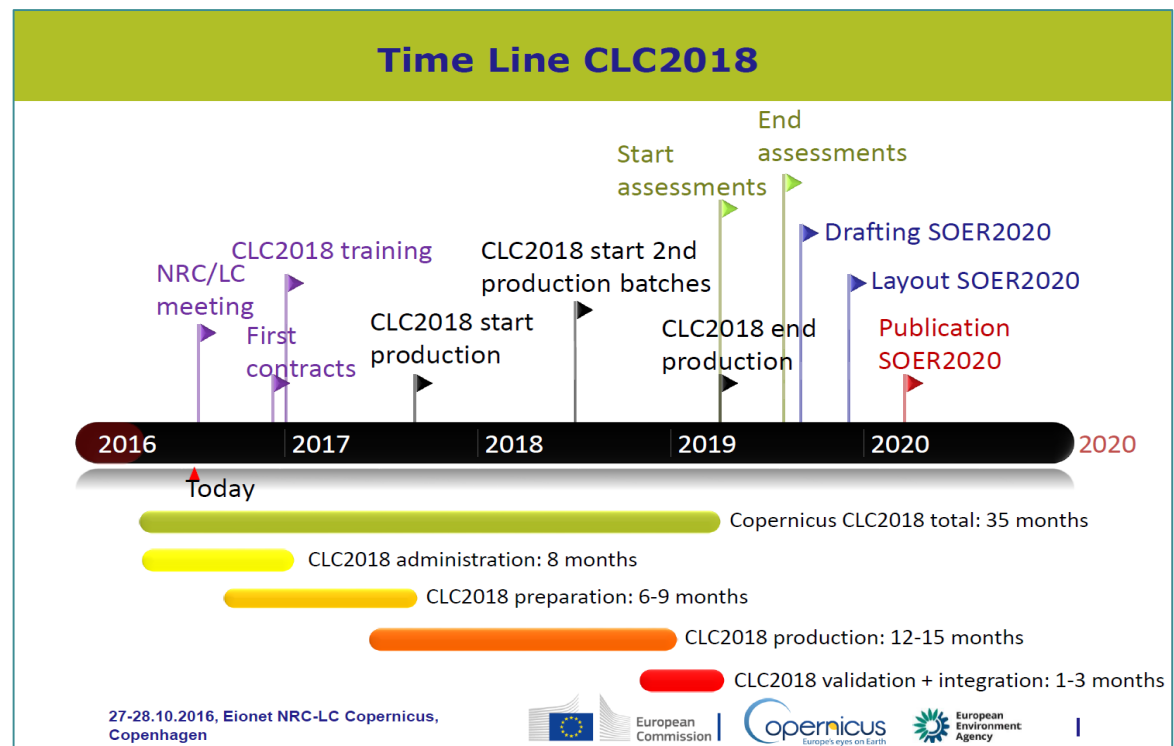
Production start in Q4 2017

→ ~8 months behind schedule

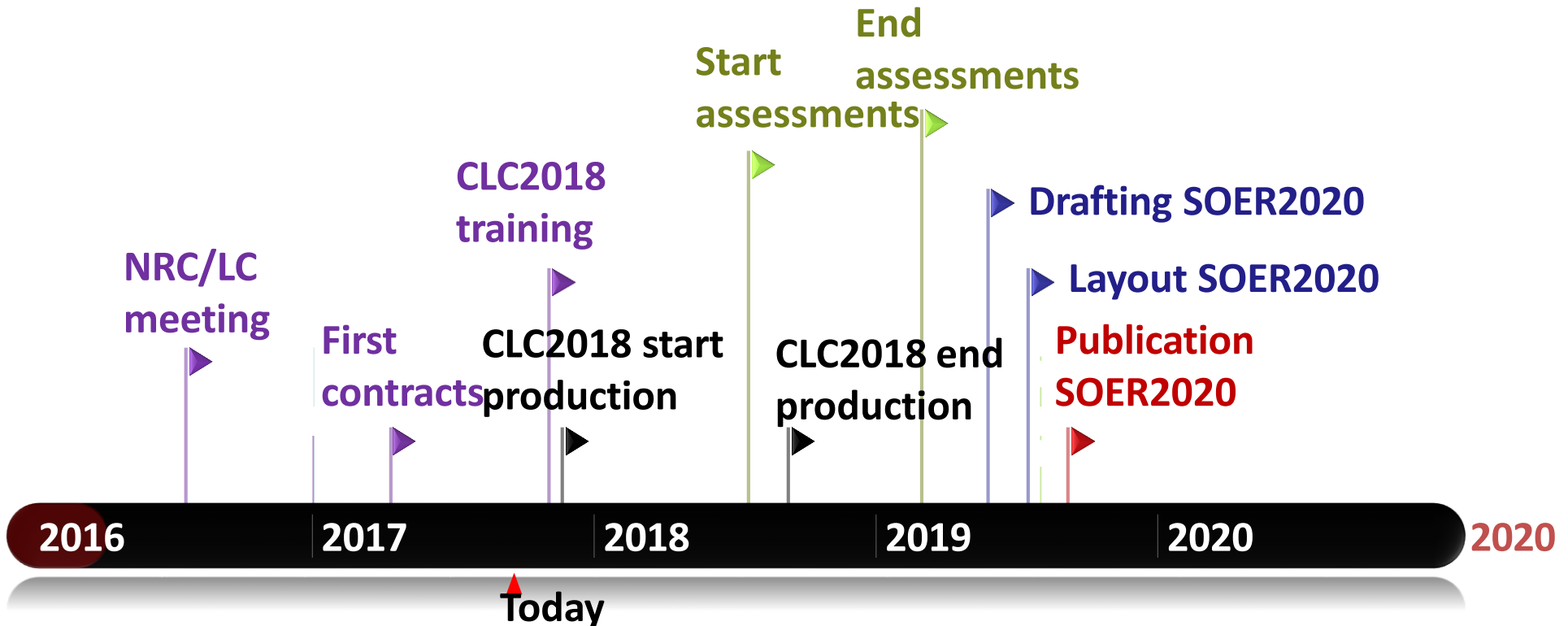
→ heavy time pressure

„CLC2018 questionnaire answers:

- Time needed to start work following contract signature: 0 - 8 months
- Time needed for CLC mapping: 2 - 18 months”



# New Time Line CLC2018



**Copernicus CLC2018 total: 24 months**

**CLC2018 administration: 8 months**

**S2 image preparation: 2 acquisition seasons**

**CLC2018 production: 10 months**

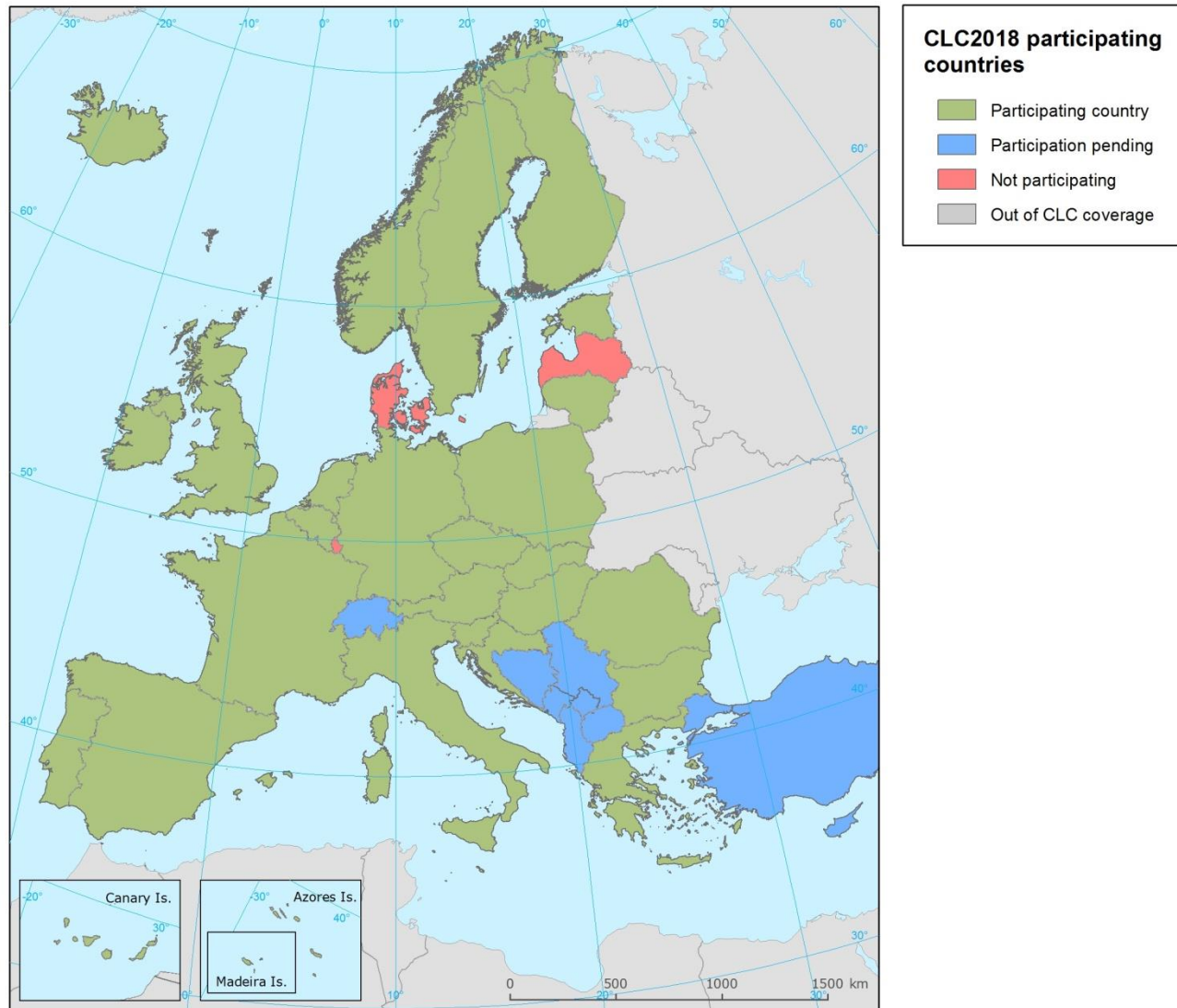
**CLC2018 validation + integration: 1-3 months**

# CLC heritage overview

	CLC1990	CLC2000	CLC2006	CLC2012	CLC2018
<b>Satellite data used</b>	Landsat-4/5 TM single date (in a few cases Landsat MSS)	Landsat-7 ETM single date	SPOT-4 and / or IRS LISS III dual date	IRS, SPOT-4/5 and RapidEye	Sentinel-2 and Landsat-8 for gap filling
<b>Time consistency</b>	1986-1998	2000 +/- 1 year	2006 +/- 1 year	2011-2012	2017-2018
<b>Geometric accuracy satellite images</b>	≤ 50 m	≤ 25 m	≤ 25 m	≤ 25 m	≤ 10 m (Sentinel-2)
<b>MMU</b>	25 ha	25 ha	25 ha	25 ha	25 ha
<b>MMW</b>	100 m	100 m	100 m	100 m	100 m
<b>Geometric accuracy CLC data</b>	100 m	better than 100 m	better than 100 m	better than 100 m	better than 100 m
<b>Thematic accuracy</b>	≥ 85% (probably not achieved)	≥ 85% (achieved)	≥ 85%	≥ 85% (probably achieved)	≥ 85%
<b>Change mapping</b>	–	boundary displacement min. 100 m; change area for existing polygons ≥ 5 ha; isolated changes ≥ 25 ha	boundary displacement min. 100 m; all changes > 5 ha must be mapped	boundary displacement min. 100 m; all changes > 5 ha must be mapped	boundary displacement min. 100 m; all changes > 5 ha must be mapped
<b>Production time</b>	13 years	5 years	4 years	3 years	1,5 years
<b>Documentation</b>	incomplete metadata	standard metadata	standard metadata	standard metadata	standard metadata
<b>Access to data</b>	unclear dissemination policy	dissemination policy agreed from the start	free access for all kind of users	free access for all kind of users	free access for all kind of users
<b>Number of countries involved*</b>	22 (28)	32 (39)	38 (39)	39	not yet known

\* During the official lifetime of the project (with countries joining later)

# CLC2018 participation



# Workflow, role of partners

Tasks	NRC	EEA ETC/ULS	ESA	Service provider
Satellite data acquisition (Sentinel-2 and Landsat 8)			X	
Satellite image ortho-correction			X	
Technical preparation of IMAGE2018 (Sentinel-2 and Landsat-8 (gap-filling) image provision)	x	x		X
Technical support (training, guidelines)		X		
In-situ and ancillary data collection	X			
CLC change mapping 2012-2018	X	x		
Generating CLC2018	X	x		
Verification by Technical Team	x	X		
Validation				X
CLC data dissemination	X	X		
Project management (NRCs)	X	X		x
X = lead organisation				
x = organisation involved				

# Technical documents

Subject / Title	Status
CLC2018 Technical guidelines	updated (single document)
CORINE Land Cover nomenclature guidelines	text and image stock significantly updated online version created
Manual of CORINE Land Cover changes	updated
A macro programme for generating CLC2018	updated
CLC QC Quick Guide - online / off-line manual	updated
CLC2018 Support Package (software and user guide)	updated ( <i>see presentation after coffee break</i> )

**Documents (will be) available under:**

[https://forum.eionet.europa.eu/nrc\\_land\\_covers/library/copernicus-2014-2020/pan-european-component/corine-land-cover-clc-2018/technical-guidelines/](https://forum.eionet.europa.eu/nrc_land_covers/library/copernicus-2014-2020/pan-european-component/corine-land-cover-clc-2018/technical-guidelines/)

# CLC nomenclature enhancement

## Enhancement needed

- Newly emerging phenomena (e.g. renewable energy production, nature reconstruction, energy plantations)
- New mapping methodologies requiring different, more „machine-readable” class descriptions (components, percentages)
- Extension of mapping (Nordic countries, Turkey) - new phenomena to be mapped (eg. inland salt lakes)
- Overlaps, gaps and inconsistencies discovered

## Enhancement based on

- experiences of implementing countries during former CLC inventories,
- problematic issues revealed by the CLC Technical Team
- considerations connected to the concept of EAGLE (Eionet Action Group on Land Monitoring in Europe)
- critical remarks collected from NRC LCs in the CLC2018 questionnaire
- image stock collected by CLC TT and ETC experts



# CLC nomenclature enhancement

Enhancement in two steps

**2014** (ETC/SIA) – *made available during CLC2012*

- EAGLE-ization: description with LC and LU, lists of „(not) applicable for” phenomena, „included/excluded” elements
- removing inconsistencies

**2017** (ETC/ULS)

- updating image stock
- building in NRC remarks (questionnaire)
- adding newly emerging phenomena
- adding new and removing unneeded particularities
- online version created

# CLC nomenclature enhancement

## Examples of clarification in 2nd step:

**121** – completing the „applicable for“ list, clarifying agro-industry

**131** – clarifying generalization rules

**133** – new particularity: nature (re)construction areas

**211** – clarifying fodder crops

**231** – clarifying description, new particularity: non-used parcels between buildings and around settlements

**31x** – adding short-rotation forest and coppice forests

**321** – identification keys added, particularity alpine meadows clarified

**322 / 412** – separation clarified

**322 / 333** – lichen heath areas clarified

**324** – examples of woodland degradation / forest formation

**335** – significantly enhanced, rock glaciers added

**511** – branching glacial rivers added

**523** – significantly enhanced, floating aquaculture added

# CLC nomenclature enhancement

## 523 Sea and ocean

Zone seaward of the lowest tide limit.

This class is applicable for:

- sea surface below lowest tide limit;
- fjords, fjärds, and sea lochs;
- off-shore floating aquaculture facilities for fish, shellfish or macroalgae production.

This class includes:

- sea water;
- floating marine vegetation (macroalgae);
- floating aquaculture installations, such as cages, tanks, buoy lines;
- (>100 m wide) coast defence structures (breakwaters, seawalls, sea dikes, groins, jetties) stretching into the sea.

This class is not applicable for:

- archipelago of lands located inside sea/ocean areas;
- sea water areas as part of port areas that include sea water to reach a zone >25 ha (class 123);
- off-shore aquaculture installations, such as tanks, basins, buildings (class 121).



Fig. 176 Example 523: Skagerrak, where the Skagerrak and Kattegat straits meet (Denmark). Photo: Gy. Büttner.



Fig. 177 Example 523: Lyse fjord near Stavanger (Norway). Photo: Gy. Büttner.

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Fig. 178 Example 523: The Atlantic Ocean at VÍK (Iceland). The coast is black because of the basaltic rocks. Photo: Gy. Büttner.



Fig. 179 Example 523: Floating cages of off-shore aquaculture (Faroe Islands). Photo: B. Kozzra.

Generalisation:

- The same generalisation rule as for archipelago of lakes (class 512) should be applied on two conditions:
  - 1) island polygon > 25 ha,
  - 2) the new zone created is composed of 75% of land.

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Examples



125a: Cja



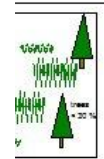
125b: str



125c: Ave



ro).Photo: B.



gmarginal


# CLC nomenclature – online version

Home Jump to list 3.2.2 - Moors and heathland


## 3.2.2 Moors and heathland

Definition Generalisation Particularity Images


Images




Alvar with junipers (Harilaid, Estonia). Source: Wikipedia




Heathland with bracken in Scottish Highlands (United Kingdom). Photo: Gy. Bütner




Lowland moors (Drenthe, the Netherlands). These lowland moors on sandy soils are not climax vegetation, but maintained as moors by (nature) management (grazing, cutting shrubs). Photo: G. Hazeu



Upland moors in Southern Norway. Photo: Gy. Bütner



Moss and lichen covered basaltic boulders (Joeland). Photo: Gy. Bütner



Particularity 322: Dwarf mountain pine shrubs (High Tatras, Slovakia). Note the low height of the shrub. Photo: B. Kosztra

colonisation, hedgerows, dwarf conifers. All abandoned meadows, pastures or forest sparse trees (< 15 % canopy closure in climax *Empetrum nigrum*, *Ledum palustre*, *Carex* and heathland – tundra (322). Mediterranean colonisation and degradation stages of broad-leaved mat-grasslands of acid soils; grasslands of mesophile pastures and hay meadows.

# CLC nomenclature – feedback

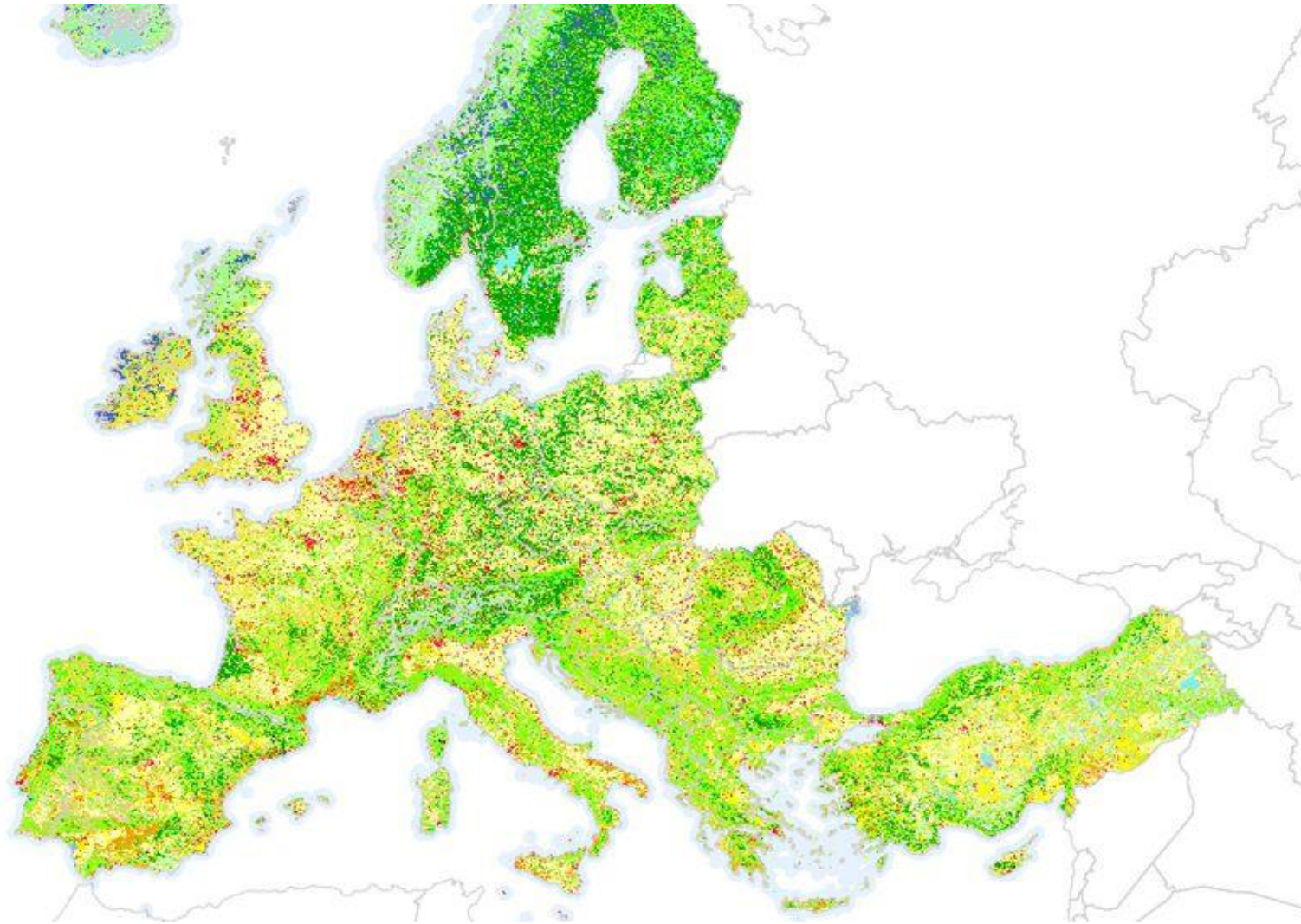
## Experts contributing to nomenclature guidelines enhancement:

- George Büttner, Barbara Kosztra, Gerard Hazeu, Stephan Arnold
- Roger Milego, Jorge Lopez Perez (online version)
- Geir-Harald Strand, Linda Aune-Lundberg, Beth Cole, Pekka Härmä, Kevin Lydon, Kolbeinn Árnason
- NRC LCs answering last years CLC2018 questionnaire

Comments on nomenclature guidelines (document and on-line version) are welcome any time at:

[kosztra.barbara@bfkh.gov.hu](mailto:kosztra.barbara@bfkh.gov.hu)

# Thank you for your attention !



NRC Land Cover meeting  
9-10 October 2017.



European Topic Centre  
on Urban, Land and  
Soil Systems

