

LIFE CROLIS PROJECT

CROatian Land Information System

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Green Week 2024, “A Path for a Resilient Future”

Portuguese Permanent Representation to the European Union, Avenue de Cortenbergh 12, Brussels

13th June 2024



REPUBLIKA HRVATSKA
Ministarstvo zaštite okoliša
i zelene tranzicije



AGENCIJA ZA
PLAĆANJA U
POLJOPRIVREDI,
RIBARSTVU I
RURALNOM
RAZVOJU

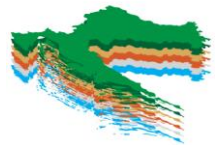


REPUBLIKA HRVATSKA
Državna geodetska uprava



FOND ZA ZAŠTITU OKOLIŠA I
ENERGETSKU UČINKOVITOST





LULUCF sector and CROLIS project

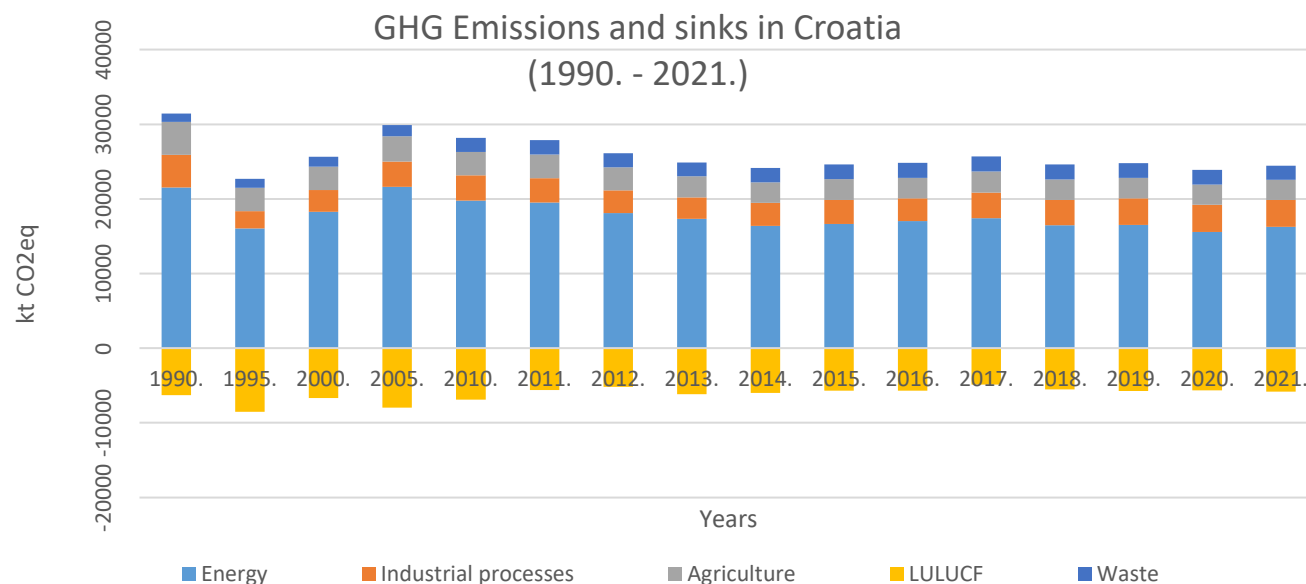
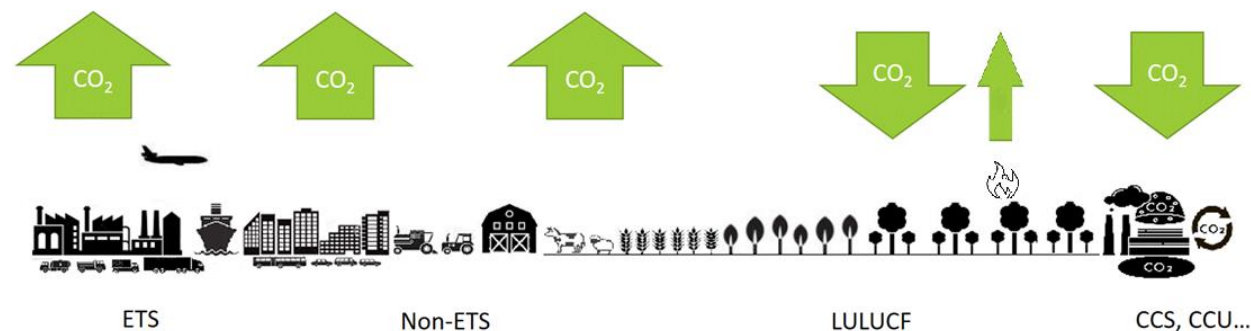


EU Green Deal and „Fit for 55%“ EC Initiative:

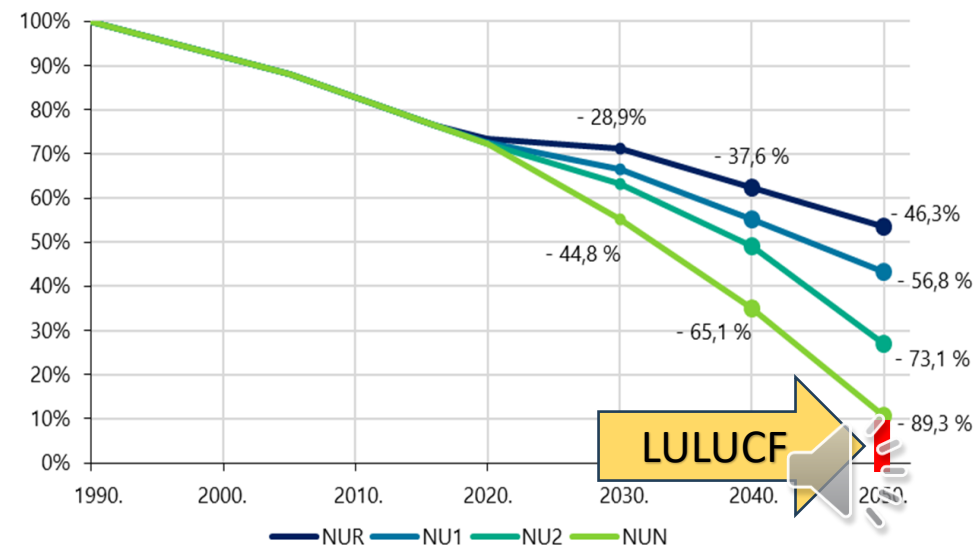
- Reduction of GHG emissions for 55% by 2030
- Climate neutrality by 2050

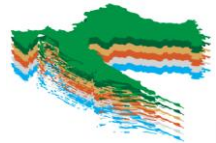
National GHG emissions inventory 1990 – 2021 and projections by 2050:

- Croatia, and EU would not be able to reduce GHG emission to 0% by 2050
- GHG sinks in the LULUCF sector (*Land use, land use change and forestry*) should be estimated or calculated and used to cover the discrepancy
- Precise and reliable calculation of the GHG sinks is needed



GHG emissions projections with application of different sets of measures





LIFE CROLIS - introductory



Project deals with the development of a harmonized data model for land monitoring in the Republic of Croatia. This project has also unique demonstrative character in the EU.

Key objectives

- To develop and set-up the first multi-scale and multi-purpose land monitoring system in Croatia
- To apply CROLIS data for the LULUCF reporting and accounting purposes in line with the requirements of international (UNFCCC, KP, PA) and EU legislation
- To enable and secure a permanent CROLIS implementation by national authorities, decision makers, experts, NGOs and other stakeholders
- To provide a robust basis for planning and implementation of GHG mitigation actions in the LULUCF sector

Implementation actions

- C1 - CROLIS data concept & model
- C2 - Sample based system for historic Land cover (LC) and Land use (LU)
- C3 - Mapping of LC and LU (wall-to-wall mapping) for the establishment of land monitoring system
- C4 - CROLIS Database & Service implementation
- C5 - Capacity building for CROLIS reporting
- C6 - Sustainability of CROLIS

LIFE CROLIS at a glance

Coordinating beneficiary:

- Ministry of Environment Protection and Green Transition (MEPGT)

Associated Beneficiaries:

- Paying Agency in Agriculture, Fishery and Rural Development (PAAFRD)
- State Geodetic Administration (SGA)
- Croatian Forests Ltd. (CF)
- Ekoner Ltd. (EKONER)

Advisory Board

- technical advise with international members (AT, UK, HR)

Duration of the project: 75 months

- 1.10.2020-30.4.2024-31.12.2026

Total value of the project:

- EUR 6,248,735

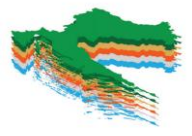
EU co-financing (LIFE Programme):

- EUR 2,588,207

Employees:

- 27 (vary 22-36)

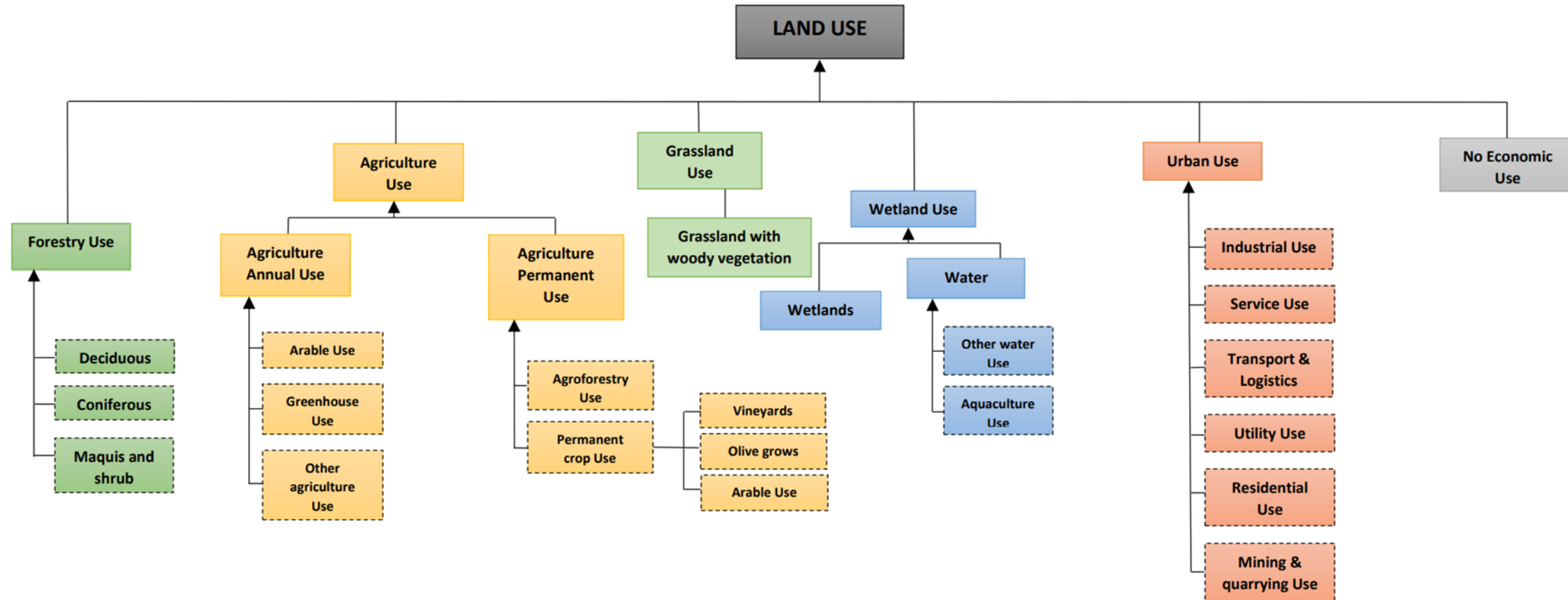


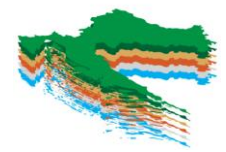


C 1 - CROLIS Land use (LU) Conceptual model

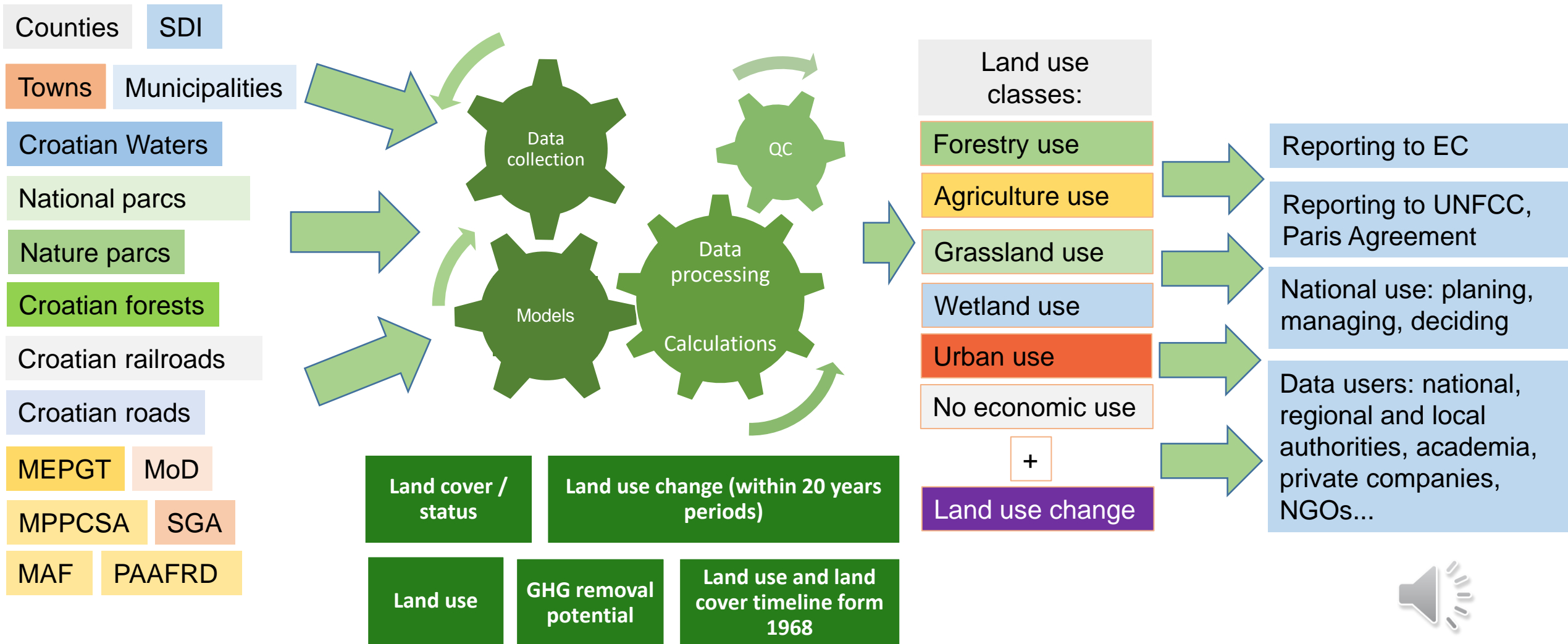
Level 1

Level 2





CROLIS



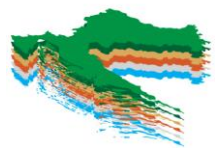
C 3 - CROLIS Land use (LU) 2020 layer – Latest version



Priority	Class (Level 2)	CROLIS LU layer – Last version (ha)
1	Deciduous forest	1,654,820
1	Coniferous forest	239,865
1	Maquis and shrub	559,841
2	Arable Use	1,329,541
3	Grassland Use	1,080,877
4	Permanent crop Use	140,919
6	Greenhouse Use	357
7	Other agriculture Use	18,948
8	Wetland Use	25,619
9	Aquaculture use	9,516
10	Other water Use	61,581
11	Residential Use	121,704
12	Industrial Use	11,573
13	Service Use	9,998
14	Transport & Logistic Use	30,088
15	Utilities Use	1,640
16	Mining and quarrying Use	4,228
17	Other/no economic Use	197,142
18	Grassland with woody vegetation	170,016

Class (Level 1)	CROLIS LU layer – Last version (ha)
Forestry Use	2,454,527
Agriculture Use	1,489,765
Grassland Use	1,250,893
Wetland Use	96,717
Urban Use	179,230
No economic Use	197,142





C 3 - CROLIS Land Cover (LC) 2020 layer Classification (1)



Land Cover Classification for referent year 2020:

Input spatial data:

- raster data:
 - Sentinel-2, State orthophoto RGB+CIR production, Lidar nDSM
- vector data:
 - Map of Terrestrial Non-forest habitats, ARKOD Database, Main Topographic Database, Open Street Map data; Databases of Croatian Forests Ltd., Croatian Waters Ltd., Croatian Roads Ltd., Croatian Railroads Ltd, ...

Methodology:

- Object Based Image Analysis
- eCognition

Output spatial data:

- wall to wall map
- 6 LC categories:
 - Woody Surfaces, Crops Surfaces, Grassland Surfaces, Water Surfaces, Artificial Surfaces, Bare land Surfaces

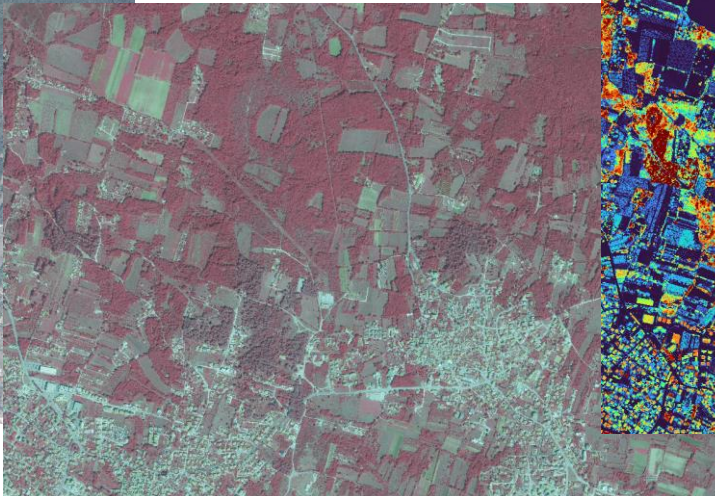
Sentinel-2



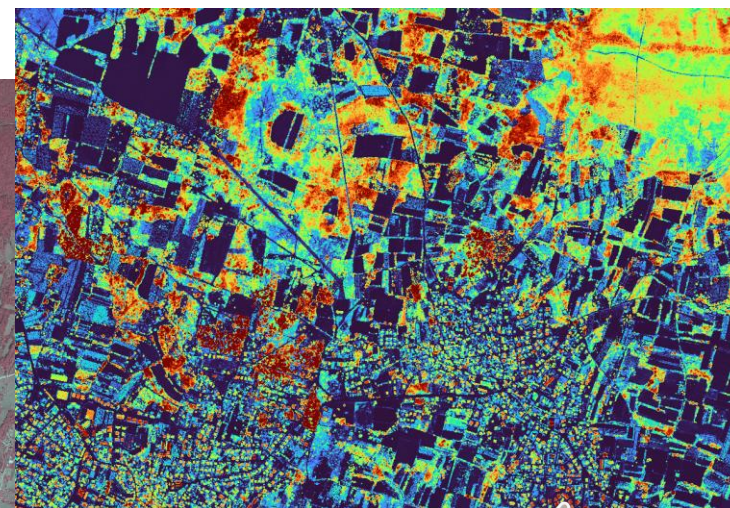
State orthophoto RGB



State orthophoto CIR



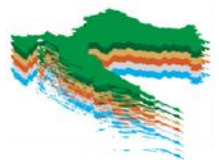
Lidar nDSM



- Land Cover Classification for historic years: GRID based

SGA and EKONERG Ltd.

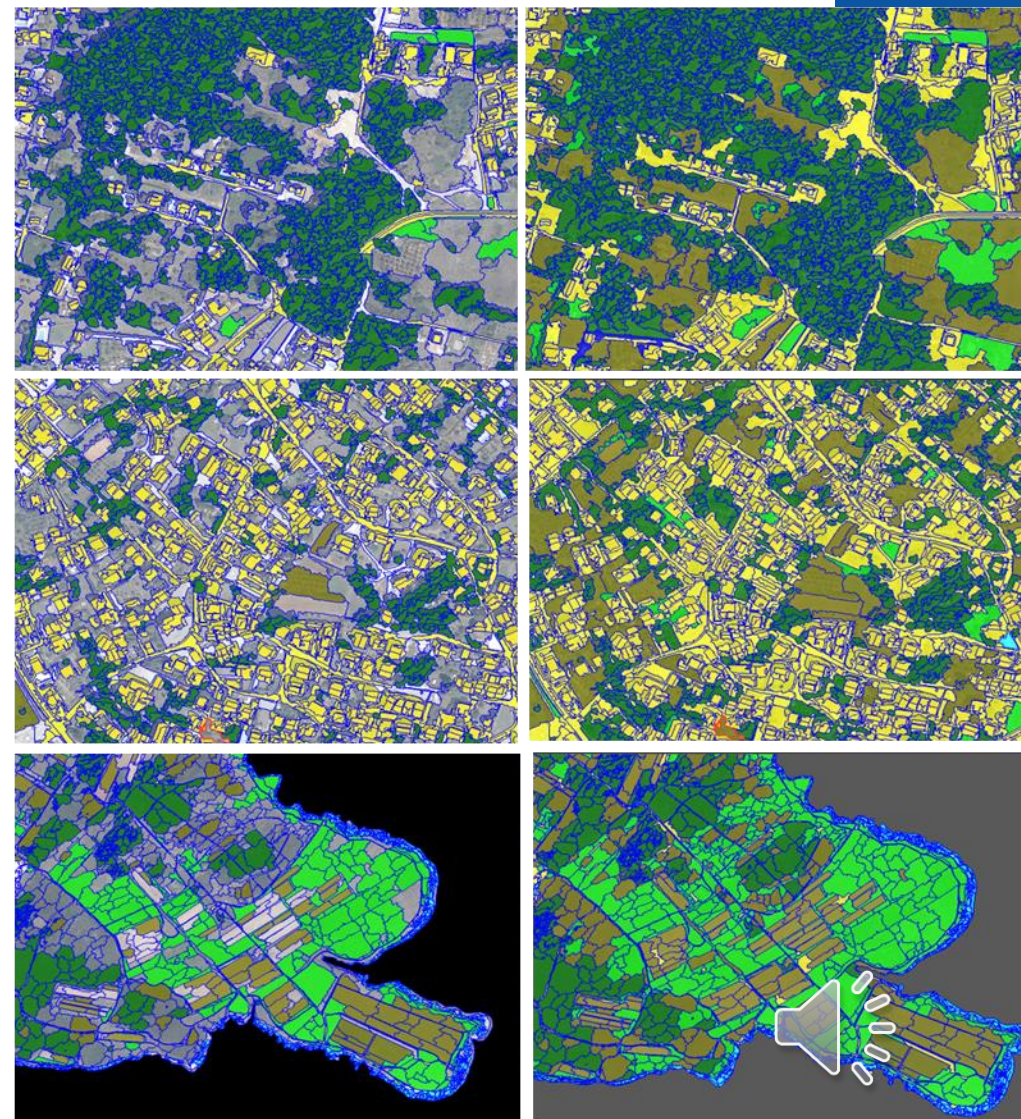




CROLIS Land Cover 2020 layer Classification (2)

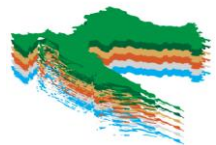


- Test area Istra
 - OBIA
- Machine learning classification - SVM
- First results of Land Cover Classification



EKONERG Ltd.

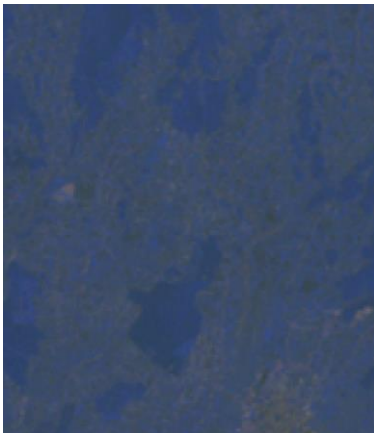




C 2 -Sources for historical period



1973.
Landsat 1-3 MSS
- resolution: 60 m
- bands: R,G,NIR



1990.
SPOT 1 satellite
- bands: R, G, NIR
- resolution: 10 m

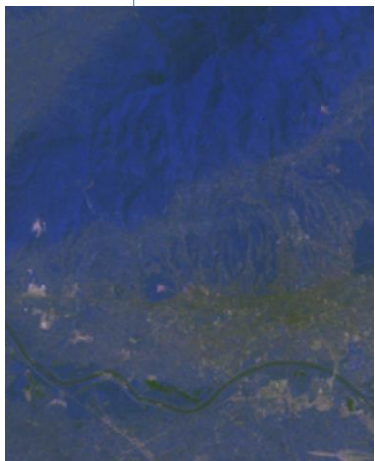
Landsat 5 TM
- 7 bands
- resolution: 30 m



2010.
Digital Orthophoto
- bands: R,G,B
- resolution: 0.5 m

SPOT 5
- R, G, NIR
- resolution: 10 m

1968.
Digital Orthophoto
- panchromatic
- resolution: 0.5 m

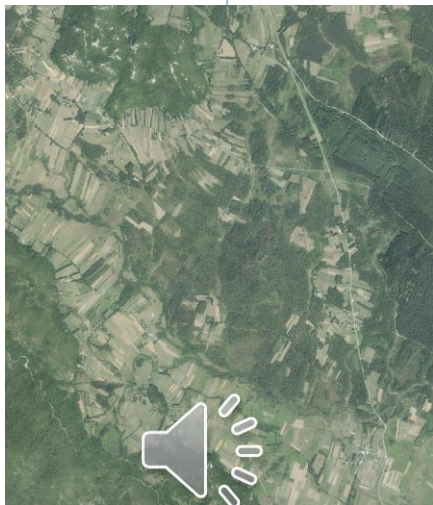


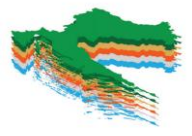
1980.
Landsat 1-3 MSS
- resolution: 60 m
- bands: R,G,NIR



2000.
SPOT 4
- R, G, NIR
- resolution: 10 m
- +/- 2 years range

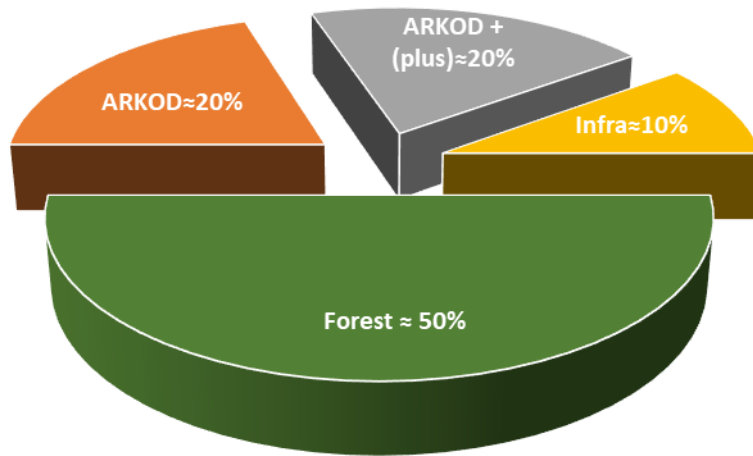
Landsat 5 TM
- 7 bands
- resolution: 30 m

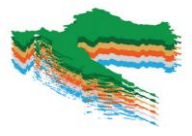




C3 - CROLIS – ARKOD+ (LPIS+) area of interest

Total land use coverage for CROATIA





PAAFRD and CF ACTIVITIES

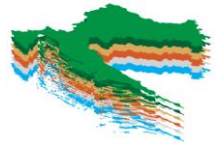
- **PAAFRD**
 - Collection and integration of vector input data for CROLIS LU layers,
 - Cooperation agreements - the legal basis for the collection of spatial data relevant to CROLIS LU
 - ARKOD+ (LPIS+) establishment – vectorization of agriculture areas outside ARKOD (LPIS)
 - CROLIS vector land use (VLU) establishment - harmonization of all vector data
 - Spatial data quality control procedures (VLU)
 - Solving spatial overlaps and filling gaps (VLU)
- **Croatian Forests**
 - Quality control and interpretation of forests data

Continental part of Croatia



Mediterranean part of Croatia (karst region)





BENEFITS from the LIFE CROLIS project



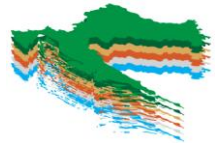
LIFE CROLIS project / LULUCF:

- It provides information on the areas of all land categories
 - Period 1970 +
- It provides information on types of land conversion for all categories of land
 - Period 1970+
- It enables the monitoring of lands
- It enables good planning
 - All activities related to land use,
 - policies in different sectors
 - strategic documents and plans including climate policy planning

LIFE CROLIS additional benefits:

- It resolves issues of jurisdiction over land (cadaster, forest management...)
- It improves and harmonizes the work of institutions in the Republic of Croatia
- It improves knowledge about spatial data in Croatian institutions
- It raises awareness of the importance of spatial data in planning climate and all related policies
- As a multifunctional system it is:
 - a single data source for all stakeholders
 - a data source for various purposes
- It is replicative – other Member states and institutions can learn from our experience





Thank you !!!

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LIFE19 GIC/HR/001270 LIFE CROLIS



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