LIFE CROLIS

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Croatian Land Information System

Networking meeting, 7th February 2024

REPUBLIKA HRVATSKA
Ministarstvo gospodarstva i održivog razvoja

AGENCIJA ZA PLAĆANJA U POLJOPRIVREDI, RIBARSTVU I RURALNOM RAZVOJU

HRVATSKE ŠUME

EKONERG

REPUBLIKA HRVATSKA
Državna geodetska uprava

FOND ZA ZAŠTITU OKOLIŠA I ENERGETSKU UČINKOVITOST

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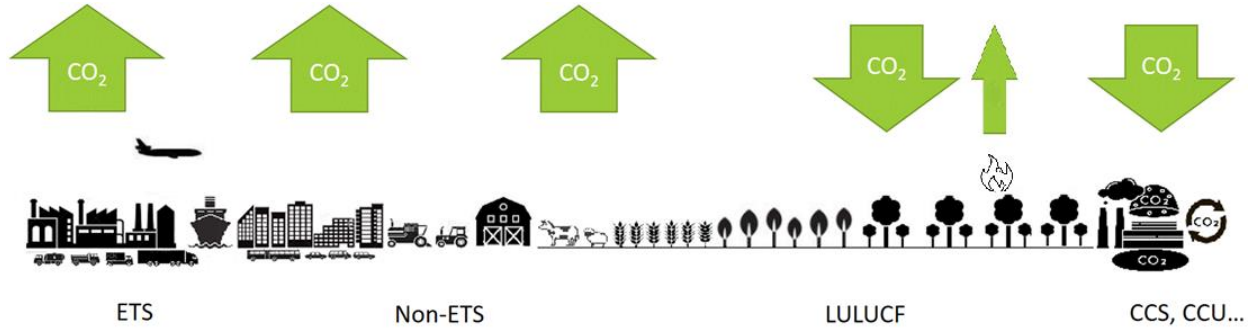
LULUCF sector and CROLIS project

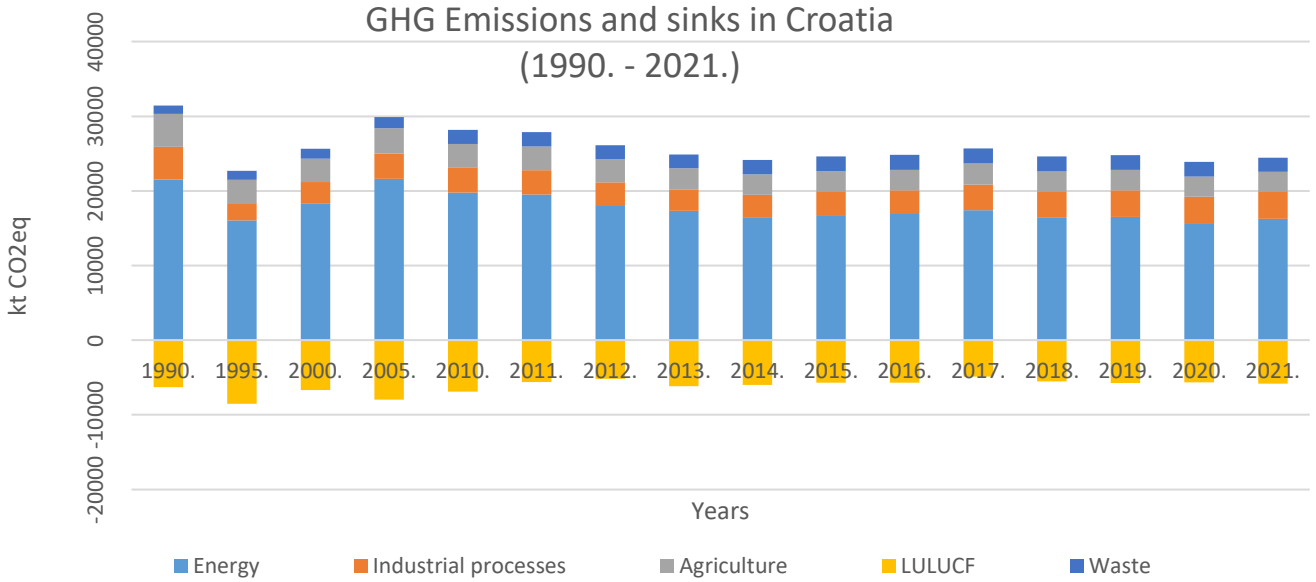
EU Green Deal and „Fit for 55%" EC Initiative:

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

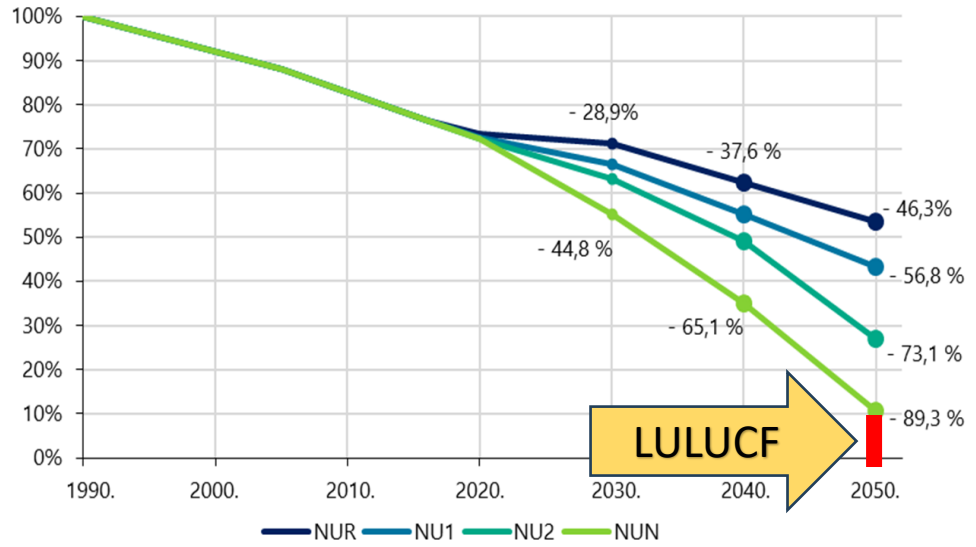
National GHG emissions inventory 1990 – 2021 and projections by 2050:

- 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 and used to cover the discrepancy
- Precise and reliable calculation of the GHG sinks is needed





GHG emissions projections with application of differnt sets of measures



LIFE CROLIS - introductory

Project deals with the development of a harmonized data model for land monitoring in the Republic of Croatia.

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 – the second demonstrative character of the CROLIS project.
- 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 LC and 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 Economy and Sustainable Development

Associated Beneficiaries:
- Paying Agency in Agriculture, Fishery and Rural Development
- State Geodetic Administration
- Croatian Forests Ltd.
- Ekonerg Ltd.

Advisory Board
- technical advise with international members

Duration of the project: 42 months
- 1.10.2020-30.4.2024
- An extensions is to be requested

Total value of the project:
- EUR 6,248,735

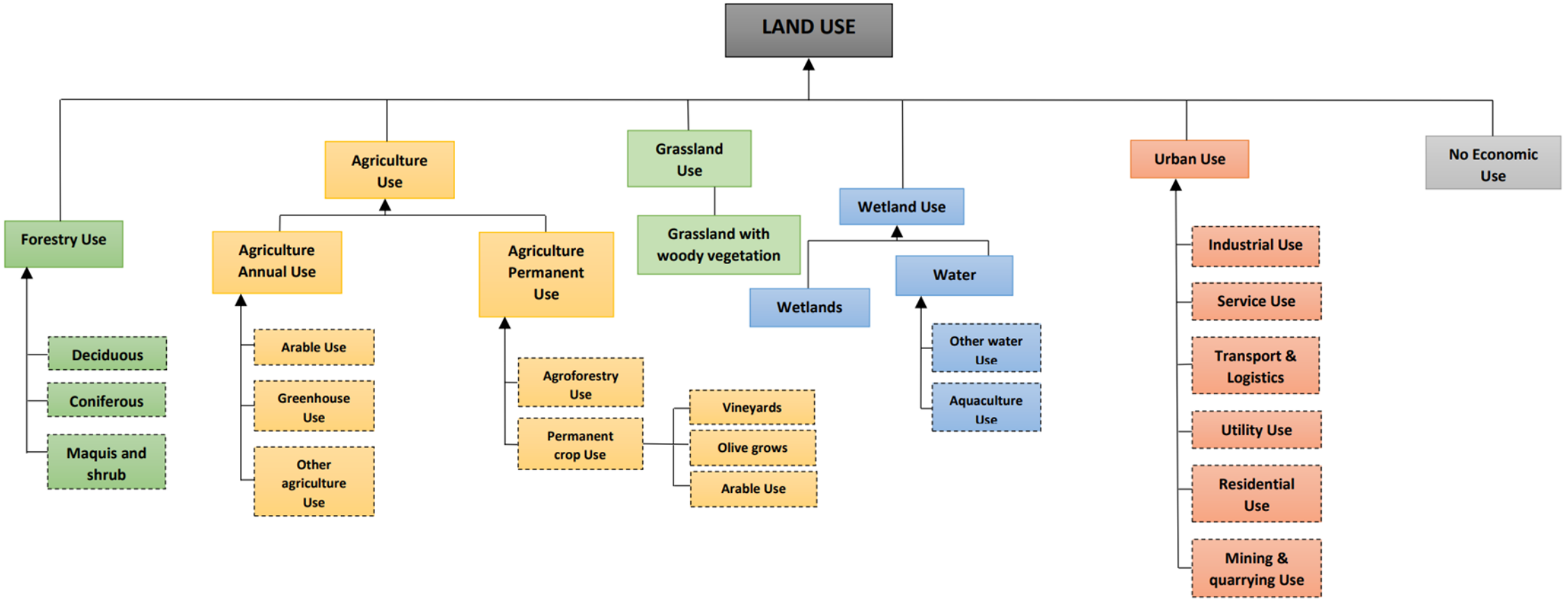
EU co-financing (LIFE Programme):
- EUR 2,588,207

Employees:
- 27 (vary 22-36)

C 1 - CROLIS LU Conceptual model

Level 1

Level 2



C 3 - CROLIS 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	Unmanaged forest area	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 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, …

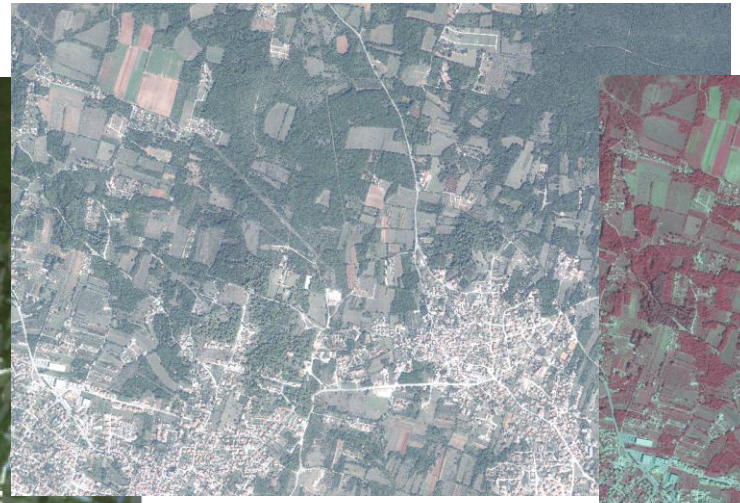
Methodology:

- Object Based Image Analysis
- eCognition

Output spatial data:

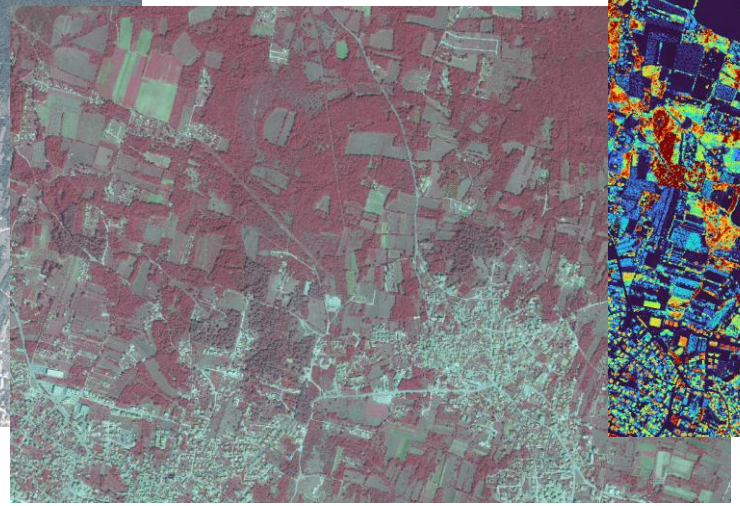
- wall to wall map
- 6 LC categories:
  - Woody Surfaces, Crops Surfaces, Grassland Surfaces, Water Surfaces, Artificial Surfaces, Bare land Surfaces

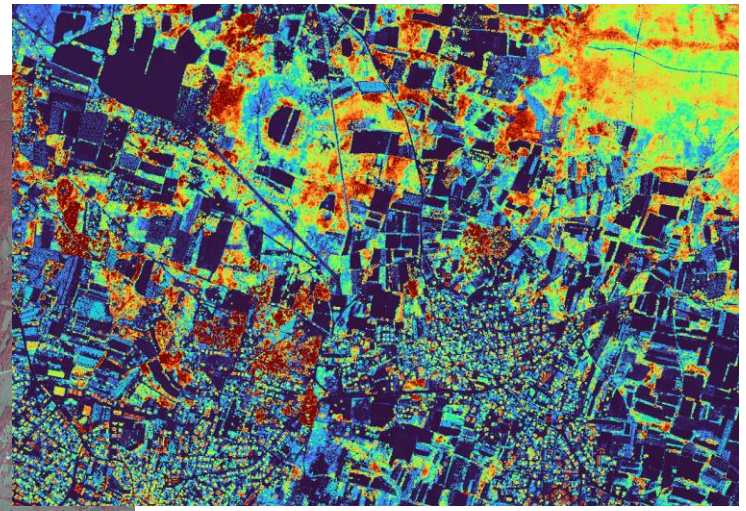
Sentinel-2



State orthophoto RGB

State orthophoto CIR





Lidar nDSM

- Land Cover Classification for historic years: GRID based

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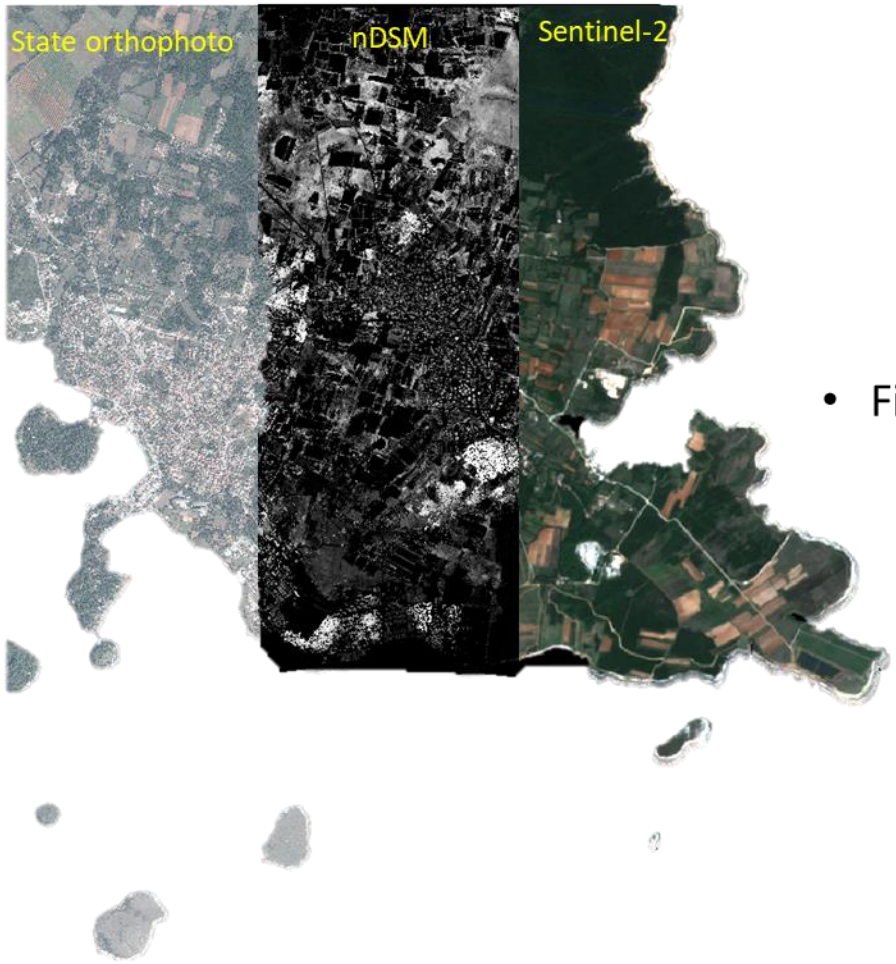
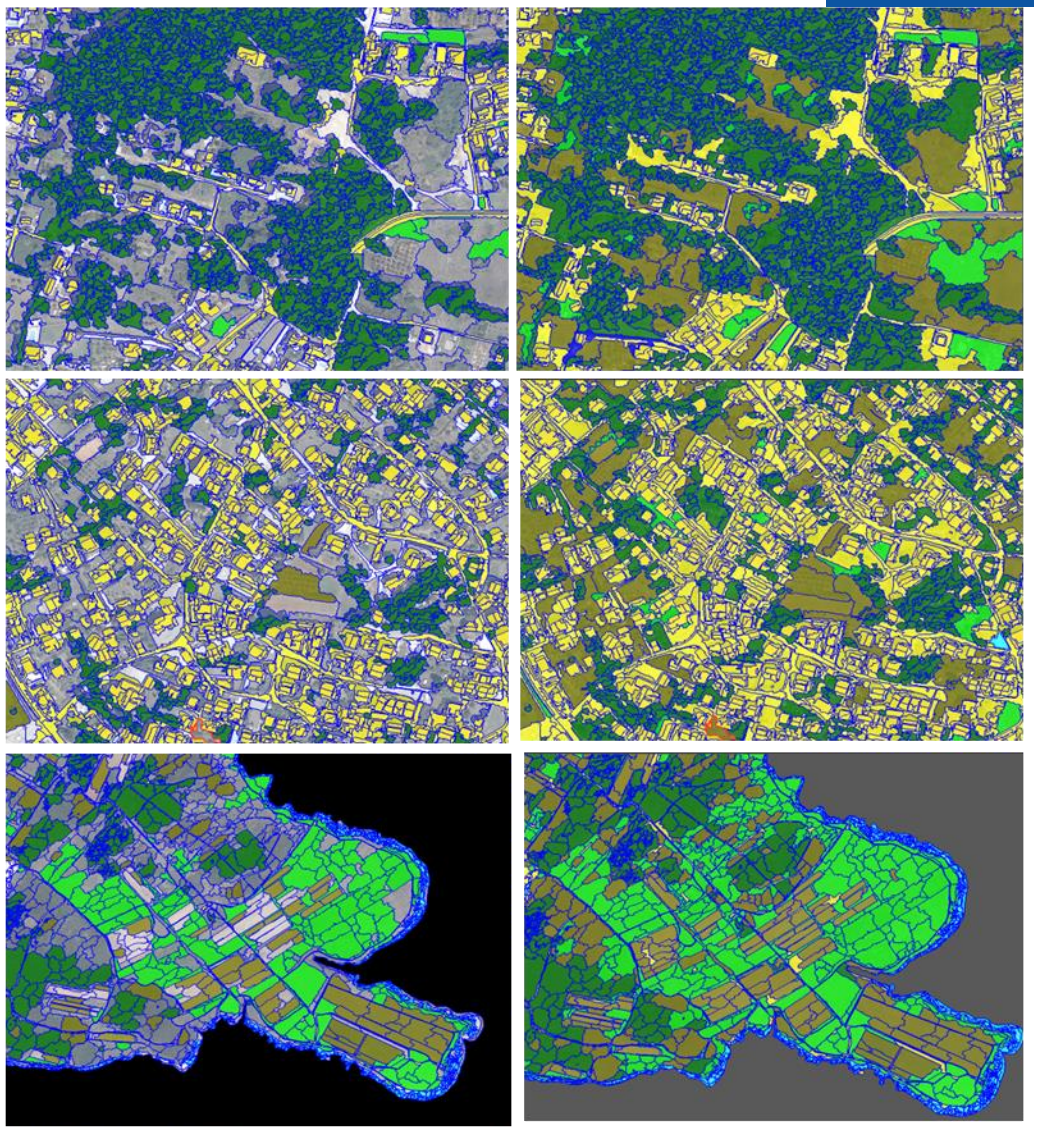
CROLIS Land Cover 2020 layer Classification (2)



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



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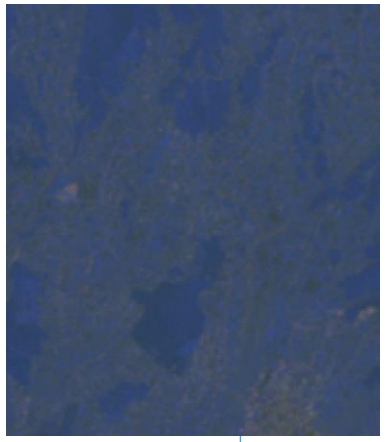
C 2 -Sources for historical period

1968.
Digital Orthophoto
- panchromatic
- resolution: 0.5 m

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



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

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

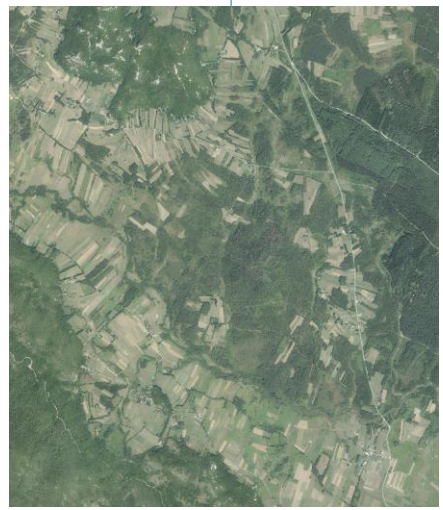
Landsat 5 TM
- 7 bands
- resolution: 30 m

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

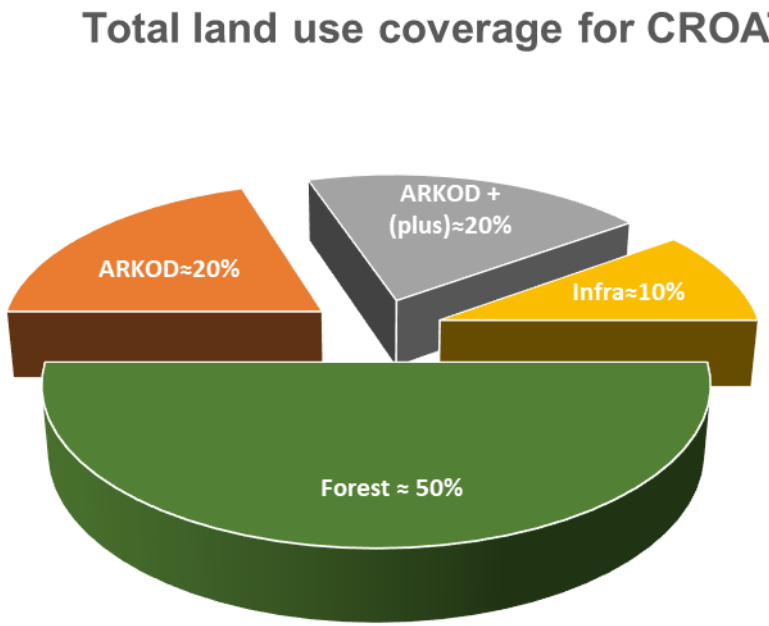
Landsat 5 TM
- 7 bands
- resolution: 30 m

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

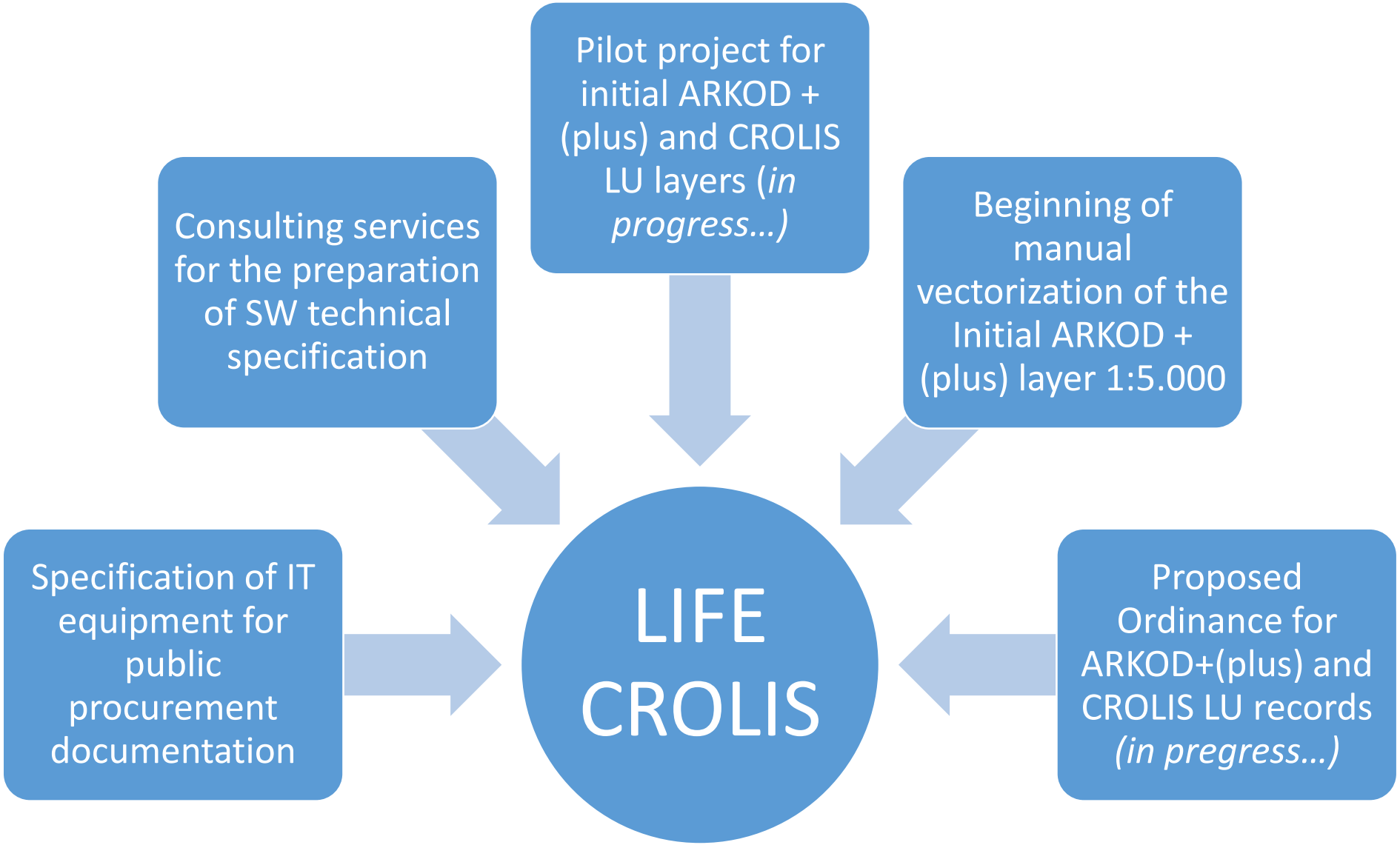
SPOT 5
- R, G, NIR
- resolution: 10 m



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

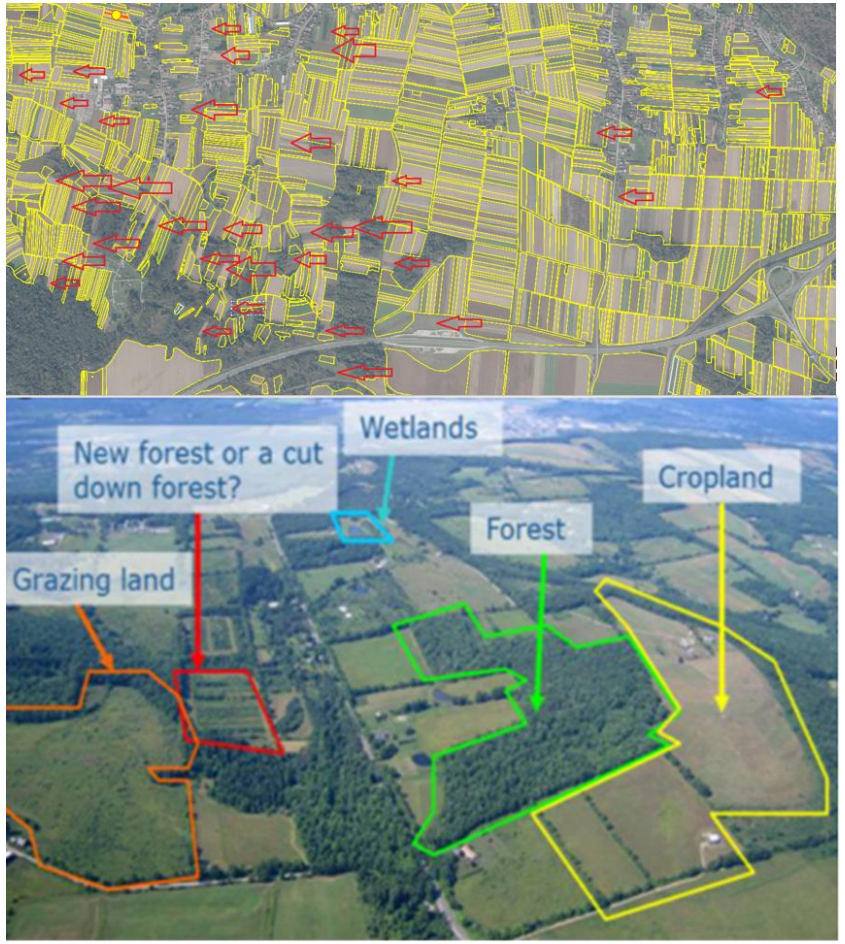


PAAFRD ACTIVITIES



PAAFRD ACTIVITIES

- 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+ establishmet – vectorization of agriculutre areas outside ARKOD
- CROLIS vector land use (VLU) establishment - harmonization of all vector data
- Spatial data quality control procedures (VLU)
- Solving spatial overlaps and filling gaps (VLU)



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BENEFITS from the 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,
- 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

Abended land and overlaps in forest and agriculture….

The main geospatial data provider are in the project and collaborate

Presentation to Parliament's Committee for Agriculture….

2/3 of interested responders use GIS data on daily basis…

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CROLIS project - Challenges

- Close to the closing date of the project, only partial results achieved - **EXTENSION NEEDED**
- Lack of a complete and unquestionable support to the project at a high decision-making level
  - **Continuous**
- Collaboration between partners institutions – very high at the medium management level in Associated beneficiaries' institutions
  - Needed: to secure a better understanding of the need for effective inclusion of climate issues in sectoral policies
- Green agenda in Croatia still does not recognise importance of LULUCF sector and its mitigation potential
- LULUCF is an interdisciplinary sector - national sectoral policies do not recognize this
  - Problems in achieving sectoral goals and securing needed financing
- In case of CROLIS failure, Croatia will have extreme difficulties to develop such a geographically explicit and harmonised land monitoring system that secures fulfilling obligations in line with the EU legislation
- LIFE program is a result oriented and provides all needed support

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Thank you

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