COUNTRY HOT TOPICS

GOFC-GOLD Network: SCERIN / MedRIN
Country: Slovenia
Team : Tatjana Veljanovski, Ana Potočnik Buhvald, Krištof Oštir

Remote Sensing priorities or 'hot topics':

- Permanent **grassland** monitoring – *projects for Nature conservation and Statistical office* [1, 2]:
    - no. of mowings, date of first mowing
    - intensity of use
    - presence of fertilization, renewing, grazing
    - grassland permanency (age) [3]
- **Forest** attributes – *national research projects*:
    - tree species classification [4]
    - forest stand phenology metrics
    - forest water balance cycle
- **EO data processing**:
    - SentinelHub by Planet Labs (Sinergise Ltd.)
    - 1-click ortorectification for VHR datasets
    - Sentinel-1/2, PlanetScope, WorldView, Landsat, MODIS
- **Lidar data visualisations** (RVT toolbox)
    - archaeology
    - Mesoamerican archaeology and archaeoastronomy

Joint Workshop of the GOFC-GOLD SCERIN and MedRIN Networks
CIHEAM conference center, Chania, Greece, July 16 – July 19, 2024
Land Cover Change (LCC) and Extreme Events in the Context of Climate Change

Mediterranean Agronomic Institute of Chania
Region of Crete
Eratosthenes Center of Excellence, Cyprus University of Technology
Aristotle University of Thessaloniki
NASA LCLUC Program
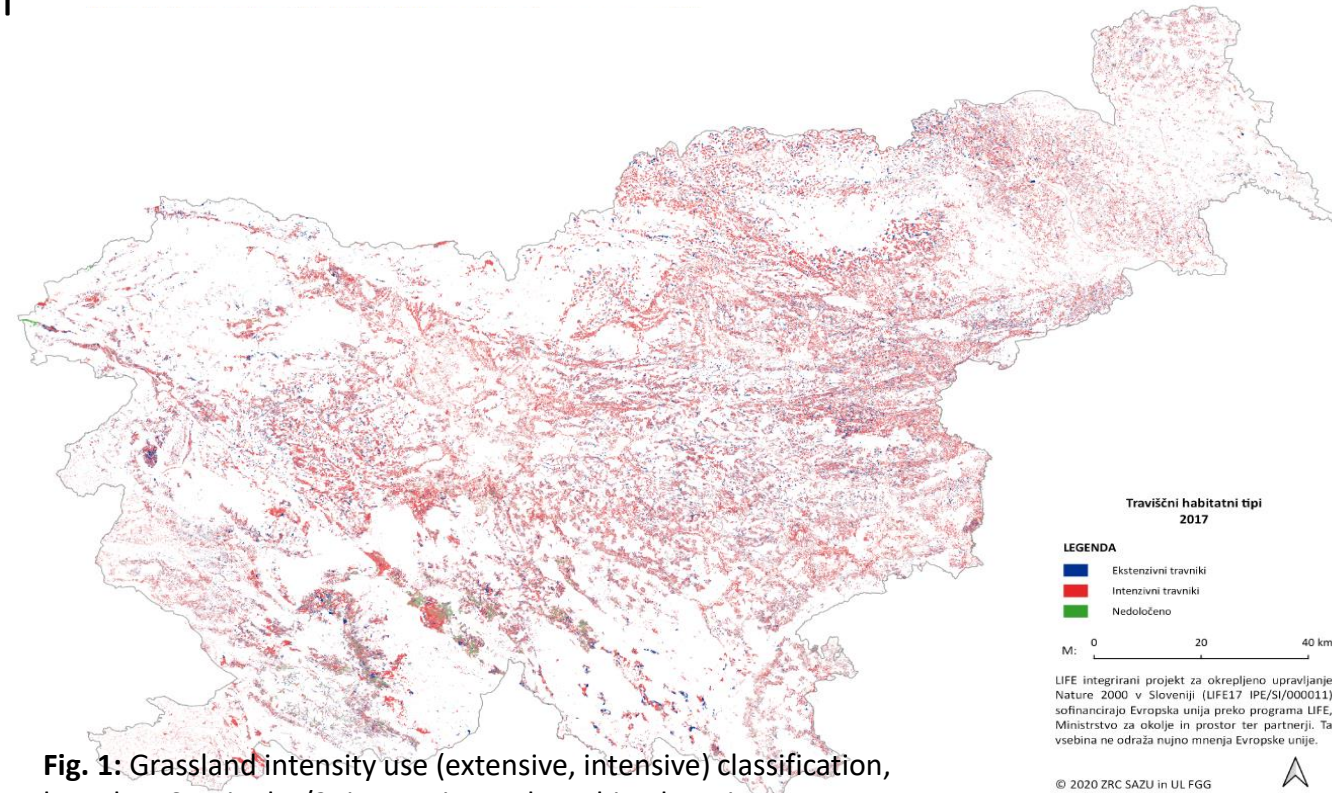GOFC-GOLD and START, USA

Fig. 1: Grassland intensity use (extensive, intensive) classification, based on Sentinel-1/2 time series and machine learning.
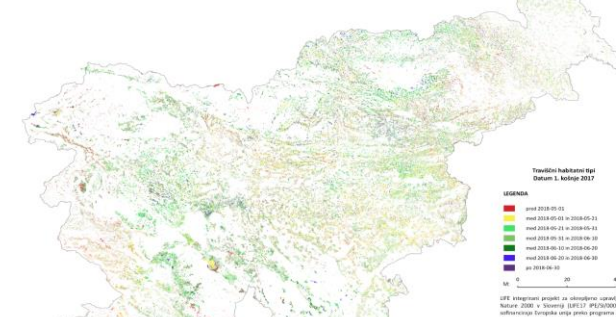

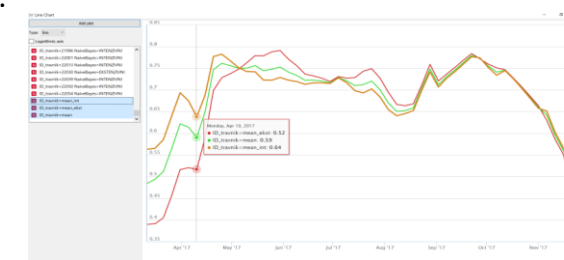Fig. 2: Date of first mowing changes by regions.

Fig. 3: There is a significant difference in the NDVI time series for intensive and extensive grassland, especially in spring.

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ACHIEVED

1. Project results:
- **two national research programs**: Anthropological and Spatial Studies + Earth Observation and Geoinformatics
- **Continuation of projects on grassland/forest/wetlands monitoring**, time series and machine learning:
ROVI – Inovative radar and optical satellite image time series fusion and processing for monitoring the natural environment (2021-2024)
→ development of radar-optical vegetation index
SURS GEOS - Development of system for usage of remote sensing data (incl. feasibility study) – case study to monitor agricultural land (permanent grassland and soil wetness) (2021-2023)
→ age of grassland (Landsat5/8 and Sentinel-2)
→ improved frameworks for mowing detection
ZRSVN - Feasibility study and mapping of grassland habitat types with remote sensing with emphasis on separation of intensive and extensive grasslands (2019-2020)
→ intensity use of grassland

2. Development of new Toolboxes:
AiTLAS - Artificial Intelligence toolbox for Earth Observation [5]
RVT toolbox – Relief Visualisation Toolbox [6]

3. Across disciplines – remote sensing and anthropology:
Contextualization of EO data for a deeper understanding of river environment changes in Southeast Europe (2020-2022)
Experiencing water environments and environmental changes: An anthropological study of water in Albania, Serbia and Slovenia (2019-2022)

4. Geographical dimension
Slovenia, Serbia, Bosnia and Hercegovina, Albania, the Carphatians, UK, Ireland, Africa, Jucatan-Mexico

5. Networking opportunities:
Joint research project Slovenia-Czech Republic (ARIS-GAČR) & SCERIN colleauges (RO, SK) helped with data sharing

6. Currently trending:
STONE: "Unde venis?" Unravelling the enigma of the stećci tombstones (2024-2029), ERC grant
Land of stećci: multiculturality in the medieval Herzegovina…

NEAR FUTURE PLANS

1. Delineation of **habitat types** on extensive **grasslands**
2. **Forest response observation** accross large geographical gradients (Carpathians, Dinaric mountain range)
3. Deepen monitoring capabilities of **grassland parameters**
4. Research activities on **forest water balance cycle** (integration of field and satellite measurements of soil/canopy water content)

Main objectives:
- implement VHR time series data (PlanetScope) into the procedures

NETWORKING OPPORTUNITIES:
- open to **collaboration**, exchange visits and
- to **promote data sharing** within a GOFC-GOLD RIN or between MedRIN and SCERIN

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References

[1] Grassland Use Intensity Classification Using Intra-Annual Sentinel-1 and -2 Time Series and Environmental Variables.
https://www.mdpi.com/2072-4292/14/14/3387

[2] Sustainability of grasslands: Determining the age of grassland with time series from Sentinel-2 and Landsat-5/8 imagery. – *in preparation*

[3] and [4]: see SCERIN-MedRIN agenda day 4

[5] AiTLAS - Artificial Intelligence Toolbox for Earth Observation. https://aitlas.readthedocs.io/en/latest/#

[6] Relief Visualization Toolbox (RVT). https://www.zrc-sazu.si/en/rvt

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