MAIN RESULTS AND FUTURE PERSPECTIVE FOR SRTI-BAS ON FPCUP ACTIONS

European Commission

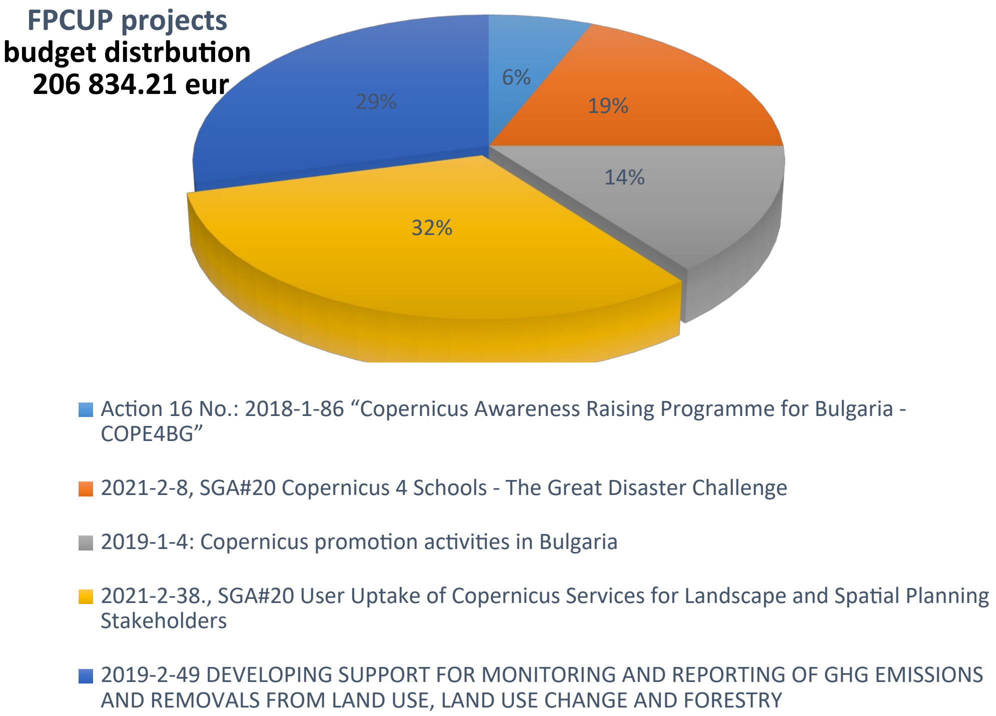
Copernicus
Framework Partnership Agreement for Copernicus User Uptake

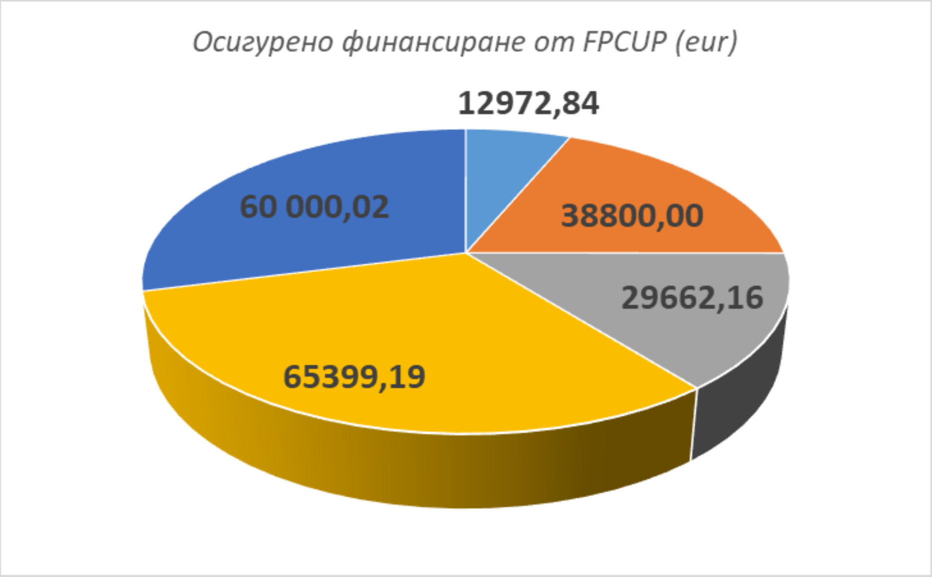
БАН ИКИТ

Prof. Lachezar Filchev, Dr. Kamelia Radeva

FPCUP ACTIONS 2019 - 2025

Action No.		Name of action	Type of action	Period
Project 1	2018-1-86	Copernicus Awareness Raising Program for Bulgaria - COPE4BG	Building an active user dialogue	2019-2022
Project 2	2019-2-49	Developing support for monitoring and reporting of GHG emissions and removals from land use, land use change and forestry	National and multi-national information/training events	2019-2022
Project 3	2019-1-40	Copernicus Promotion Activities in Bulgaria	National and multi-national information/training events	2020-2022
Project 4	2021-2-38	User Uptake of Copernicus Services for Landscape and Spatial Planning Stakeholders	Developing and piloting downstream applications and services	2022-2025
Project 5	2021-2-8	Copernicus4Schools – The Great Disaster Challenge	National and multi-national information/training events	2022-2025





SGA №	FPCUP проекти	Стойност евро	% разпределение	Стойност лева	Експерти	Научни статии	Ръководство/Сборник
SGA#06	2018-1-86.Copernicus Awareness Raising Programme for Bulgaria - COPE4BG”	**12972,84**	**6,27**	25372,67	7	4	1
SGA#20	2021-2-8.Copernicus 4 Schools - The Great Disaster Challenge	**38800,00**	**18,76**	75886,21	8	1	2
SGA#10	2019-1-4.Copernicus promotion activities in Bulgaria	**29662,16**	**14,34**	58014,13	8	4	1
SGA#20	2021-2-38. User Uptake of Copernicus Services for Landscape and Spatial Planning Stakeholders	**65399,19**	**31,62**	127909,70	6	3	
SGA#20	2019-2-49.Developing support for monitoring GHG emissions and removals from land use, land use change and forestry	**60 000,02**	**29,01**	117349,85	10	3+2	1
		206834,21		**404532,56**	39	17	5

2018 **First National Copernicus Workshop**

Inaugural event launching Bulgarian Copernicus activities

2020 **II-nd Workshop (International Participation)**

European collaboration and knowledge exchange

2022 **National Copernicus Seminar**

Advanced applications and user community growth

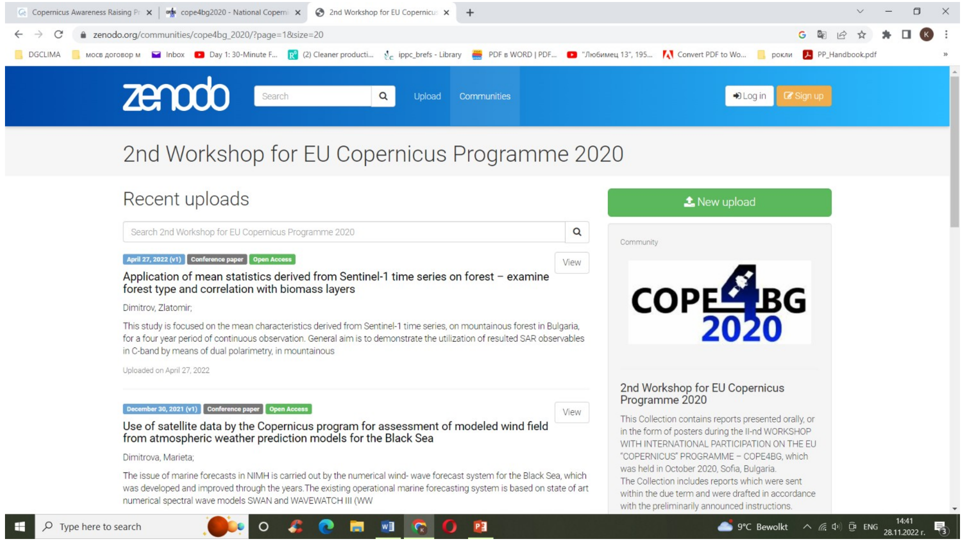
2024 **Continued Engagement Activities**

Ongoing capacity building and training programs

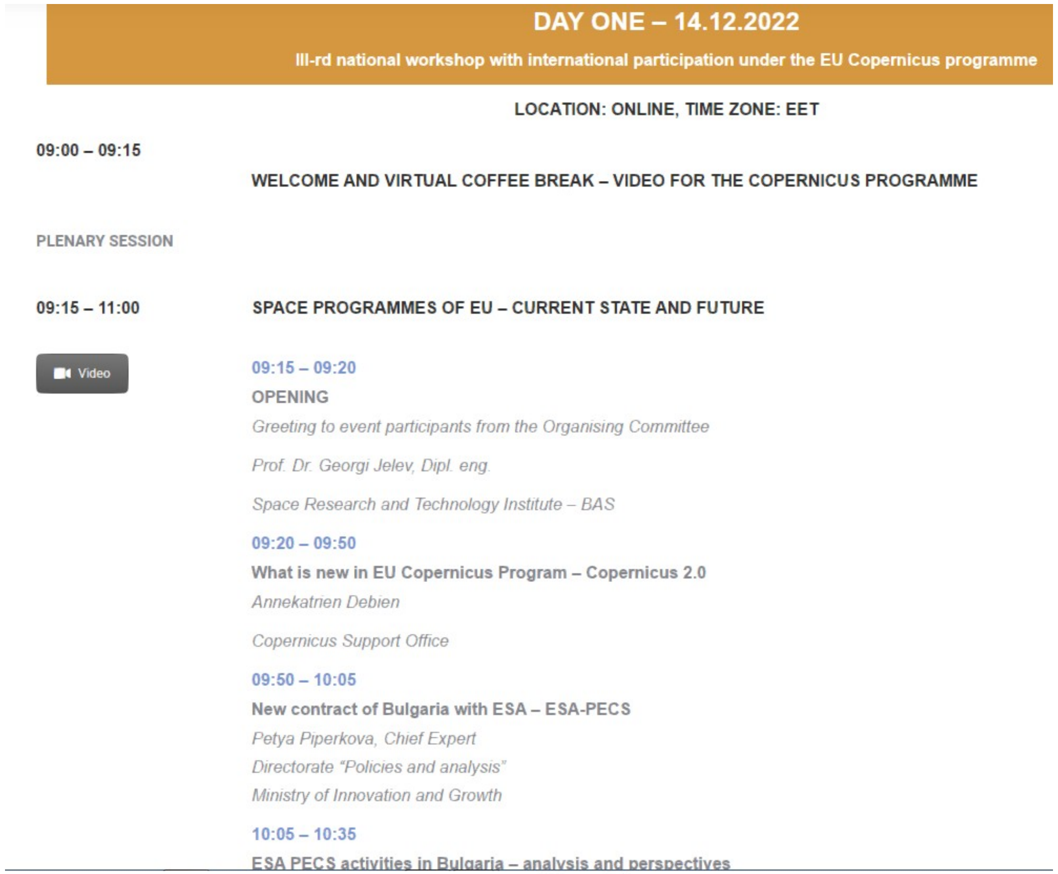
RESULTS

MAIN ACTIVITIES

1. **raise awareness and knowledge of research/academic community and governmental institutions on Copernicus/EO and its data, products, and services- participation/contribution of governmental agencies, research institutions (academia) and business in EU EO/Copernicus related**
2. **Develop demonstration use cases for national governmental/non-governmental or business entities;**
3. **Initiate a national EO/Copernicus Coordinating Committee;**
4. **Provide for networking opportunities with other Copernicus Relays/Academies**



- **Monthly Copernicus Newsletter, prepared jointly by the Copernicus Relays with the support of Copernicus Academy**
- **Use-cases for Bulgarian governmental/non-governmental and business entities;**
- **A Workshop, organized collaboratively by the Ministry of Economy and other public bodies. Workshop proceeding;**
- **Presentations at scientific conferences, governmental forums, meetings, etc.;**
- **Design of a National Copernicus Relays and Academy web-portal;**



Past Events

I-st National Workshop with international participation under the EU Copernicus programme – 2018

II-nd National Workshop with international participation under the EU Copernicus programme – 2020

18 presentations in Day 1 – Information session
11 presentations in Day 2 – Conference Session
2 training sessions with presentations of EarthBlox, CREODIAS, WEkEO, and Eclipse (Telespazio)

Copernicus Academy&Relays Bulgaria – web-portal

- The concept and creation of the web portal is implemented by the representatives of Copernicus Academy and Relays Bulgaria through the support from FPCUP Actions

https://copernicus.bg/

Copernicus User Uptake Representatives Portal – Copernicus Academy & Relays for Bulgaria – targeting the Bulgarian stakeholders

- A place to access detailed and up-to-date information on the Copernicus programme in Bulgarian, Bulgarian use-cases and discussion forum
- The web-portal will be completed by mid-2023.

Project: Action 2019-2-49. DEVELOPING SUPPORT FOR MONITORING AND REPORTING OF GHG EMISSIONS AND REMOVALS FROM LAND USE, LAND USE CHANGE AND FORESTRY

MAIN ACTIVITIES

- **Technical needs for meeting technical requirements of reporting Green House Gases (GHG) emissions and sequestration and LULUCF**
- **Data integration, including needs for time series consistency, data transformations and gap filling**
- **Elaboration of 10 Maps of LULUCF for selected region**
- **National-level meeting and training for implementation of Copernicus data and products for monitoring LULUCF with a view to GHG emissions and removals from LULUCF**

❖ **Integrated Land Use Data Monitoring & Reporting System (Synchronization of Cadaster, Forestry data, Agricultural parcels data)**

❖ **Enhanced earth observation capabilities**

❖ **Policy & legislation changes (INTEGRATE Copernicus data and other National datasets)**

NATIONAL INVENTORY REPORT
GREENHOUSE GAS EMISSIONS IN BULGARIA
CHALLENGES

Resources and expertise:

❖ Lack of human and financial resources in the institutions responsible for reporting of GHGI

❖ Lack of expertise within the LULUCF team for processing of remote sensing and geo-spatial information for development of land-use change matrices

Technical challenges:

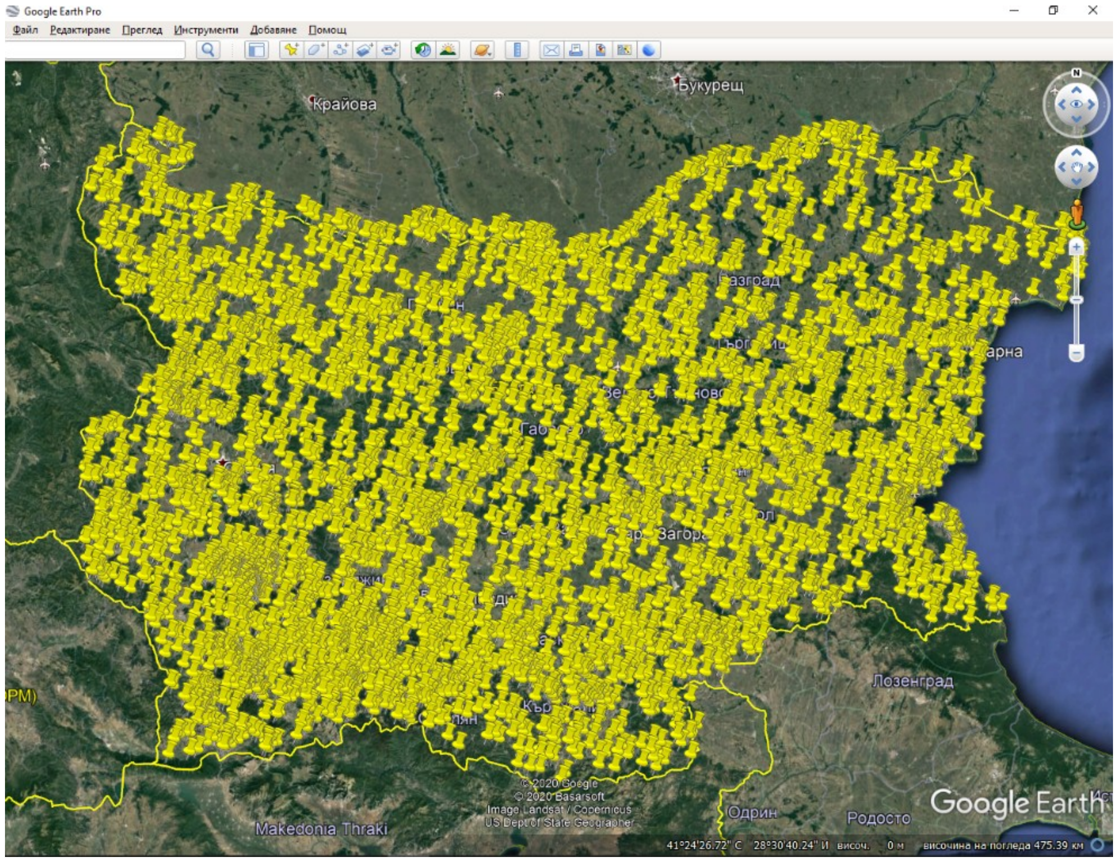
❖ Different temporal coverage of the spatially explicit data available in the country.

❖ Difficulties to construct a complete and consistent time series

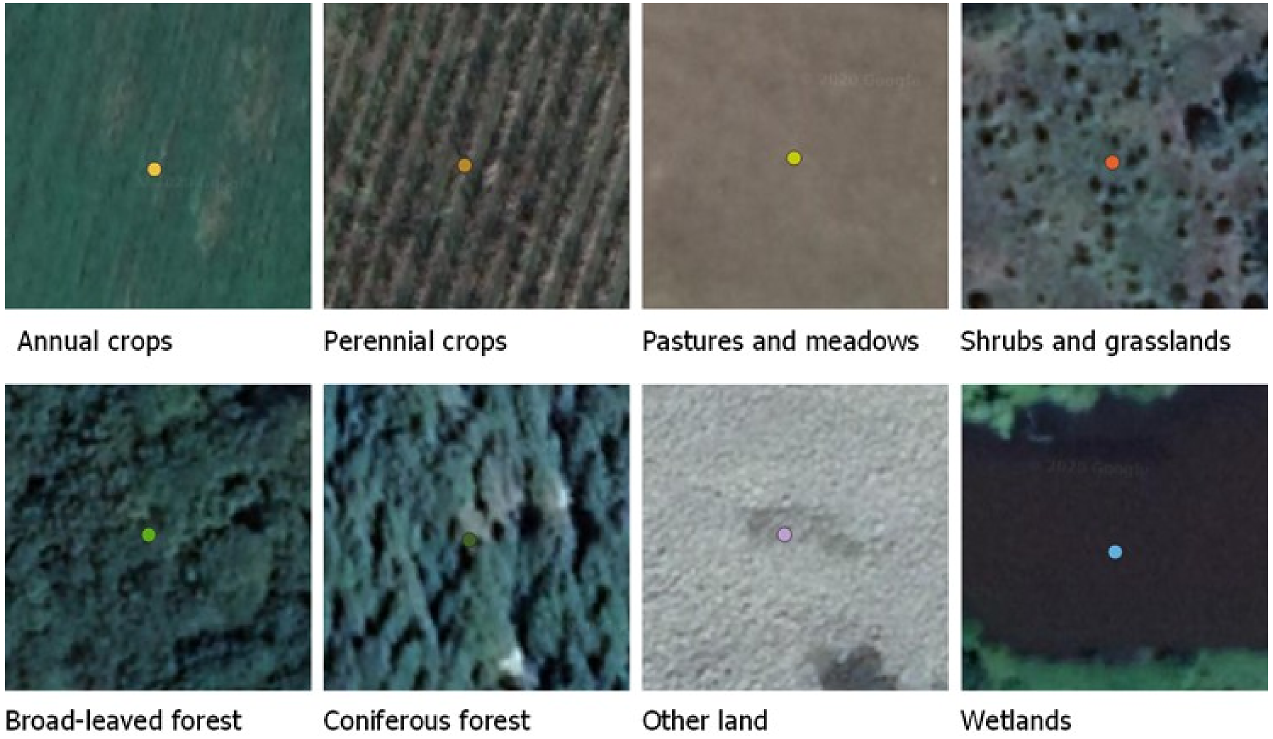
❖ Different spatially explicit datasets challenge the processing, harmonization and validation of the data

❖ Uncertainty about the need of manually enhancing and processing of the data when aggregate different data sources (i.e LPIS, CLMS, FMPs etc).

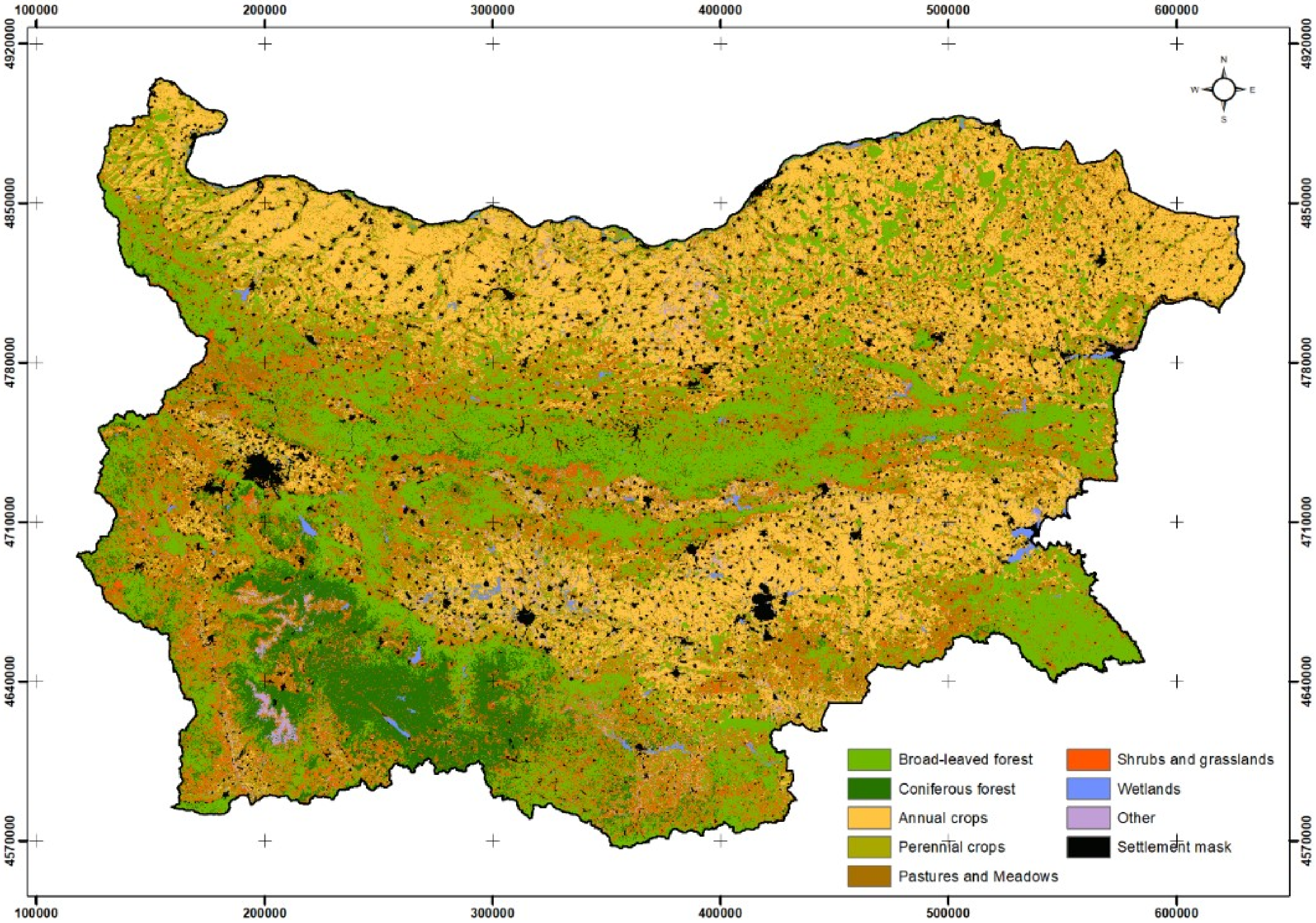
44 000 (500 points x 8 classes x 11 years) to only **4 000** points



70% - the training classifier and 30% - classification validation



Overall accuracy = 79.9 ± 2.8



Land cover map of Bulgaria for 2022 derived from Sentinel-1 and Sentinel-2 imagery.

MEETING TECHNICAL NEEDS

NO COPERNICUS DATA FOR HISTORICAL PERIODS TO SUPPORT LAND USE MAPPING AND CONSTRUCTING CHANGE MATRICES

- Transitional periods of 20 years before the corresponding reporting year (this may go back as far as 1968

SENTINEL-DERIVED LAND COVER INFORMATION MAY NOT BE SUFFICIENT TO DETERMINE ACTUAL LAND-USE

- Integrated use of satellite data and other existing datasets (Cadaster, Forestry data, Agricultural parcels data)
- Change in the land-use category definitions to facilitate the integration of satellite-derived information (e.g. city green spaces may be excluded from the “Settlement” land-use category)

SPECIES RELATED AREA INFORMATION IS NOT AVAILABLE FROM COPERNIDUS DATA

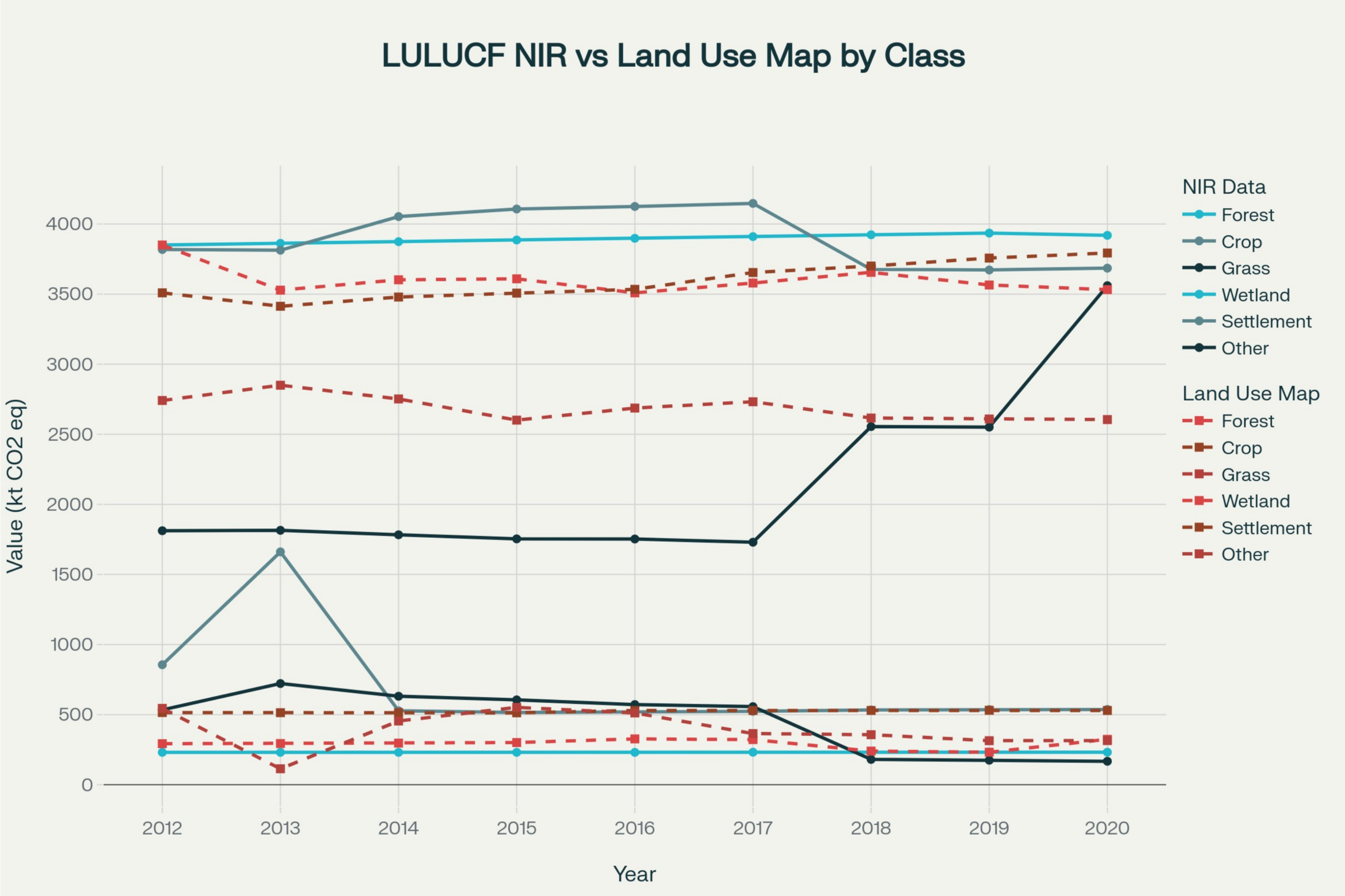
- Current national procedures calculate emissions/removals in forests using tree species-specific conversion factors

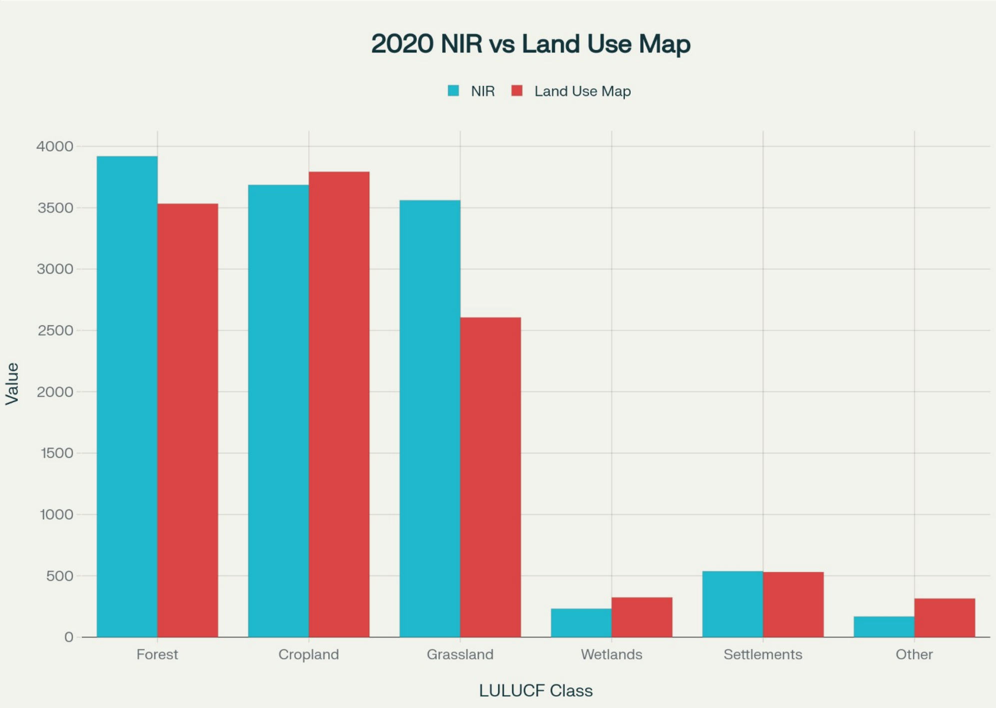
DIFFICULTIES DERIVING COPERNICUS DATA FOR LAND-USE CLASSIFICATION SUB-CATEGORIES

- Integrated use of satellite data and other existing datasets

FPCUP SEMINAR
19-20 April,2023
Bonn, Germany

“Area” Data Comparison for LULUCF classes (kha) based on
National Inventory Report (NIR) and Remote sensing data(Land use map)





Fundamental equation

Emission/removal (t CO2eq)=**Area (ha)*** Emission factor (t C/ha)*(-44/12)

Conclusions

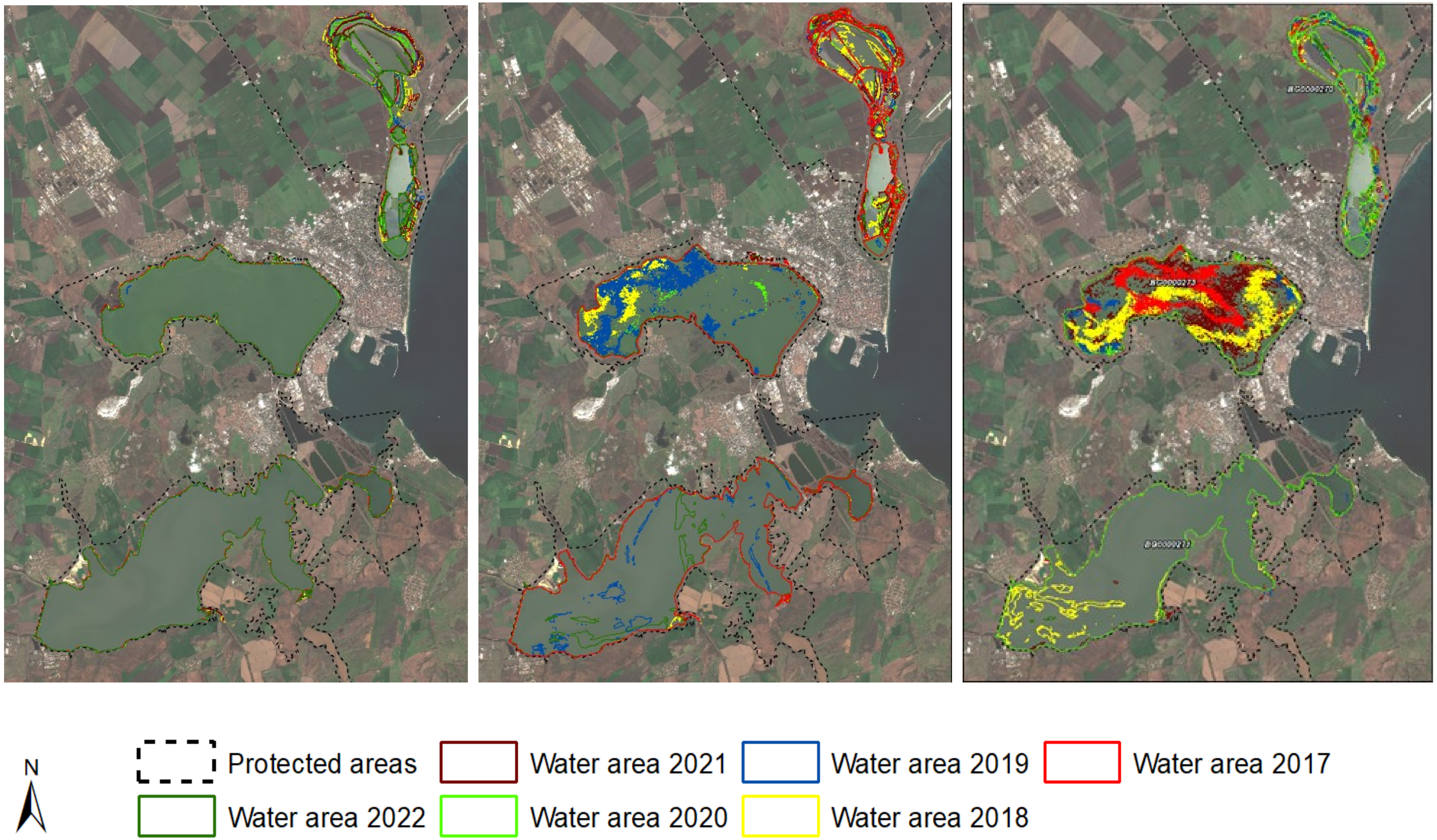
1. **COPERNICUS PRODUCTS/ SERVICES** will ensure proper and reliable data on land representation and LUCs;

AREA OF LULUCF CATEGORIES
CHANGES FROM ONE TO ANOTHER LULUCF CATEGORIES

2. THE NEED OF APPLYING **COPERNICUS PRODUCTS/ SERVICES** WILL **BOOST THE SYNCHRONIZATION** between different information systems that provide data for the need of Bulgarian GHG Inventory Report

3. COPERNICUS PRODUCTS/ SERVICES could serve as **Verification tool** (neutralize the assumptions regarding the land use changes and to double check some of the information regarding specific classes of land use)

4. Future procedure should INTEGRATE **Copernicus** data and **other National** datasets. The procedure may include a wall-to-wall land-use mapping for a base year. - Switch to Approach 3 for land-use area representation



- Left image: with an increase in precipitation, a change in the water areas for April, which has a pronounced maximum of precipitation in
- the spring <u>no significant change</u>
- Middle image: with the decrease of precipitation in August, which has a pronounced minimum of precipitation in summer, <u>significant change</u>.
- Right image: <u>change i</u>n the water areas with a pronounced winter max, of precipitation, due to the **fallen precipitation from snow**.
- **CLIMATE CHANGE INFLUENCE ON WETLANDS**

BENEFITS

1. Obtain PROPER and RELIABLE DATA on land representation and LUCs;
2. Overcome DATA GAPS: LUCs track between categories/subcategories
3. Reduce using “ASSUMPTIONS”

“……… the remaining LUC areas to forests have been assumed to stem from cropland, grassland and other lands. The assessment of the former land use on the identified new forest areas is based on expert judgment on basis of likelihoods….”

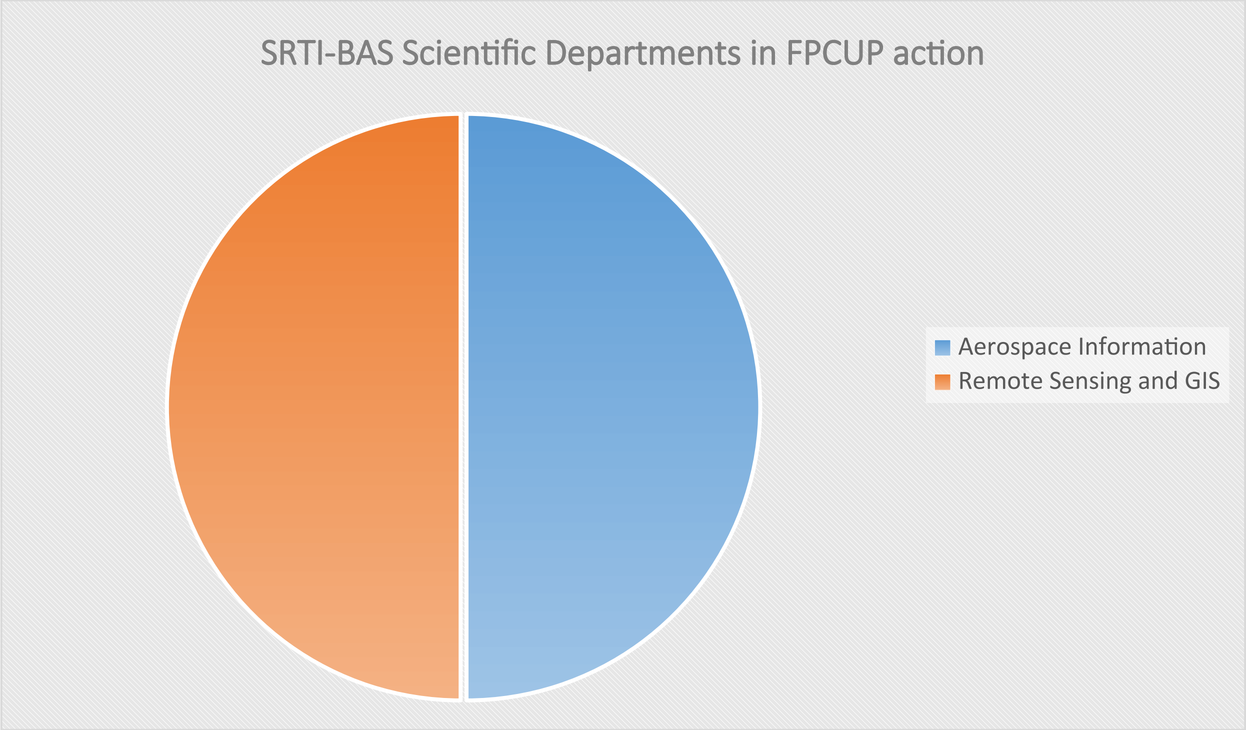
4. Use maps based on Remote Sensing in GHGI report 2019

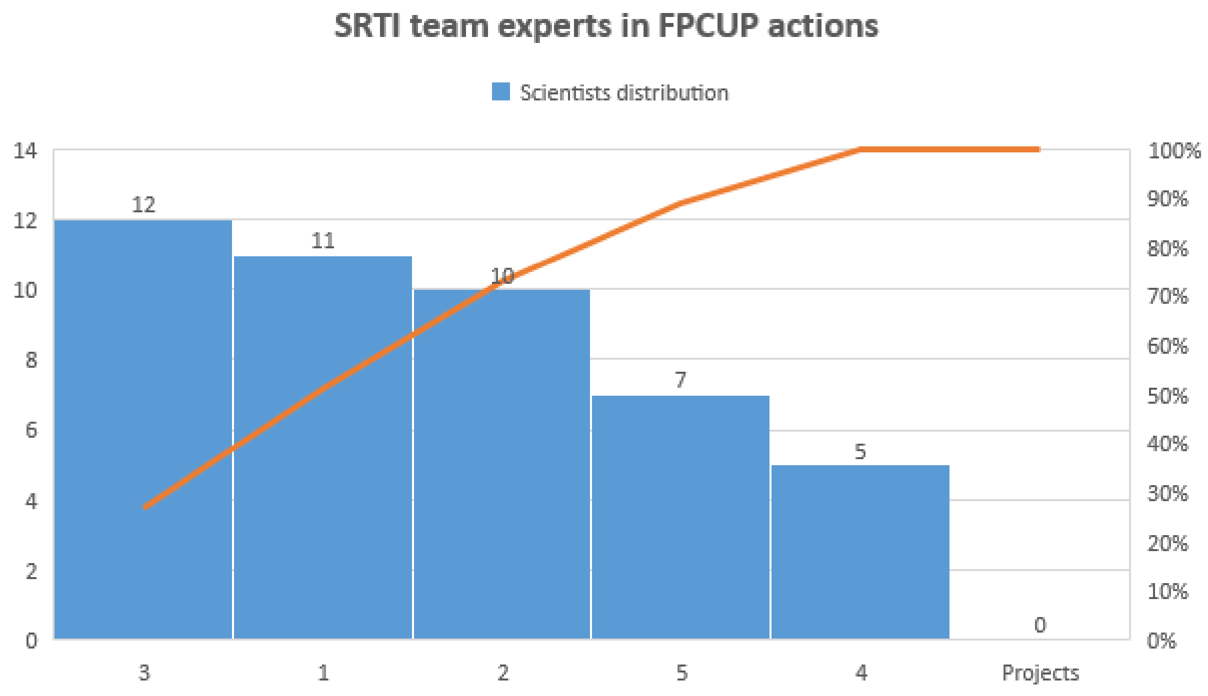
CHANGE ⟶ PRESSURE ⟶ HIGHER TIERS

Waiting#BigChange

FUTURE PERSPECTIVE

SRTI-BAS scientists involved in FPCUP projects





20 Experts to be involved in FPCUP projects

FPCUP projects - Scientific incentive

FPCUP actions – Remote sensing application, Copernicus services and products awareness, technical expertise and Legislation changes

THANK YOU!

River Ropotamo Estuary

SRTI-BAS Project Coordinators for FPCUP actions:

Kameliya Radeva

Lachezar Filchev

E-mails: spacedgclima@gmail.com

www.copernicus-user-uptake.eu