



MAIL Newsletter 3

Editorial —

Dear friends and colleagues,

Welcome to the new issue of the MAIL (Identifying Marginal Lands in Europe and strengthening their contribution in a CO₂ sequestration strategy, GA No. 823805, H202-MSCA-RISE-2018) project newsletter. MAIL is a cooperation European project funded by the Research Executive Agency (REA). This is the third of a total of six newsletters over the course of the MAIL project. The 3rd issue presents a brief outline of the progress that has been achieved over the previous period and provides information about the successful implementation of the Midterm Review Meeting.

Since the official start of the MAIL project almost two years ago, there have been significant advances in the development of the methodology for the identification of marginal lands. All the relative datasets have been collected and used for the creation of a GIS that will be used to identify marginal lands in European level. The workflows have been finalized, while the model is currently fine-tuned. In addition, the evaluation and the accuracy assessment of the developed methodology is currently underway. The evaluation of Carbon sequestration and biomass estimation has successfully been implemented.

During the period, a total of 24 secondments adding to approximately 60 person months have been implemented.

I believe that this brief review of technical progress included in our 2nd newsletter, is a good opportunity for us to present our activities and results, exchange information with you and create awareness in management and usage of marginal land as potential carbon stocks. Please do not hesitate to send your suggestions on this publication as well as on project activities.

Petros PATIAS

MAIL Coordinator

Director of AUTH's Laboratory
of Photogrammetry and Remote Sensing

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— The MAIL project —

The global climate change is a worldwide problem where its mitigation is one of the 17th Sustainable Development Goals of the UN. An effective mitigation strategy should assess all the possible sustainable actions that can contribute to this direction. A challenging and very prominent contribution to raise CO₂ sequestration could come from the Land Use Land Use Change and Forestry sector (LULUCF sector) and the utilization of Marginal Lands (MLs) that today are widely available in the EU. MLs can play significant role as potential Carbon Sinks. Especially those on mountainous and semi-mountainous areas (m/sm MLs) are of great capacity and can contribute actively to that goal having no effect in the agri-food production sector. Even though MLs' contribution is acknowledged the influence of their active inclusion in the climate change mitigation strategies has not yet been estimated in depth.

MAIL focuses on m/sm MLs in order to classify them into Carbon sequestration capacity categories based on innovative approaches fully consistent with the IPCC methods and the UNFCCC requirements. The final goal is to deliver a methodology and application set in a web-based platform format, which will be valuable for policy makers, stakeholders or researchers. Free open access data of other EU initiatives will be combined, (land cover, soil, topography, climate, etc.) in order to detect the potential existence of m/sm MLs. These, will be further examined, validated and classified in Carbon sequestration capacity groups through stratified field sampling. State of the art remote sensing (RS) techniques and free open access satellite images with improved spatial and radiometric resolution will be used in order to augment the accuracy of the produced pilot thematic maps. In addition, actions that have to be taken in order to increase the Carbon sequestration capacity will be proposed, while their feasibility will be assessed. A final methodology will be delivered for on-demand production of thematic maps within Europe.





Midterm review meeting

The MAIL midterm review meeting was successfully realized on September 24 by teleconference. The purpose of the meeting was to assess the general advancement of the project, to identify issues related to the project implementation, to find the relevant solutions and to realize a meeting between the Project Officer and the researchers seconded in the project. The consortium had the opportunity to present to the Project Officer the progress achieved in the project. All the work performed was presented in detail during the one full day meeting. The Work Package Leaders presented the work achieved in each work package and the implementation plan for the remaining lifetime of the project. Furthermore, the Project officer had the opportunity to meet with the secondees and learn about their secondment experience.

Finally, the consortium had a very constructive interaction with Project Officer discussing and solving issues related to the implementation of the project mostly focused on the barriers imposed by the COVID-19 pandemic.

A total of 15 consortium members attended the midterm review meeting, while all the secondees met with the Project Officer.



Secondments

1. Ms. Maria Tassopoulou (AUTH) finished her secondment to IABG working on Task 2.3
2. Mr. Anastasios Starnas (AUTH) finished his secondment to IABG working on Task 2.4
3. Mr. Lampros Papalampros (HOMEOTECH) successfully finished his secondment to CBK PAN working on Task 2.5
4. Ms. Eleni Loukaki Gkountara (HOMEOTECH) successfully finished her secondment to CBK PAN working on Task 2.5
5. Mr. Simonas Garsva (IABG) successfully finished his secondment to CBK PAN working on Task 2.6
6. Mr. Reawanth Ravindran (IABG) successfully finished his secondment to AUTH working on Task 2.6

7. Mr. Jesus Torralba Perez (UPV) successfully finished his secondment to IABG working on Task 2.6
8. Mr. Michał Krupiński (CBK PAN) successfully finished his secondment to IABG working on Task 2.3
9. Ms. Ewa Gromny (CBK PAN) successfully finished her secondment to IABG working on Task 2.3
10. Mr. Sebastian Aleksandrowicz (CBK PAN) successfully finished his secondment to IABG working on Task 2.3
11. Mr. Juan Pedro Carbonell Ribera (UPV) successfully finished his secondment to HOMEOTECH working on Task 2.9
12. Mr. Juan Pedro Carbonell Ribera (UPV) successfully finished his secondment to HOMEOTECH working on Task 5.4



I am Maria Tassopoulou, MSc. Surveyor Engineer. I am a PhD Student, and an early stage researcher in the laboratory of Photogrammetry and Remote Sensing of the School of Surveying Engineering of the Aristotle University of Thessaloniki – Greece. My areas of expertise include photogrammetry, remote sensing, GIS,

3D modelling, and cartography. My working experience includes the collaboration with several surveying and architecture firms in Thessaloniki and Athens, and I was previously Head of the Spatial Data Process Dept. of Aerophoto Co Ltd, responsible for the project coordination and processing of Spatial Data (i.e. VHR Aerial and Satellite images) using specialized Photogrammetric, Remote Sensing and 3D modelling data processing (2014-2016).

My secondment for the MAIL project, at IABG Geodata Factory in Dresden - Germany, was realized from January 1st – June 30th, 2020. During my secondment I worked on Task 2.3 “Methodology development of m/sm MLs detection” under WP2 of the project, focusing on the development of the methodology for identifying marginal lands. My work included the refinement of the proposed methodology, its implementation to different test sites around Europe, and the automation of this procedure. Indicative outcomes of my work included detailed workflows and new refined sets of indicators for identifying Marginal Lands.

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MAIL - Identifying Marginal Lands in Europe and strengthening their contribution potentialities in a CO2 sequestration strategy

MAIL project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 823805; [H2020 MSCA RISE 2018]



Anastasios Stamnas obtained a Diploma in School of Rural and Surveying Engineering (AUTH) (2003), a Diploma in School of Architectural Engineering (DUTH) (2011), a M.Sc. in Protection, Preservation, and Restoration of Cultural Monuments (AUTH) (2006), a PhD From Faculty of Engineering, School of Rural and Surveying Engineering (AUTH) (2013). Since 2019, he is a postdoctoral researcher in School of Rural and Surveying Engineering (AUTH). His research activities include Photogrammetry, Remote Sensing, Geographic Information Systems, Laser Scanning and 3D Modelling.

During his secondment in IABG Geodata Factory, located at Dresden, Germany from July 1st until September 31st, 2020, worked on Package 2.4. "Accuracy assessment of m/sm MLs detection". The main tasks of this Working Package were the accuracy assessment of Marginal Lands detection/classification and the definition of the statistical methods and limits that are going to be used for the accuracy assessment. His work comprised of the essential literature review, the description of testing sites and datasets, the description of methodology and the results (error matrices and derived indices).

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My name is Lampros Papalampros. I am from Thessaloniki (Greece) and I work in HOMEOTECH since 2007. I am a graduate of the Department of Forestry and Natural Environment of the Aristotle University of Thessaloniki (AUTH) (2006). I have substantial experience in scientific areas such as forest management, cadastre, research programs, LIFE programs, environmental subjects, etc., as I am professionally active since 2004. I have acquired an M.Sc. degree in "photogrammetric production and remote sensing management in GIS environment" (2013) from the School of Rural and Surveying Engineering (School R&SE/AUTH). Since 2013, I am studying towards a Ph.D. in the area of Geodesy and Surveying (School R&SE/AUTH), in the field of 3D capturing and monitoring of natural environments through novel technologies.

I seconded to the Earth Observation Department of the Space Research Center of the Polish Academy of Sciences in Warsaw in January 2020 for 1 month in total. I worked on task 2.5 "Existing models customization-evaluation-validation, considering local aspects" of the MAIL project under the supervision of Professor Edyta Woźniak. The task has to do with existing models of carbon stock estimation and their evaluation and validation considering local aspects. The first part of the task was implemented at Cesefor and had to do with the literature review. During my secondment I proceeded by analysing EO data. Specifically, land marginality was examined based on Corine Land Cover inventories of 2000, 2006, 2012 and 2018 in order to analyse marginality trend for whole Europe.

[Watch video](#)



My name is Elena Loukaki and I am a forester. I graduated from the Aristotle University of Thessaloniki in 2013 and I hold a master's degree in management of Water Resources and a master

degree in Wildlife Management.

I work in HOMEOTECH since 2013. During this period, I have worked in several projects related to management of protected areas, forest cadastre, forest management, climate change adaptation and mitigation and invasive alien species management.

My secondment in the Earth Observation department of Space Research Centre of the Polish Academy of Sciences in Warsaw was planned from the 10th of February till the 8th of April. Due to COVID-19 pandemic, I came back to Greece on the 12th of March and I continue my task through teleworking. My involvement in the project was on the task 2.5 "Existing models customization – evaluation – validation considering local aspects." During my secondment I worked on Net Primary Production analysis in order to gain valuable information about carbon sequestration trend around Europe. The analysis was performed in terms of species, marginality categories and environmental conditions.

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My name is Simonas Garsva and I am a satellite data engineer/scientist from Lithuania. In 2020 I worked on MAIL project at IABG in Dresden, Germany as a master's student fulfilling my study programme "ESPACE – Earth Oriented Space Science

and Technology" at the Technical University of Munich (TUM). In particular, I focus on remote sensing application development using synthetic aperture radar (SAR) data.

During my secondment at the Space Research Centre of PAS (CBK PAN) in Warsaw, Poland in the summer of 2020, I was working on task 2.6 "Estimation of biomass volume at low productivity MLs". The primary goal of my work was to investigate the suitability of European Space Agency's (ESA) Sentinel-1 satellite data for biomass estimation in marginal lands. To do so, I employed three different methods using Sentinel-1's backscatter intensity, interferometric coherence and combined data, and applied them on the selected study sites in Europe.

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My name is Rewanth Ravindran, and I work at IABG as a master thesis student. I have experience working on remote sensing applications using synthetic aperture radar (SAR),

and multi-sensor fusion datasets.

At IABG I primarily work on the MAIL Project to estimate biomass in marginal lands using SAR data.

The secondment was carried out at Aristotle University of Thessaloniki in Greece, between June and August 2020. As part of my secondment, I worked on Task 2.6 "Estimation of Biomass volume at low productivity MLs", focusing on utilizing a combination of different datasets (e.g. SAR, optical, LiDAR). I implemented a method that uses data from SAR interferometry and LiDAR in a forest biomass model for Above Ground Biomass estimation in pilot test sites in Spain. Working alongside Simonas Garsva and Jesús Torralba Pérez on this topic, I presented my work as one of the other methods for biomass estimation for developing such methods for future tasks in the MAIL project.

[Watch video](#)



My name is Jesús Torralba Pérez. I am a Forestry and Natural Environmental Engineer from the University of Castilla-La Mancha (Spain) and I studied a master's degree in Remote Sensing at the Universidad Mayor (Chile). Since the end of 2017, I am a PhD student in Geomatics Engineering at the Geo-Environmental Cartography and Remote Sensing Group (CGAT)

at the Polytechnic University of Valencia. My PhD is focused on the characterization of forest structure and forest fuel by integrating analysis of methods based on Terrestrial Laser Scanning (TLS), airborne LiDAR and imaging. My interests and experiences are focused on the analysis and management the forest resources and natural environments with remote sensing and GIS in the framework of climate change.

During my stay at the IABG in Dresden/Germany in September 2020 I was working on task 2.6 "Estimation of biomass volume at low productivity MLs". In this period, I estimated the above-ground biomass in the MAIL project test sites using aerial LiDAR data. I compared with other secondees the results obtained in the estimation of the above-ground biomass with LiDAR and different RADAR methodologies and together we wrote the report 2.5.

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My name is Michał Krupiński and work as geospatial analyst in Space Research Centre of the Polish Academy of Sciences in Warsaw (Poland). I received B.S. (2010) and M.S. (2012) degree in geodesy and cartography from Military University of Technology in Warsaw. I was involved in number of R&D projects focused on geospatial data analysis.

My research interests include novel methods for satellite imagery classification and imaging spectroscopy. I'm also strongly involved in the Copernicus User Uptake in Poland.

My secondment took place from the first to the last day of August 2020. Within this time, I worked on the task 2.3 which is focused on the development of methods for marginal lands mapping. I continued the work performed by Rodrigo, Natalia and Maria and applied the algorithms which they have developed to the area of Europe. In these algorithm various databases are used. They contain information like land cover, land use or soil properties. It requires Big Data processing and finding solutions for optimization.

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My name is Ewa Gromny. I am a graduate of Military University of Technology and currently I am working for the Space Research Centre of the Polish Academy of Science in Warsaw as a geospatial analyst in the Earth Observation Department.

My area of interest covers among others the classification of satellite images. So far, I have been mostly focused on optical imagery from Sentinel-2 satellites and lately I took part in the project S2GLC which outcome is the Land Cover map of Europe for 2017.

In September 2020 I have been seconded to IABG In Dresden/Germany. Within this time, I have been working on the task 2.3. which is focused on the development of methods for marginal lands identification and mapping. My main activity was to apply hard threshold approach for Europe to exclude areas which certainly are not considered to be mapped as marginal lands. The variety and vast capacity of databases used in this algorithm made it quite demanding to process and required finding new solutions.

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My name is Juan Pedro Carbonell Rivera and I am an engineer in Geomatics and Topography by the Universitat Politècnica de València (UPV) with a M.Sc. in Geomatic Engineering

and Geoinformation by the UPV and a M.Sc. of the International Master in Geomatics of the Hochschule Karlsruhe – Technik und Wirtschaft (HsKA).

Since September 2018 I am PhD student in Geomatics Engineering UPV. My research is focused on characterisation of forest structure by integrated analysis of methods based on Unmanned Aerial Vehicle (UAV) derived imagery.

During this period, I have accomplished two secondments at HOMEOTECH (Thessaloniki, Greece). The first secondment was involved with the task 5.4: "Guide on success stories for remote sensing techniques and open source data / applications". This task was based on a review of literature and other sources, focusing on three different aspects: "Forests, carbon sequestration and remote sensing", "Satellite monitoring of marginal lands" and "Carbon-based management on marginal lands". The second secondment was dedicated to task 2.9 "Web application for MLs' management", where I have been working together with Alfonso Abad to develop a web-GIS portal capable of produce thematic maps and generate semiautomatic classifications of ML. This portal will allow end-users to determine the best possible way to visualize, monitor and sustainably utilize MLs, and to draw conclusions and decision-making, in field of forest management, planting etc.

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MAIL - Identifying Marginal Lands in Europe and strengthening their contribution potentialities in a CO2 sequestration strategy

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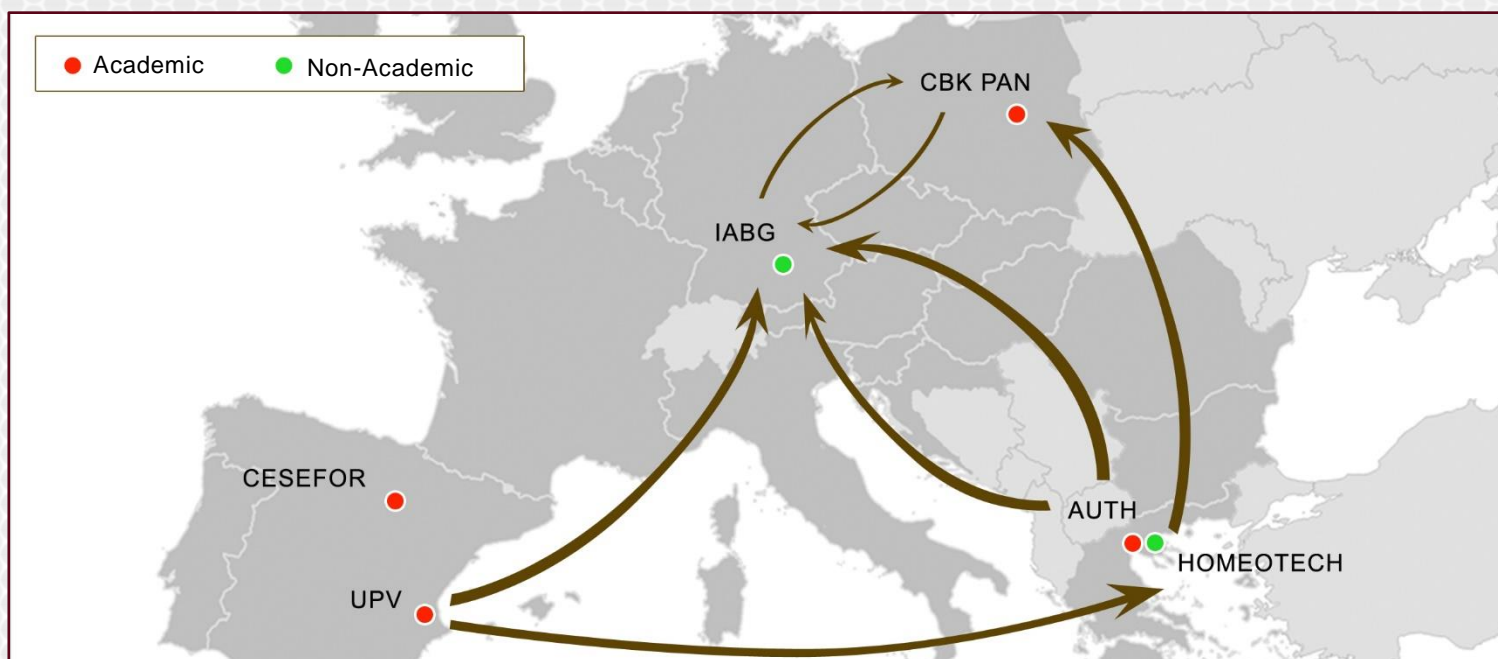


Dr. Sebastian Aleksandrowicz, M.Sc. In 2007 in geomatics from the Military University of Technology in Warsaw, Ph.D. in 2019 – technical sciences from the University of Science and Technology in Cracow. He works as geomatics specialist – researcher at CBK PAN, employee of the Earth

Observation Department. He is responsible for the development of pixel based and object based image classification and change detection methods, data processing including atmospheric correction and image orthorectification.

Sebastian Aleksandrowicz secondment was realized in IABG Geodata Factory, located at Dresden, Germany from August 31st until September 29, 2020. During his secondment he was working for Task 2.3 "Methodology development of mountainous/semi-mountainous Marginal Lands detection". His work based on the workflow developed and tested on selected test sites by previous secondees. He used Corine Land Cover and Sentinel-2 based Land Cover maps to extract agricultural areas over the area of Europe. This task required to work efficiently on big datasets. Outcomes of this work will be used in the further processing.

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The directions of secondments from period January and October 2020

About the Project

- Topic: MSCA-RISE-2018 Marie Skłodowska – Curie Research and Innovation Staff Exchange
- Title: Identifying Marginal Lands in Europe and strengthening their contribution potentialities in a CO2 sequestration strategy
- Project Duration: 36 months
- Official start of the project: 01/01/2019
- Total budget: 800,400.00 €
- EU funding: 800,400.00 €

Consortium

