



Invitation to participate in the EARSeL Special Interest Group (SIG)

Land Use & Land Cover

About the SIG

The EARSeL SIG LULC has been founded to bring together scientists and agencies working on monitoring and quantifying land use and land cover by the means of remote sensing. In this regard, a fundamental field in this domain has been both the continuous improvement of algorithms for classification of land cover and land use as well as quantifying changes to allow for the support of ecological and climate monitoring as well as to provide decision-support for land managers. For this purpose, the SIG is open to all kinds of sensors such as optical, thermal, microwave or LiDAR and also welcomes remote sensing from different remote sensing platforms, such as satellite, airborne and UAV.

Our vision 2021-2024

Since 2021, we have the honour to be appointed as chairpersons and aim to continue the valuable work done by the previous leaders to bring the effort forward enlarging the EARSeL network and connecting it with the major efforts at the regional and global scales as well as cooperate with relevant LCLUC regional and international programs, primarily the NASA LCLUC. For the actual period (2021-2024), our vision and overall aim is twofold:

- Enhance **Open and Reproducible EO Science** in the context of **Data Cubes**
- Integrate **Essential Climate Variables** (ECVs) into LULC(C) research and consistency assessment

Our first main objective for this SIG is to enhance and strengthen Open and Reproducible EO Science. Indeed, Open Science is increasingly advocated for making scientific research more accessible and usable by different categories of users. However, Earth Observations Open Science is still undervalued, and different challenges remain (e.g., socio-cultural, technological, political, organizational, economic, and legal) to achieve the vision of transforming EO data into actionable knowledge by lowering the entry barrier to massive-use Big Earth Data analysis and derived information products. Consequently, it is crucial to support the development of effective means to build socially robust, transparent, accessible, replicable, and reusable knowledge, to generate decision-ready products based on Land Use & Land Cover data. In this regard, we think that the Data Cube technology together with dense time-series (e.g., Landsat and Sentinel) in Europe will improve LCLUC monitoring.



The second main objective is dedicated to the thematic expansion/intensification of ECVs and their impact assessment of LULCC, which could be worth considering for several reasons. The current situation is that research on the intercomparison of diverse ECVs is still at its infancy while impact assessment of LULCC regarding bio geophysical effects using ECVs is gaining importance to assess and understand global change. As satellite derived ECVs become more available, they will also be used to analyse LULCC effects. Therefore, knowledge and integration of the uncertainties of individual ECVs will be of great importance. In this regard, EARSEL's SIGs on various ECVs (i.e., forest fire, land ice and snow, thermal remote sensing) offer great potential for collaboration. We want to stimulate particularly research both in the field of ECV intercomparison studies and LULCC impact assessment. The workshops of the SIG should serve as platforms to foster regional research across institutes, accounting for the diversity of LULC types.

Ultimately, LULC remote sensing is critical to contribute to applied research using powerful geospatial and statistical analyses in environmental sciences with the objective to serve as a source of "actionable" and timely early warnings of emerging issues and environmental change, and related multi-scale assessments, based on scientific data, indicators, and real-time information, and help to catalyse "evidence-based" responses. To reach this objective, we think that a paradigm shift is essential moving from traditional data-centric approaches to information- and knowledge-centric approaches. To fully realize the value chain of EO data, the Data- Information-Knowledge-Wisdom (DIKW) paradigm can facilitate evidence-based decision-making processes and inform us about Earth's limits. Therefore, exploring how best to apply DIKW on LCLUC would be valuable.

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