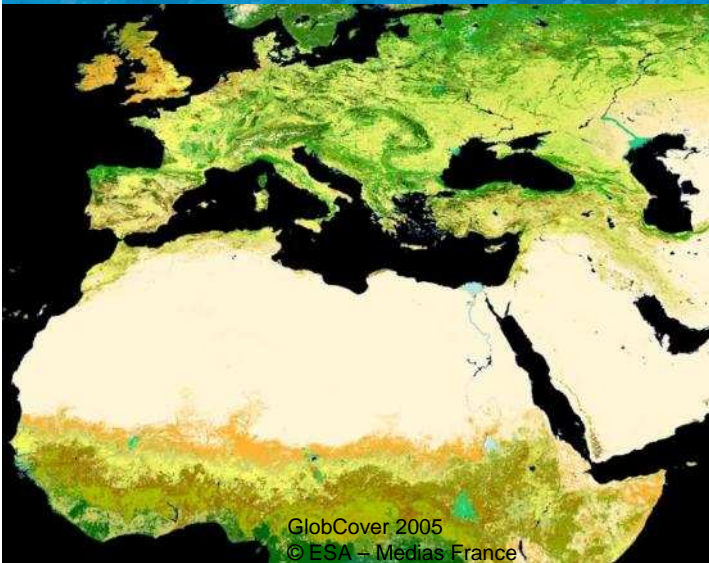


→ CLIMATE CHANGE INITIATIVE

Land Cover CCI Newsletter

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Land Cover CCI User Requirement

During the first three months of the Land Cover (LC) CCI project, a user requirement analysis has been conducted to derive the specifications for a new global LC product that addressed the needs of key-users from the climate modeling community. This user assessment has provided the next step to further derive more detailed characteristics and foundations to observe LC as an Essential Climate Variable.

As part of this analysis, a user consultation mechanism was set-up to actively involve different climate modeling groups by setting out surveys. These surveys focused on 3 major ways LC observations are used in climate models:

- 1) as proxy for several land surface parameters assigned based on Plant Functional Types (PFTs);
- 2) as proxy for human activities, i.e. land use affecting land cover;
- 3) as datasets for validation of model outcomes or feedback effects.

The evolution of requirements for these aspects from current models to future new modelling approaches was specifically taken into account. In addition, the broad LC data user community, represented by users of the ESA GlobCover product, was also surveyed. Next to the surveys, requirements from GCOS and associated strategic earth observation documents for LC were considered and integrated. Finally, a detailed literature review was carried out.

The outcome of the assessment has shown that although the range of requirements coming from the climate modelling community is broad, there was a good match among the requirements coming from different user groups and the broader requirements derived from GCOS, Climate Modelling User Group (CMUG) and other relevant international panels.

The findings of the user requirement analysis highlight that:



land cover
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- UR1: There is a need for both **stable** LC data and a **dynamic** component in the form of time-series and changes;
- UR2: **Consistency** among the different model parameters is often more important than accuracy of individual datasets, and it is important to understand the **relationship between LC classifiers with the parameters** and the relative importance of different LC classes;
- UR3: Providing information on **natural versus anthropogenic vegetation** (disturbed fraction), tracking human activities and defining history of disturbance is of increasing relevance;

- UR4: LC products should provide **flexibility** to serve different scales and purposes both in terms of spatial and temporal resolution;
- UR5: The relative importance of **different class accuracies** varies significantly depending on which surface parameter is estimated and the need for stability in accuracy should be reflected in implementing a multi-date accuracy assessment;
- UR6: Future requirements for temporal resolution refer to **intra-annual and monthly dynamics** of land cover including also remote sensing time series signals;
- UR7: More than 90% of the general land cover users find the **United**

Nations Land Cover Classification System (UN-LCCS) a suitable approach for thematic characterization; and this approach is also quite compatible with the PFT concept of many models;

- UR8: The quality of LC products needs to be **transparent** by using quality flags and controls, and including information on the probability for the land cover class or anticipated second class or even the probability distribution function for each class (coming from the classification algorithm).

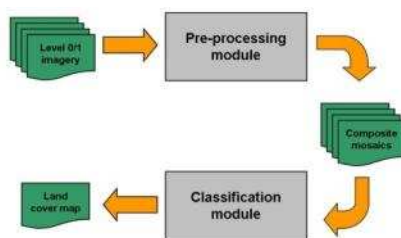
The complete « User Requirements Document » is available at: <http://www.esa-landcover-cci.org/>

Round Robin launched on 1st April 2011

The objective of the Round-Robin (RRob) is the selection of the “best” algorithm(s) or combination of algorithms by enabling the inter-comparison of varying algorithms. This is an open activity in which external research groups are invited to develop and propose their own methodologies.

The overall objective of the Land Cover CCI project is to deliver, in a consistent way over years and from various Earth Observation instruments, global land cover products matching the needs of key users belonging to the Climate Modeling Community. To this end, a prototype system will be developed, based on a set of **pre-processing** and **classification** algorithms that will be assessed during the RRob activity.

On the **pre-processing** side, the RRob will focus on five steps: (i) pixel identification, (ii) aerosol retrieval, (iii) atmospheric corrections, (iv) BRDF correction and (v) compositing algorithm. On the **classification** side, the RRob will test (i) a global and generic classification method and (ii) class-specific algorithms for urban areas and for water bodies based on optical and SAR data.



Schematic illustration of the pre-processing and classification modules articulation.

The entire RRob effort is intended to be as transparent as possible. All interested parties are invited to participate through a standardized

environment, in which datasets and information on the procedure are equally shared with all participants. In particular, the scope of the exercise, the input datasets, the expected output, the validation datasets and the evaluation methodology are defined in advance and described in an accompanying document.

The RRob officially starts on 1st April 2011. Detailed information can be found on the CCI-LC website (<http://www.esa-landcover-cci.org/>)

