

Report on the CEOS Cal-Val Land Cover Validation Workshop (Land Product Validation) meeting, Boston University, 2-4 February 2004

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Background

An initial meeting focussed on the assessment of land cover map accuracy was held at the Joint Research Centre (JRC), Ispra, in March 2003 under the chairmanship of Professor Strahler. An output from that meeting was the skeleton of an outline document of 'best practices' for accuracy assessment of global scale land cover maps. A major aim of the current meeting was to develop the document further with final completion anticipated later in 2004.

The Meeting

Building on the work established at the JRC, this meeting composed two main parts that were roughly equal in length:

- (1) The meeting started with a series of presentations giving an overview of the group's activities and specific issues in accuracy assessment. These provided a context for the meeting and up-dated delegates on recent relevant research issues.

Briefly, the main presentations were:

Speaker	Topic
Strahler (Boston University)	Introductory overview, focussed especially on the nature of the 'best practices' document and its structure.
Morisette (NASA GSFC)	Overview of CEOS Cal-Val activities.
Cook (Oak Ridge National Lab.)	Overview of ORNL DAAC validation activities.
Friedl (Boston University)	Discussion of MODIS land cover products and accuracy.
Hansen (Maryland)	Discussion of continuous fields products and accuracy.
Boschetti (JRC)	Overview of the GLC-2000 map and its validation.
Zhao (University of Michigan)	Presentation of a regional case study.
Brown de Colstoun (NASA GSFC)	Discussion on NPOESS program.
Zhang (Boston University)	Observations on global phenology from MODIS.
Strahler (Boston University)	Overview of the 'best practices' document and plans for development.
Foody (University of Southampton)	Overview of accuracy assessment methods and problems.
Stehman (State Univ. of New York)	Overview of design-based sampling methods for accuracy assessment.
Friedl (Boston University)	Overview of model-based sampling methods for accuracy assessment.
Woodcock (Boston University)	Summary and discussion of issues for consideration.

Throughout there was considerable input from delegates (the number of delegates was fluid but typically about 20 people attended the sessions).

(2) The group was broken down into sub-groups to develop the outline 'best practices' document. The main sub-groups and chair person were:

Accuracy assessment – Foody
Design-based approaches – Stehman
Model-based approaches – Friedl
Qualitative approaches – Boschetti
Land cover change - Morisette

Each group developed the text on the relevant part of the outline 'best practices' document. Occasional feedback sessions to the entire group were held to inform others of progress and identify problematical sections (e.g. areas of potential overlap). The final meeting of the group considered plans for future work and recommendations to take forward. This involved input from all the sub-group chairs as well as delegates, including key figures in the field such as Loveland (USGS), Woodcock (Boston) and Townshend (Maryland).

The meeting was relaxed but of a high quality with the hosts providing excellent hospitality.

Output and recommendations

Aside from a greater understanding of the issues connected with the assessment of the accuracy of global land cover maps, the main output was a substantially revised version of the 'best practices' document. Over the course of the meeting this went, essentially, from a detailed table of contents to a, variably, fleshed-out document. The intention is for this for the document to further develop, with inputs particularly from the sub-group chairs enhancing the text and with Professor Strahler acting to help integrate material and refine the whole document. Possible publication outputs were discussed. These include a formal CEOS Calibration-Validation report and possibly a shortened version for a journal to ensure wider dissemination amongst the research community. Possible recommendations to the WGCV to be conveyed by Morisette were discussed and included the need for a workshop on the assessment of the accuracy of maps depicting continuous fields of land cover, the need to stress the importance of accuracy assessment and the requirement for further research on the topic as well as increased user involvement and the possibility of integrating work associated with GLC2000 and MODIS land cover activities with those associated with CEOS, particularly in relation to land validation core sites for inter-comparison of products. In addition, a series of general issues that may be included in Morisette's recommendations include general observations on the particular problems faced in mapping at a global scale (e.g. mixed pixels), the need to recognise the statistical implications of sampling designs adopted and recognise that the assessment of map accuracy is critical for proper scientific use of the maps as well as raise awareness that the requirements for land cover map accuracy assessment are markedly different to those for other land products.