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IMPROVING GLOBAL LAND COVER VIA CROWD-SOURCING AND PRODUCT INTEGRATION

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ABSTRACT:

In the last 10 years there has been a drastic increase in global land cover datasets. The trend has been towards higher resolution, higher update frequency, the use of multiple years to find sufficient cloud free images and a move towards maps which focus on one specific theme such as forests, cropland and urban areas. Although the resolution has been increasing, processing algorithms have become more sophisticated and data have become more freely and openly accessible, there are still places in the world where the most recent products disagree.

This presentation highlights examples of disagreement and innovative approaches that can determine which map is better at a certain location. It furthermore demonstrates how existing maps can best be integrated using photo interpretations of more than 5 million observations of very high resolution imagery such as that found on Google Earth. The crowd-sourced observations have been collected using 6 competitions run on the geo-wiki.org platform and a cross-platform game called Cropland Capture.

To integrate the products a geo-statistical technique called geographically weighted regression (GWR) and a country ranking approach have been used together with the crowd-sourced observations and national and sub-national statistical datasets. Integration has been performed on a global land cover dataset, a global forest cover dataset and a global cropland dataset.

The results show that the integrated global land cover map resulted in lower overall disagreement than the individual global land cover maps (GLC-2000, MODIS and GlobCover). A similar result was achieved for two integrated global forest cover products, one which was calibrated with national statistics and a best map where the individual products namely GLC2000, MODIS, GLOBCOVER), MODIS Vegetation Continuous Fields (VCF), and forest maps based on Landsat, showed lower accuracies. In the cropland domain the integrated product also showed higher accuracies compared to the Earthstat cropland product.

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