International Institute for Applied Systems Analysis
IIASA www.iiasa.ac.at

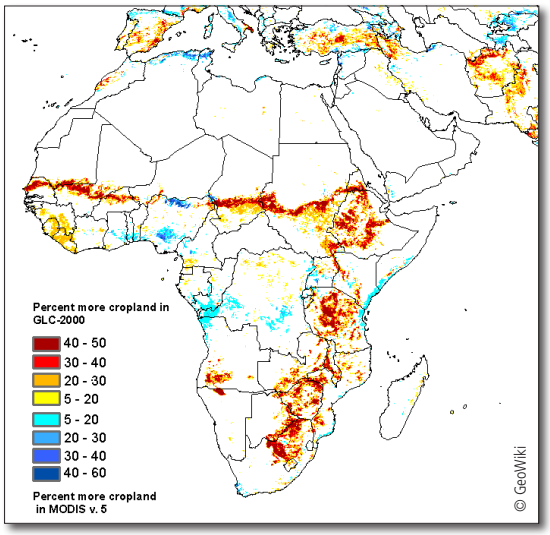
Impacts

Crowdsourcing and Gaming Reveal Land Cover

IIASA researchers have launched several initiatives to reduce uncertainties in the mapping of land cover, mobilizing partners in the national and international mapping communities to share data and products to develop an accurate cropland extent map for Africa—and globally—at minimal cost. IIASA is also now seeking the participation of citizen scientists in its mapping projects.

Background

Depiction of land cover data, especially cropland, in different satellite products is frequently uncertain. As such products (Globcover, GLC 2000, Modis) were designed to deliver medium-resolution spatial images of global dynamic processes, they often cannot be used to make firm distinctions between different types of vegetation. With a projected world population of 10 billion by 2050, accurate estimates of cropland are crucial for the food-security and land-use modeling communities and the policymakers they support.



Geo-Wiki

Geo-Wiki, developed by IIASA and two partners, uses crowdsourcing for collecting and verifying land cover data via higher-resolution Google Earth images. In Geo-Wiki, registered volunteers review locations or "hotspots" where data are missing or where satellite images disagree over the land cover type. These data, checked and validated by the Geo-Wiki development team, are made freely available to researchers, decision makers, and land managers online.

Cropland Capture

IIASA is using games and social networking to build a citizen scientists network. For example, well over 2,500 people have participated in the IIASA game, Cropland Capture, on tablet, mobile phone, and desktop computer, validating over 2.5 million km^2 of land cover data: half the size of the European Union.

Further information:

www.iiasa.ac.at/impacts/crowdsourcing

A new project, CrowdLand, financed by an ERC grant won by an IIASA scientist will focus on two pilot areas, Austria and Kenya, where a local network of citizen scientists will collect comparable data via smartphone applications. Kenyan volunteers will be offered micropayments for capturing data.

Impacts

- Science plus gaming is the new frontier, and IIASA's Geo-Wiki project is at the forefront of gaming and associated technology use in the environmental context. IIASA's Cropland Capture game, where players travel through satellite images of the Earth looking for arable land, is spreading the word for the environment. It was listed among the top 10 education games of 2013 and featured by the BBC, The Economist, and The Guardian.
- In addition to interactive projects like Cropland Capture, Geo-Wiki also runs crowd-sourcing campaigns to collect data to help answer specific research questions such as land availability for biofuels, wilderness mapping, and assessment of land grabbing. Following research by scientists using crowdsourcing of Google Earth images in Geo-Wiki, scientists downgraded estimates of the land available for growing biofuel crops by up to 50%.
- For Ethiopia, where access to up-to-date maps was entirely controlled by military and government agencies, IIASA used a crowdsourcing campaign to map cropland, collecting 80,000 samples over a three-week period for roughly 5% of the country's area. Data, still under collection, are freely available on the Internet.
- Geo-Wiki's functionality and geographic reach are expanding. "AusCover" was added providing an online and mobile means to test and validate maps of land-cover and biophysical variables in Australia. "Livestock Geo-Wiki" was extended and is being used to provide a central repository for global maps of livestock distributions and production systems from the International Livestock Research Institute, Nairobi, and the Food and Agriculture Organization, Rome.
- The US federal agency, the National Oceanic and Atmospheric Administration, is encouraging the use of Geo-Wiki among school age groups using the Globe network as a mechanism for learning about the environment. Geography Geo-Wiki was modified in 2013 for use in undergraduate class assignments at the University of Waterloo, Canada.

ZVR-Nr: 524808900: