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Cropland Capture: A Game to Improve Global Cropland through Crowdsourcing

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Accurate and reliable global cropland extent maps are essential for estimating and forecasting crop yield, in particular losses due to drought and production anomalies. Major questions surrounding energy futures and environmental change (EU and US biofuel target setting, determination of greenhouse gas emissions, REDD initiatives, and implications of climate change on crop production and productivity patterns) also require reliable information on the spatial distribution of cropland as well as crop types. Although global land cover maps identify cropland (which exist as one or more land cover categories), this information is currently not accurate enough for many applications.

There are several ways of improving current cropland extent though hybrid approaches and by integrating information collected though Geo-Wiki (a global crowdsourcing platform) from very high resolution imagery such as that found on Google Earth. Another way of getting improved cropland extent maps would be to classify all very high resolution images found on Google Earth and to create a wall-to-wall map of cropland. This is a very ambitious task that would require a large number of individuals, like that found in massive multiplayer online games. For this reason we have developed a game called 'Cropland Capture'. The game can be played on a desktop, on a tablet (iPad or Android) or mobile phone (iPhone or Android) where the game mechanics are very simple. The player is provided with a satellite image or in-situ photo and they must determine if the image contains cropland or not. The game was launched in the middle of November 2013 and will run for 6 months, after which the weekly winners will be entered into a draw to win large prizes. To date we have collected more than 2.5 million areas, where we will continue to expand the sample to more locations around the world. Eventually the data will be used to calibrate and validate a new version of our global cropland map, where the latest version is available from http://beta-hybrid.geo-wiki.org. If we find, however, that a large number of people participate in the game, we will aim to make wall-to-wall cropland maps for those countries where no national maps exist. This paper will present an overview of the game and a summary of the crowdsourced data from the game, including information about quality and user performance.

If successful, this gaming approach could be used to gather information about other land cover types in the future in order to improve global land cover information more generally.