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Project "Cropland Abandonment Mapping" - Final report

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Disclaimer

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Purpose

Cropland abandonment is a common type of land-use change across the globe and can be caused by a range of social, economic, and environmental factors. Cropland abandonment has wide-ranging effects on the environment, especially on biodiversity and carbon storage. Despite the importance of cropland monitoring, cropland abandonment is difficult to map and not routinely monitored. In this project, we propose to investigate cropland abandonment using remote sensing technique for the application of carbon storage in Eurasia, where experienced extensive cropland abandonment because of drastic social-economic changes since the 1990s.

Scope of work

To produce cropland abandonment maps in Eurasia using available Landsat imagery from 1986 to 2019. One workstation and software including ArcGIS, ENVI will be provided by Kent State University

Data analysis

We analyzed 2581 Landsat 7, 2979 Landsat 8 and 1755 Landsat 5 imagery, a total amount of 1.5 T data to detect cropland abandonment. We classification the imagery using the method that was developed by Yin et al. (2020).

Result

We found that cropland abandonment is widespread in Eurasia in the past 30 years, especially in the drylands where the Chinese government implemented the “Grain for green” project (Figure 1). Most of the abandoned croplands were not converted to grasslands, instead of forests.

We also found that most of cropland abandonment occurred in the marginal lands, for example in mountains, afar from transportation routes or markets.

Our results highlighted the usage of long-term remote sensing record to monitor cropland abandonment at a large geographical extent.

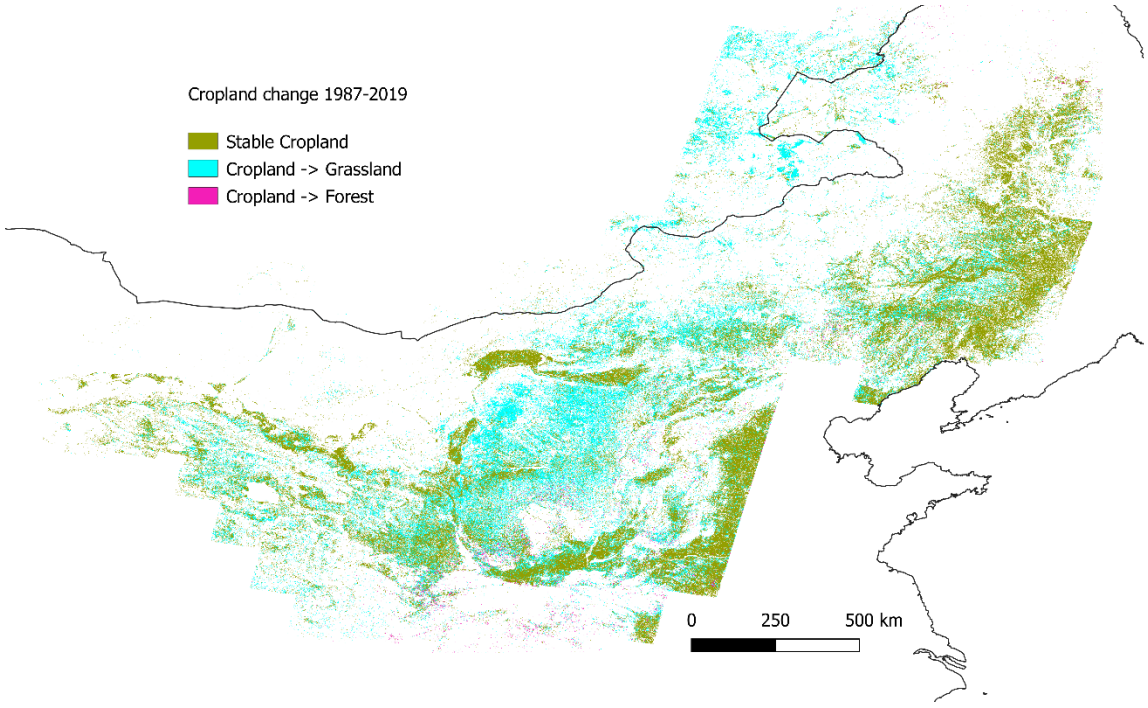

Figure 1 Cropland change between 1987 and 2019

Reference

Yin, H., Brandão, A., Buchner, J., Helmers, D., Iuliano, B. G., Kimambo, N. E., Lewińska, K. E., Razenkova, E., Rizayeva, A., Rogova, N., Spawn, S. A., Xie, Y., & Radeloff, V. C. (2020). Monitoring cropland abandonment with Landsat time series. *Remote Sensing of Environment*, *246*, 111873. https://doi.org/10.1016/j.rse.2020.111873