

Grassland conversion across the United States: Current status, impacts, and policy implications

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The United States has entered a new era of agriculture, defined by revised federal policies, changes to commodity markets, and increased demand for crops for uses like fuel. These drivers have led to changes in our nation's landscape as well as emerging threats and opportunities for grassland conservation¹.

Currently, there are about 400 million acres of grasslands remaining in the United States—equal to roughly half the country's original grassland extent prior to European settlement and the expansion of cultivated agriculture. Thus, looking at the combined area of both grasslands and croplands can give insights into the total area grasslands once occupied across America (**Figure 1**). This ongoing dynamic—the conversion between grasslands and croplands—remains a key issue for grassland conservation today, as conversion to crop production still remains the number one threat to grassland loss, responsible for about 5x as much annual conversion as urban expansion or development.²

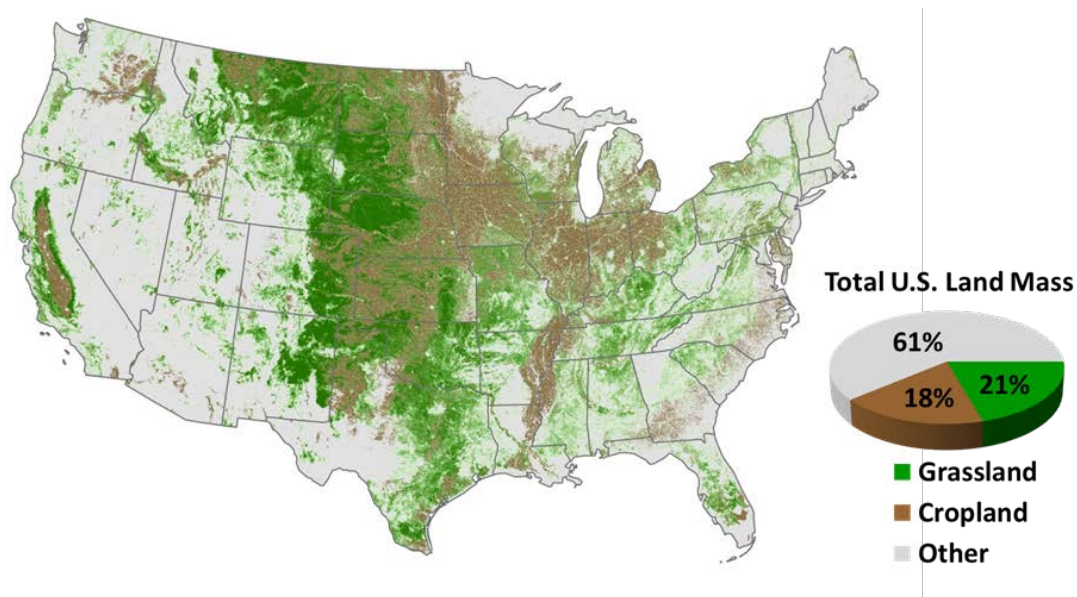


Figure 1: Current U.S. grassland and cropland extent, circa 2014.

To better understand this dynamic, we tracked recent agricultural land-use change across the conterminous United States from 2008-2012. We found widespread transformation of

grasslands to cropland, including significant conversion of long-term undisturbed grasslands that had not been cultivated for over 4 decades. In total, over 6 million acres of grasslands—an area the size of Maryland—were converted to crop production 2008-2012¹. This conversion has substantial implications for wildlife and biodiversity, soil and water quality, and net carbon sequestration.

For example, most new croplands were on marginal land defined as having severe to very severe limitations to cultivation, whereas the majority of pre-existing crop extent was located on prime agricultural land well suited to cultivation (**Figure 2**). Furthermore, the percent of new croplands planted on land deemed unsuitable for cultivation was twice as high as that for pre-existing croplands. As a result, new croplands are likely to generate greater erosion and soil loss, as well as lower yields due to the lower agricultural suitability of this land. In addition, overall indemnity costs of the crop insurance program could rise since crops are being planted in increasingly less suitable and higher risk areas.

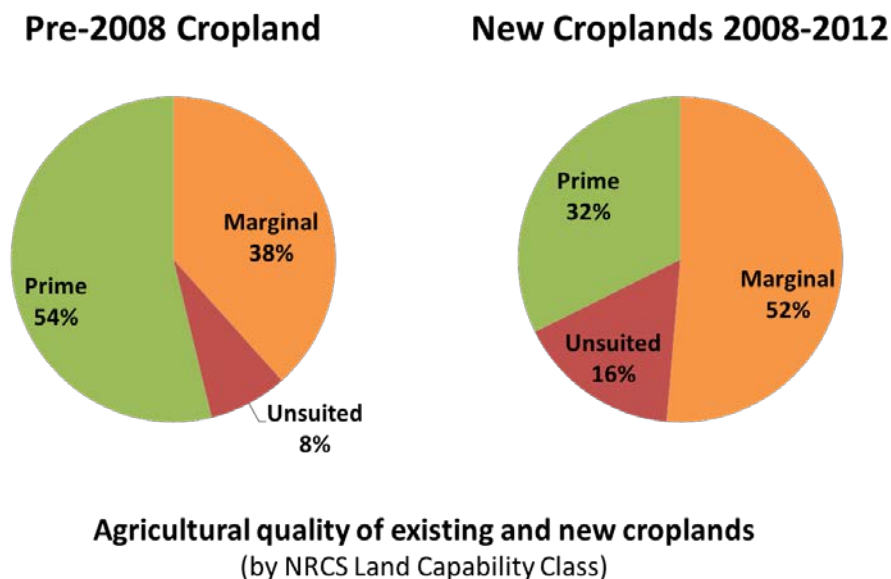


Figure 2: Agricultural suitability of pre-existing and new croplands. New croplands are more likely to be on less suitable land.

The recent changes to the U.S. landscape also reveal opportunities to improve conservation through federal policies, particularly in the U.S. Farm Bill and the U.S. Renewable Fuels Standard. The Sodsaver provision of the 2014 Farm Bill aims to reduce cropland expansion into previously-uncultivated areas by reducing the crop insurance premium subsidies on land converted from native sod. However, we found 2/3rds of conversion from previously-uncultivated land occurred outside the 6 states protected by Sodsaver in the 2014 Farm Bill's

implementation¹. This provides strong evidence that if the Sodsaver policy is to achieve its goal of reducing the cultivation of native sod, nationwide coverage and implementation is needed.

We also found that the current enforcement mechanism of the Renewable Fuels Standard—known as “aggregate compliance”—may be problematic. By law, land eligible for renewable feedstock production under the RFS must have been already “cleared or cultivated” by December 2007³; however, the current aggregate compliance monitoring mechanism is unable to detect fine-scale land conversions that occur across the landscape after this date. Thus, the Renewable Fuel Standard may currently be permitting, rather than preventing, the conversion of grasslands.

In summary, our findings show that recent conversion of grasslands is a nationwide phenomenon, and that aggregate measures of cropland expansion and grassland loss do not capture all the changes that are occurring on the ground. Rather, spatially-explicit assessments of gross land-use changes are needed. We’ve also seen that conversion from grasslands to croplands is occurring in less suitable areas, with significant costs to the environment. Fortunately, closing the gaps in our existing policies may provide effective solutions. In particular, expanding Sodsaver and improving enforcement of the RFS could help protect grasslands while also facilitating more climate-smart approaches to agriculture and bioenergy goals.

References:

Lark, T. J., Salmon, J. M. & Gibbs, H. K. 2015. Cropland expansion outpaces agricultural and biofuel policies in the United States. *Environ. Res. Lett.* **10**, 044003.

U.S. Department of Agriculture. 2013. *Summary Report: 2010 National Resources Inventory*. at <http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1167354.pdf>

Renewable Fuel Standard (RFS2) program (40 CFR 80 Subpart M). Code of Federal Regulations Title 40: Protection of Environment Part 80—Regulation of Fuels And Fuel Additives