EQIPping Farmers for Conservation:

A Space-Time Analysis of the Environmental Quality Incentives Program (2014 – 2023)

Introduction

Since the Dust Bowl of the 1930s, the US has relied on voluntary incentive-based conservation programs to prevent soil erosion, and more recently, to promote broader conservation priorities like soil health, biodiversity, and climate change adaptation. The Environmental Quality Incentives Program (EQIP) was created in the 1996 Farm Bill to fund conservation practices on working farms and ranches. The program is often criticized for providing most of its funding to large, concentrated animal feeding operations. As sustainable agricultural intensification continues to capture public attention, understanding the interactions of EQIP participation, farm characteristics, and animal agriculture will be key to evaluating the impacts of this program and ensuring taxpayer money is directed to public priorities. Based on an analysis of conservation program participation in West Virginia by Oliver & Strager,[1] this work will:

1. **Identify regions of the contiguous US that are consistent participants in EQIP**
2. **Determine if EQIP contracts and funding are disproportionately obligated to certain types of operations**

Identifying Hot and Cold Spots

In ArcGIS Pro 3.1.3, enhanced hotspot analysis was performed on EQIP acreage, contracts, and spending data on the county scale in the Contiguous US for all available data (2014 – 2023). This identified numerous clusters as measured by the 3 different participation data variables (Figure 1). These results were generalized using an overlay that determined overall hot and cold spots if the county was identified as a cluster in at least one of the variables investigated (Figure 2) and summarized by region (data not shown). Results showed the presence of 1 single county of 536 that was a hot spot in the Heartland, even though this area is known for its large proportion of cropland, farms, and agricultural value. In the Prairie Gateway, Fruitful Rim, Basin and Range, and Mississippi Portal, at least 25% of counties were hot spots, with over 50% of the counties in the Mississippi Portal being a hot spot.

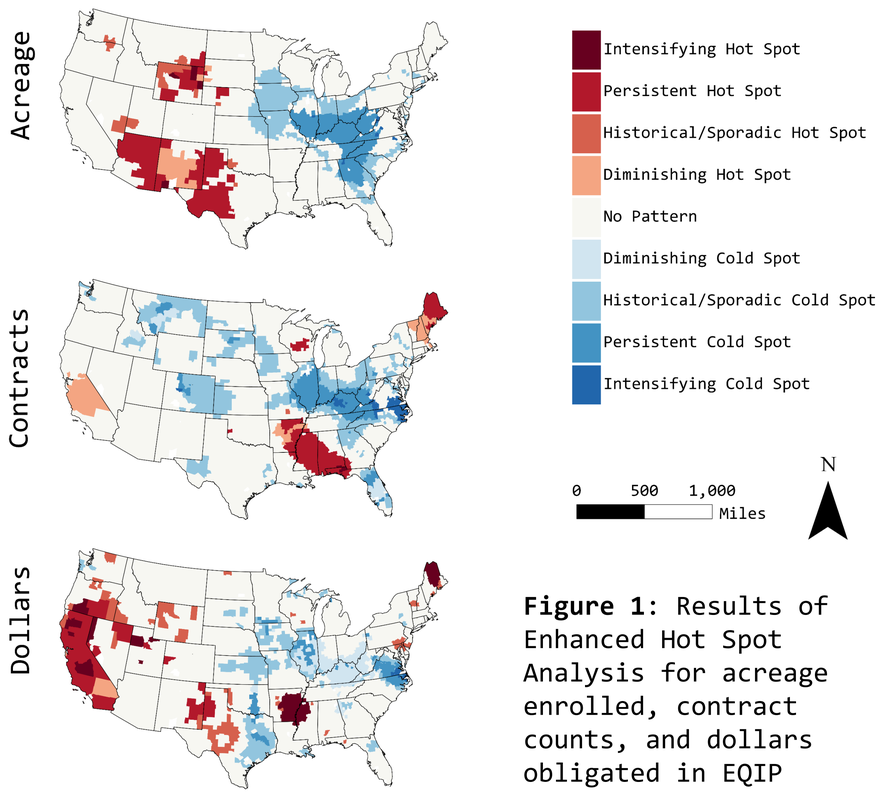

Figure 1: Results of Enhanced Hot Spot Analysis for acreage enrolled, contract counts, and dollars obligated in EQIP

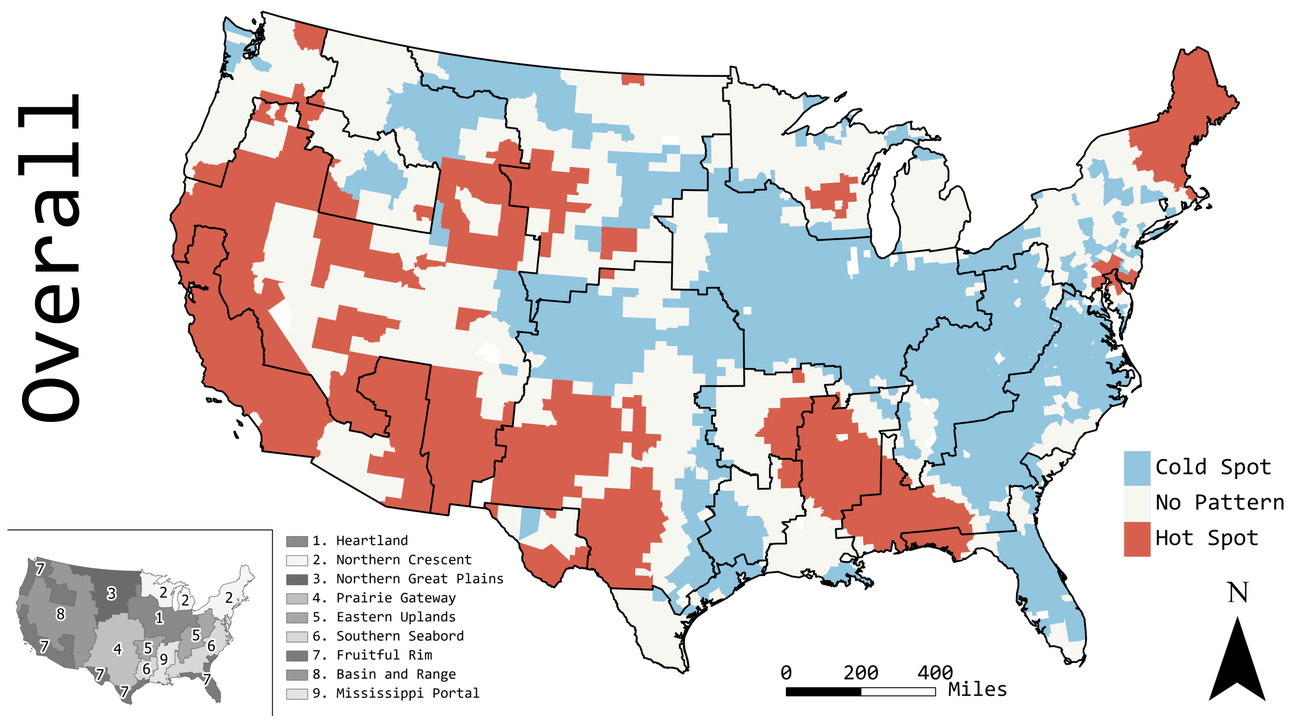

Figure 2: Results of Enhanced Hot Spot Analysis overall with USDA Farm Resource Region boundaries and designations

Characterizing Hot and Cold Spots

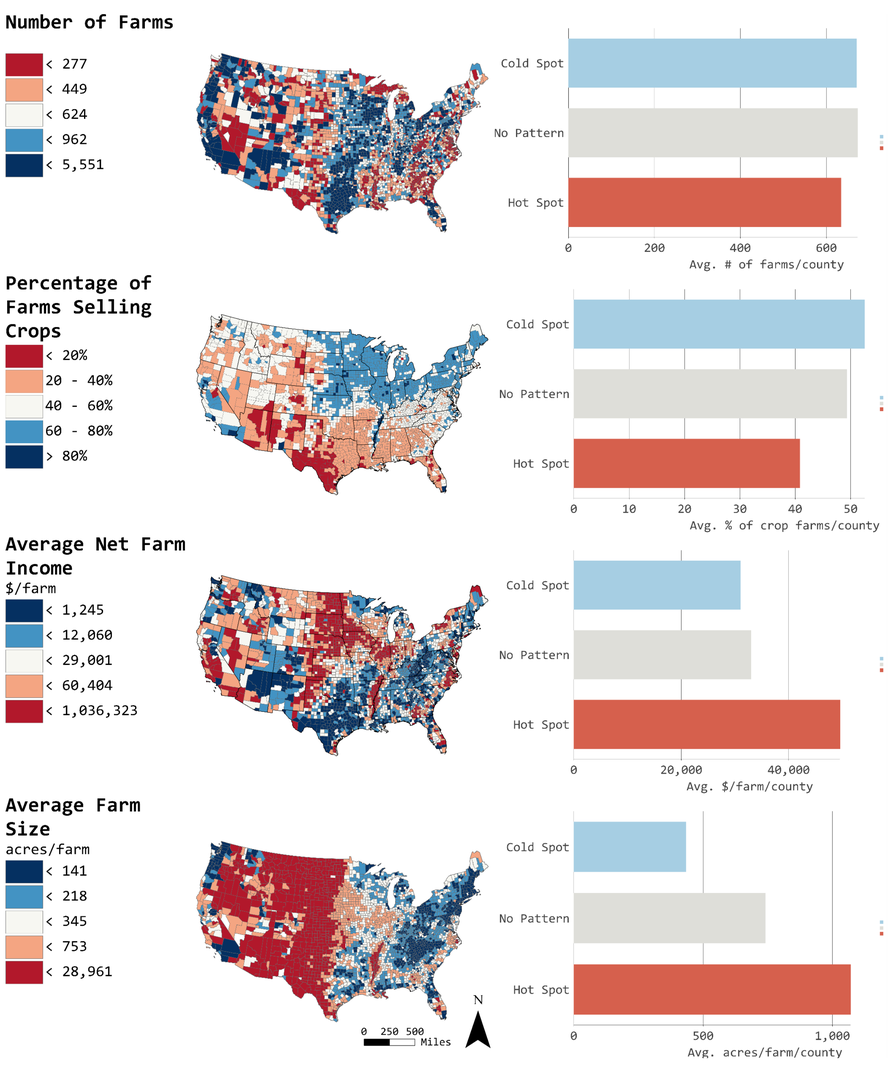

Figure 3: Maps of several farm characteristics and their average value sorted by space-time cluster type

Census of Agriculture Data from 2017 was summarized by the hot and cold spots previously identified (Figure 3) after spatially joining hotspot classification (Figure 2) to the farm characteristics. On average, hot spots were characterized by counties with more animal agriculture, lower farm income, and larger farms/ranches. The trend for number of farms per county was less clear.

Conclusions

Over the past decade, intensification in the dollars spent on EQIP as well as the acreage enrolled has been concentrated in the Southwest and California. Intensifying participation as measured by contracts has occurred in the Mississippi Portal and South perhaps pointing to better outreach to the smaller and minority-operated farms characterizing this region. Results also showed that EQIP has largely left the Heartland region with only 1 county showing increasing participation measured by acreage, contracts, or dollars funded. This has important implications for the broad coalitions of rural and urban citizens that usually support the Farm Bill but have recently fractured. Will the trend of lower participation in conservation programs exacerbate this division?

Additionally, preliminary analysis showed that hotspots for EQIP are characterized by larger, animal-centric operations with higher average farm incomes. This preference for livestock operations is codified in the authorizing legislation for the program, with over 50% of funding required to be spent on livestock practices.[2] It will be important for policymakers to consider if these are the types of farm they want to support, or if instead we should be targeting smaller farms that are already doing the hard work of conservation. As lawmakers look to better include climate change adaptation in programs, they may consider requiring program funds to be spent on other priorities like devoting specific funds to areas that are highly polluted by agricultural runoff or areas with high degrees of air pollution for increased cover cropping. More robust geospatial analysis on the interactions of program participation, operator characteristics, and ecosystem srvices is thus warranted for program evaluation and improvement.

Chad Fisher | UEP 235 | 12.19.23

Projection: NAD 1983 (2011) Contiguous USA Albers | Data Sources: 2017 Census of Agriculture QuickStats, Census TIGER/LINE shapefiles 2020, NRCS EQIP Financial Assistance Dashboard, USDA ERS Farm Resource Regions, USGS National Gazetteer

References:

1. Oliver, M. D., and Strager, M. P. 2021. A spatial analysis of high and low farmer participation in the USDA Natural Resources Conservation Service Conservation Technical Assistance program in West Virginia. *Journal of Soil and Water Conservation*, *72(2)*, pp. 130-141.
2. Stubbs, Megan. July 28, 2022. CRS Report R40763 (Agricultural Conservation: A Guide to Programs).

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