Are Farmers Adapting to Drier Conditions? Crop Choices and Irrigation Adoption in the Danube River Basin

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Motivation

- Under climate change, farmers respond to the changes in crops' productivity by adjusting their crop and management choices.

- We may overstate climate change impacts if we do not also consider other adaptation mechanisms adopted by farmers.

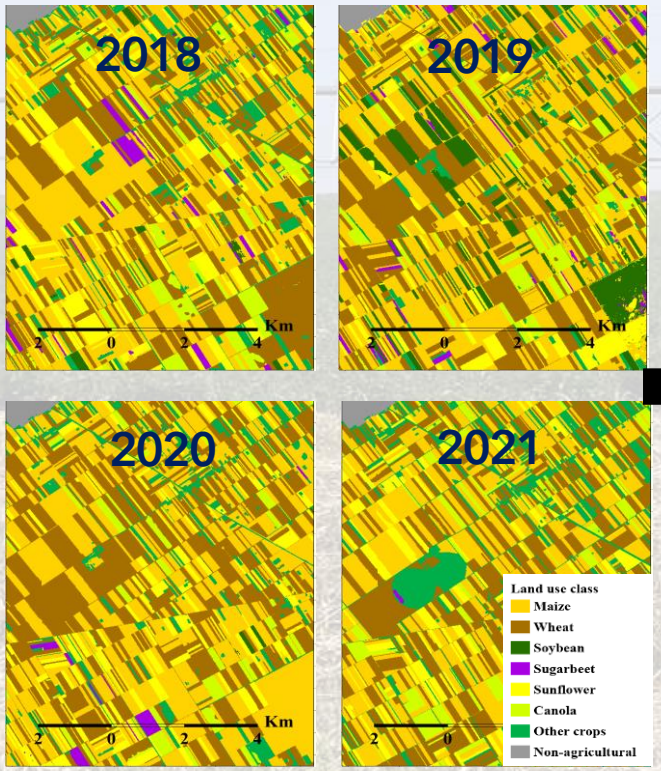
We ask two research questions:

1. How does changing water availability affect farmers' **crop choices**?
2. Under which conditions do farmers adopt irrigation?

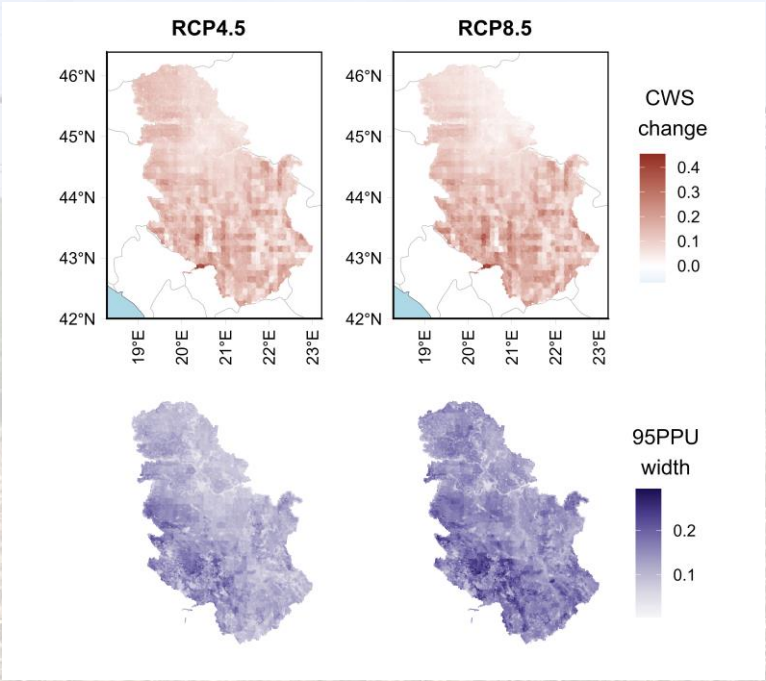
Context: Serbia, characterized by complex crop rotations and increasing drought

Process

Multi-year crop classification
LSTM and domain adaptation

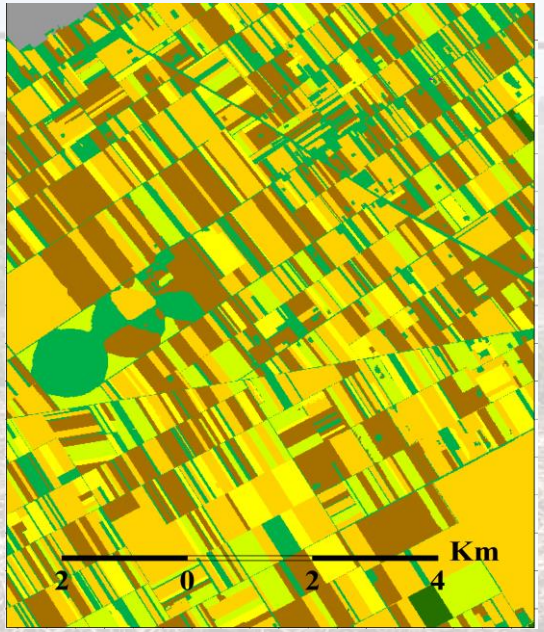


Hydrological modeling incorporating crop rotations and irrigation



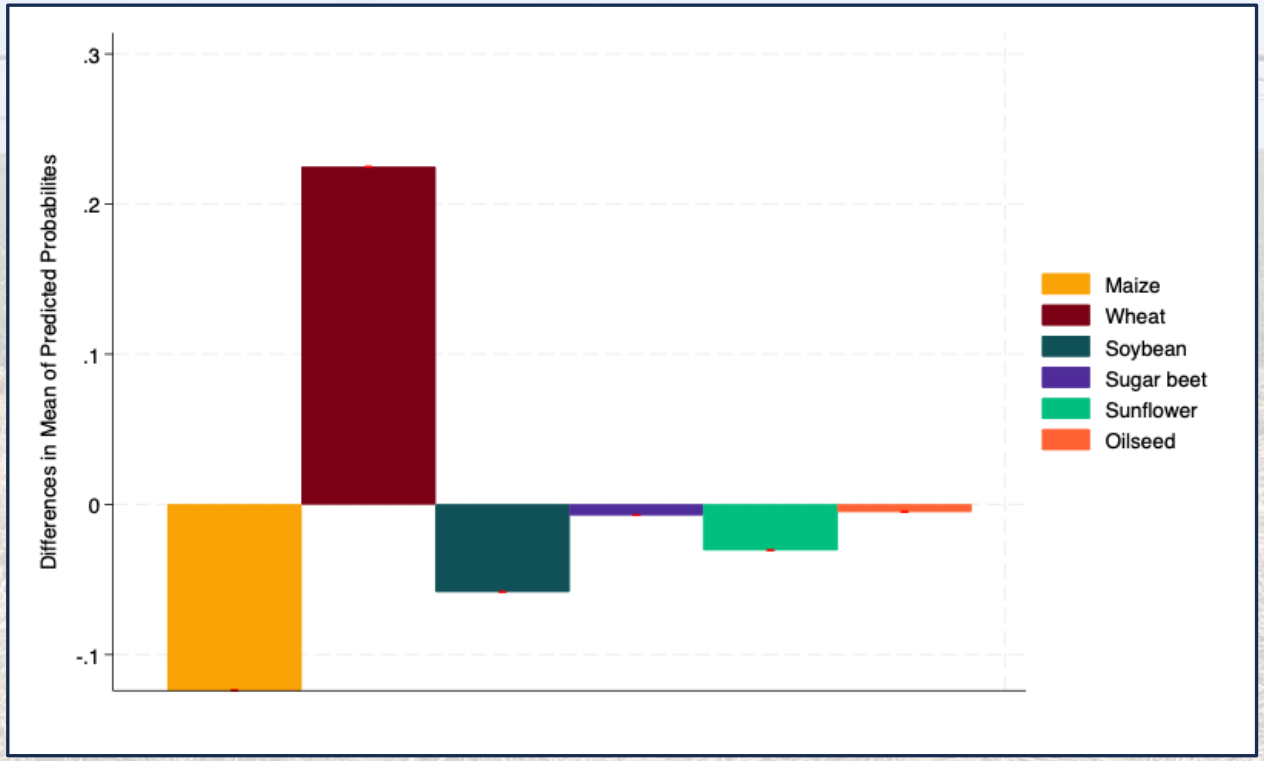
Increasing crop water stress (2041-2070)
July, August, September

Land use change:
Crop choice and irrigation adoption = *f (prices, weather, soil moisture)*



Results

Crop Choice Predictions after Reduction in Spring Soil Moisture



Irrigation Adoption Model

Variables	Correlated Random Effects
Lagged Irrigating Season Temperature	0.016*** (0.001)
Lagged Irrigating Season Soil Moisture	-0.00012*** (6.45e-06)
30-yr average of Irrigating Season Temperature	0.092*** (0.0054)
30-yr average of Irrigating Season Soil Moisture	0.00044*** (1.83e-05)
Soil Quality	0.05*** (0.0076)
Elevation	9.31e-05*** (1.24e-05)
Field Size	3.21e-06*** (4.64e-08)