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# Second-Home Buyer, Preferential Property Tax and Agricultural Land Cover Change

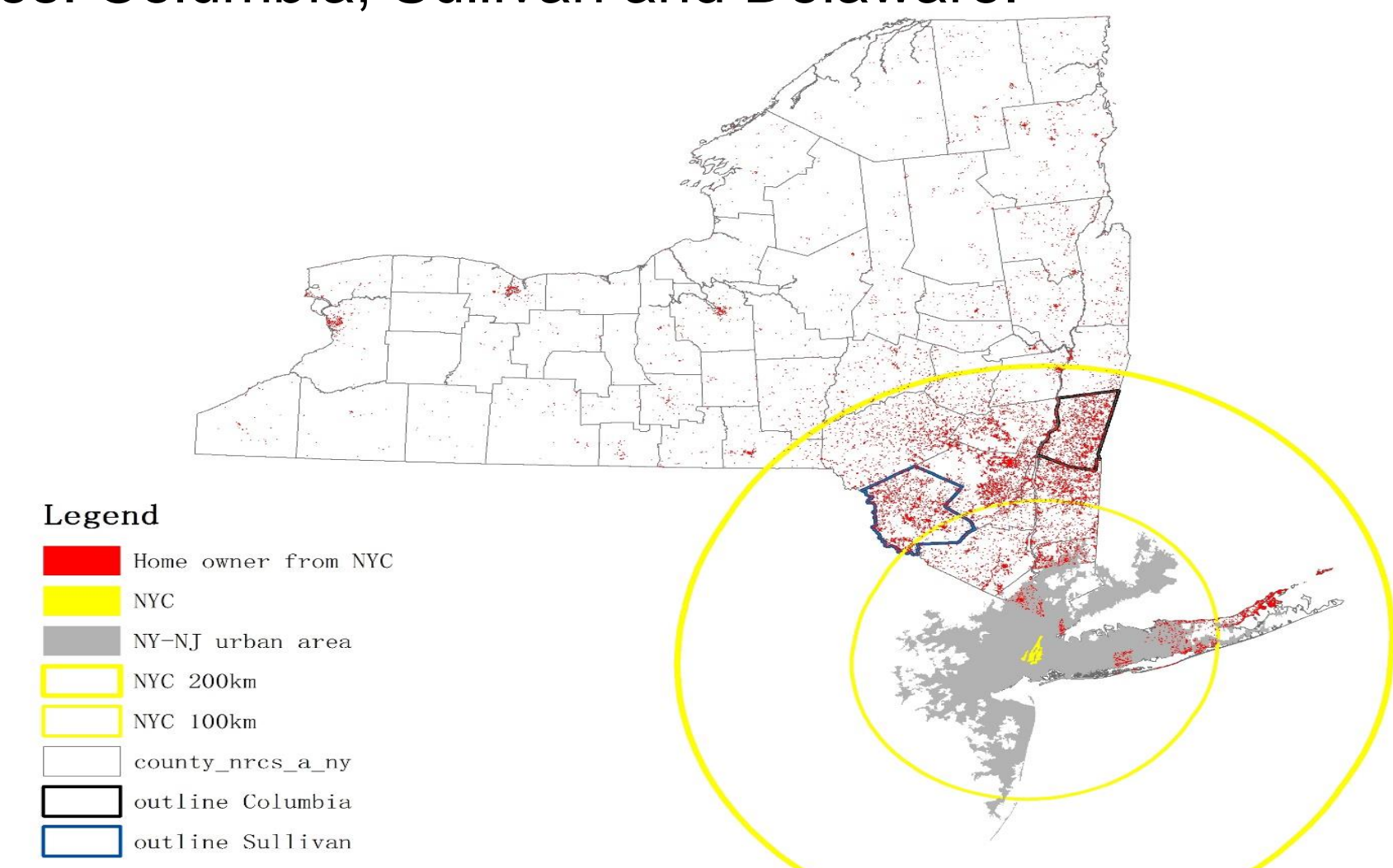
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## Abstract

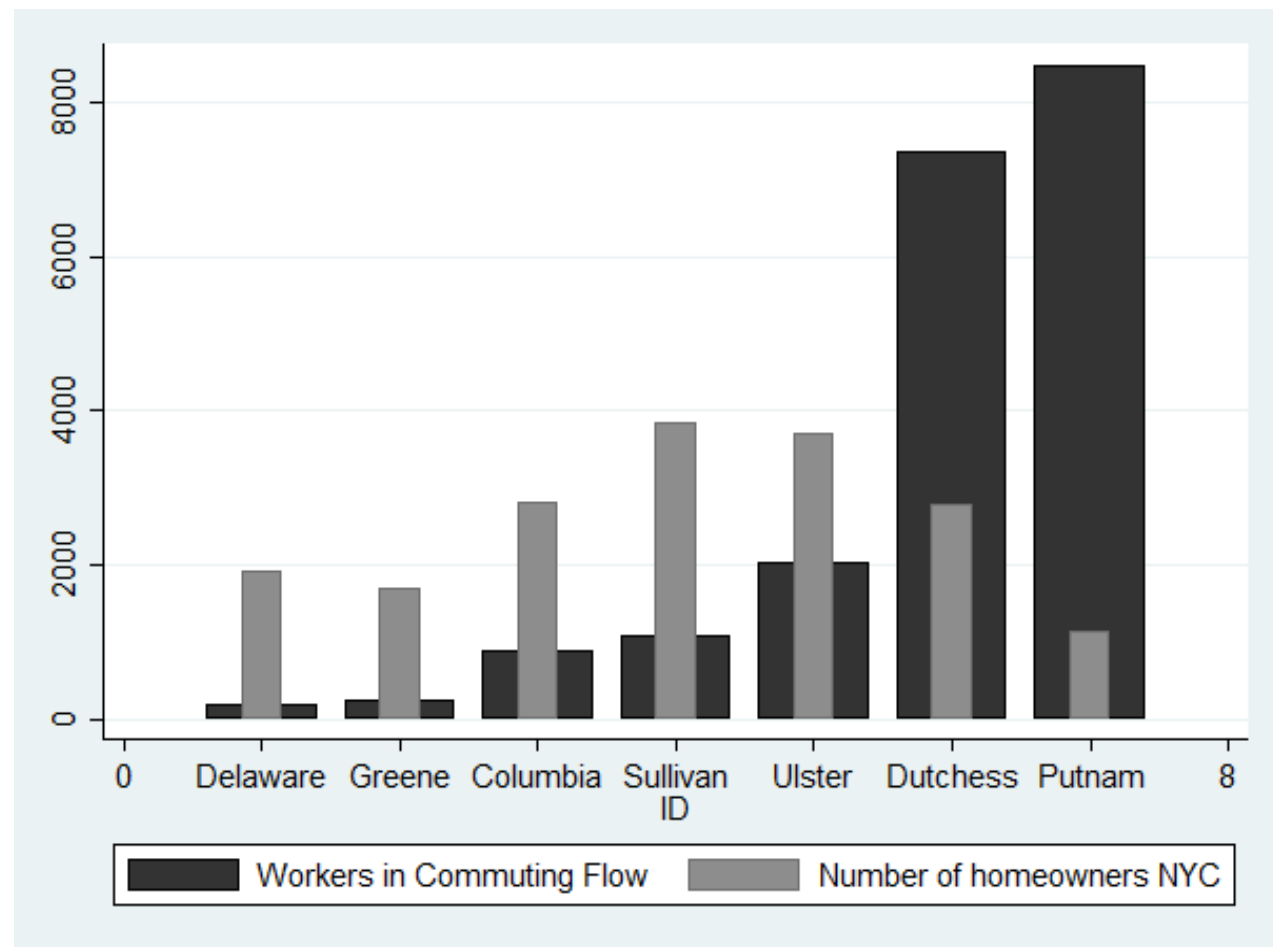
- Land-use conversion on U.S. farmland has become an important policy issue since 1970s. Much research has been done on urban sprawl and farmland, and many policies, like agricultural preferential taxes, have been taken to deal with farmland conversion. However, the threats to farmland does not necessarily through farmland loss, the prevalence of less-intensively farmed farmland is a less noticeable but potentially more serious problem.
- As the migration from rural to urban is undergoing, recreational or amenity rural areas have been experiencing a population growth. Both trends may result in such kind of ownership in urban adjacent areas that urbanites own second homes and pay local property taxes in rural areas with high natural amenities. We call this kind of ownership “recreational second-home ownership”. Properties with easy access to high amenities as well as agricultural preferential taxes are among the best choices for second-home buyers.
- Agricultural preferential tax policies provide tax credits, partial or full tax exemptions based on the usage of agricultural land, which is intended to protect the farmland from converting. But these policies may backfire in the emerging new rural-urban interface, by giving agricultural second-home land users incentives to underutilize the farmlands.

## Second-Home Shed

According to multiple datasets, we find that recreational second-home ownership, agricultural preferential taxes and amenity values interact heavily in three counties: Columbia, Sullivan and Delaware.



Home owners from NYC and second-home shed

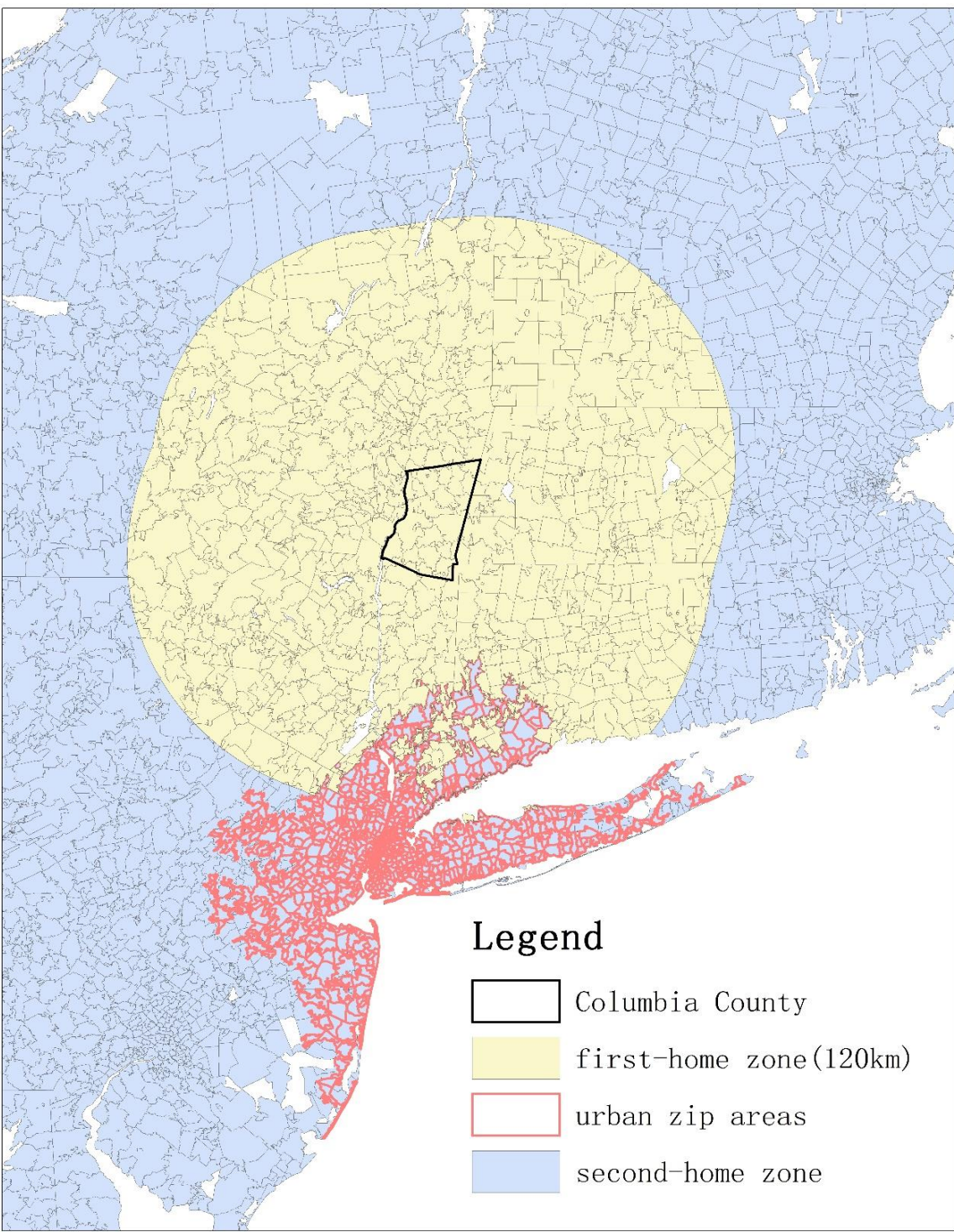


## Objectives

- quantify the extent to which the agricultural use value designation is used on non-resident agricultural lands in the second-home shed
- ascertain the magnitude of change in land use on these lands after purchase as second homes
- evaluate the loss in agricultural production caused by low efficiency of recreational-second-home farmland.

## Methods

- Based on property data, get indicator for agricultural second-home ownership.
- If the tax bill of a property isn’t sent to a zip code which is in the first-home zone, we take it as a second home. And if this property is ever used for agricultural purpose in the property dataset, we take the owner as an recreational second-home owner on farmland.



- Outcome indicator: the underutilized second-home farmland is usually used for low quality hay. Hence the outcome indicators are: Hay proportion (Hay), Other Agricultural usage proportion (AG), proportion of not using proper land for hay (Mismatch).
- Identification problem: 1. Limited data cannot provide all the information about ownership status; 2. Second homes are not randomly assigned, so does second-home transactions; 3. Dealing with the selection problem, should consider the selection based on the land cover before transaction as well as all other relevant parcel specific attributes.
- To identify the impact on land use of nonresident land owners, we focused on those parcels experienced a second homes transaction between 2006 and 2010. we investigate the land cover change difference between these farmlands and operator owned farmlands with DID-matching.

## Results(DID matching results and tests for Columbia)

Outcome: change in land cover proportion	Treatment0: Owner type change	Placebo test For Treatment0	Treatment1: farmer to nonresident	Placebo test For Treatment1	Treatment2: nonresident to farmer
ATE on AG change	-.0694*** (.0250)	.0051 (.0031)	-.1003*** (.0296)	.0094 (.0062)	-.0070 (.0379)
ATE on mismatch change	.0530*** (.0208)	-.0049** (.0024)	.0529* (.0251)	-.0081 (.0052)	.0295 (.0318)
ATE on Hay change	.0570*** (.0213)	-.0059* (.0032)	.0805*** (.0303)	-.0108 (.0068)	.0044 (.0378)
Number of Neighbors	5	5	4	4	5
Caliber	.05	.05	.05	.05	.05
Unbalanced covariates after match	No	No	No	No	No
N(treated)	98	104	66	75	31
N(control used for match)	848	1101	850	1101	852
N	946	1205	916	1176	883

Treatment0: any second home transactions (owner type change) happen between 2006 and 2010;  
Treatment1: transactions from farmer to nonresident happen between 2006 and 2010;  
Treatment2: transactions from nonresident to farmer happen between 2006 and 2010;  
Placebo test: use the treatment and control group to test Difference-in-Difference estimator before treatment (2001-2006) , which is zero as expected or indicating anticipation effects.

Robust standard errors are in parentheses; \* p<0.05, \*\* p<0.01, \*\*\* p<0.001

## Results

### DID matching results conditional on acreage constraints

Outcome: change in land cover proportion	Treatment: transactions from farmer to nonresident				
Stratify condition: Less than or equal to (acres)	No constrain	400	100	60	30
ATE on AG change	-.1003*** (.0296)	-.0992*** (.0333)	-.1361*** (.0336)	-.1531*** (.0465)	-.2655*** (.0863)
ATE on mismatch change	.0529* (.0251)	.0549* (.0314)	.0526 (.0346)	.9224** (.0382)	.1681* (.0988)
ATE on Hay change	.0805*** (.0303)	.0790** (.0304)	.9863*** (.0367)	.1321*** (.0423)	.1913* (.0988)
Number of Neighbors	4	4	4	4	4
Caliber	.05	.05	.05	.05	.05
Unbalanced covariates after match	No	No	No	No	No
N(treated)	66	65	44	41	20
N(controls on support)	849	835	602	462	309
N	915	900	646	503	329

Treatment: transactions from farmer to nonresident happen between 2006 and 2010;  
Agricultural parcels with very big acreage are less likely to be recreational second homes, so we expect large parcels tend to have smaller ATEs.  
Though all the treatment effects we get can be accepted as lower bounds, we can still conclude that recreational second-home ownership make farmland less-intensively farmed to a great extent.  
Robust standard errors are in parentheses; \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

### DID matching results and tests for Sullivan

Outcome: change in land cover proportion	Treatment0: Owner type change	Placebo test For Treatment0	Treatment1: farmer to nonresident	Placebo test For Treatment1	Treatment2: nonresident to farmer
ATE on AG change	-.0074 (.0296)	-.0005 (.0006)	-.0490** (.0210)	-.0005 (.0005)	.0720 (.1121)
ATE on mismatch change	.0317** (.0161)	.0005 (.0010)	.0562* (.0300)	.0004 (.0008)	-.0298** (.0140)
ATE on Hay change	.0099 (.0384)	.0007 (.0012)	.0360*** (.0110)	.0006 (.0010)	-.0984 (.1124)
Number of Neighbors	3	3	3	3	3
Caliber	.06	.06	.08	.08	0.05
Unbalanced covariates after match	No	No	No	No	No
N(treated)	55	58	42	45	12
N(control used for match)	334	440	333	444	329
N	389	498	375	489	341

Treatment0: any second home transactions (owner type change) happen between 2006 and 2010;  
Treatment1: transactions from farmer to nonresident happen between 2006 and 2010;  
Treatment2: transactions from nonresident to farmer happen between 2006 and 2010;  
Placebo test: use the treatment and control group to test Difference-in-Difference estimator before treatment (2001-2006) , which is zero as expected or indicating anticipation effects.

Robust standard errors are in parentheses; \* p<0.05, \*\* p<0.01, \*\*\* p<0.001

## Conclusions

- It is confirmed that underutilization or bad stewardship is the case on agricultural second-home properties.
- Some anticipation effects motivated by Agricultural district certification (2006) took place in Columbia (not in Sullivan), where we get some small effects for placebo tests.
- The underutilization problem is more likely to be caused by recreational second home ownership and more serious on parcels with smaller acreage.
- Since recreational second-owners are not for profit, they tend to claim lower rent. But instead, they are more likely to have the contract about securing their agricultural tax. So agricultural property tax policies create incentives for the underutilization behavior on the recreational second-home farmlands.
- In a word, taking everything into consideration, the lower bound of the average effects of new recreational agricultural second-home owners on the usage of their parcel: 5.5% more mismatching use for hay, 10% less area for crops in Columbia and 4.5% less area for crops in Sullivan.