

Socioeconomic Inequities in Access to Recycling Infrastructure

Northeast Recycling Council : Rethink Resource Use

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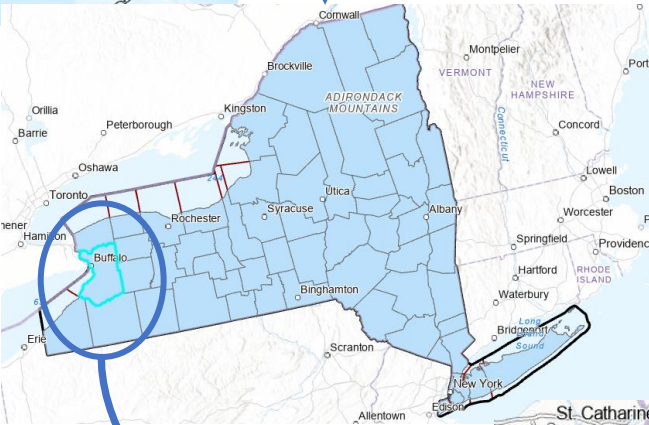
State University of New York at Buffalo

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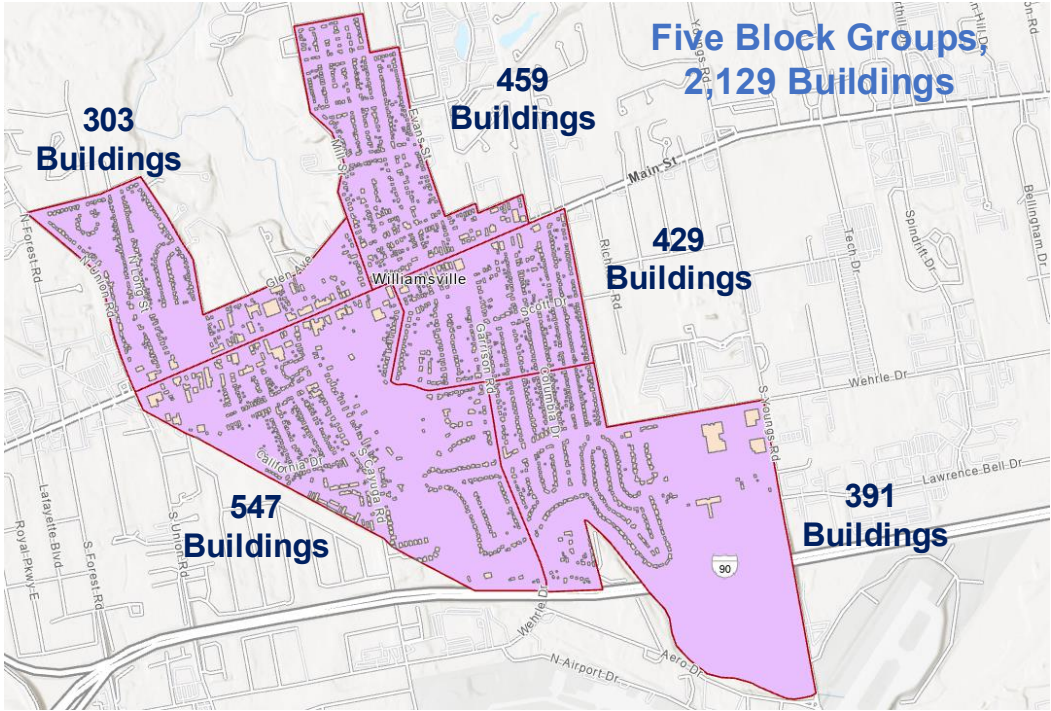
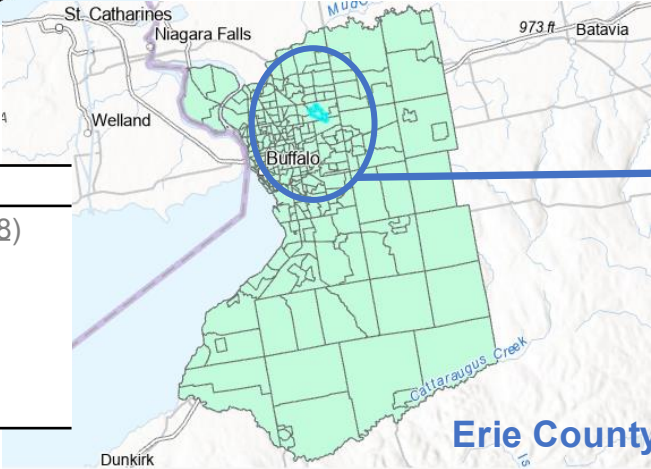
Novelty of this work: Quantifying the Inequity

1. Plastic packaging *waste generation* is stable across socioeconomic groups
2. Statistically significant relationship between MRF proximity and *plastic packaging recycling rates*
3. Communities near MRFs...
 - 26 – 40% More Household Income**
 - 14 – 19% More College-Educated**
 - 5 – 9 % Less Income Inequality (Gini Coefficient)**

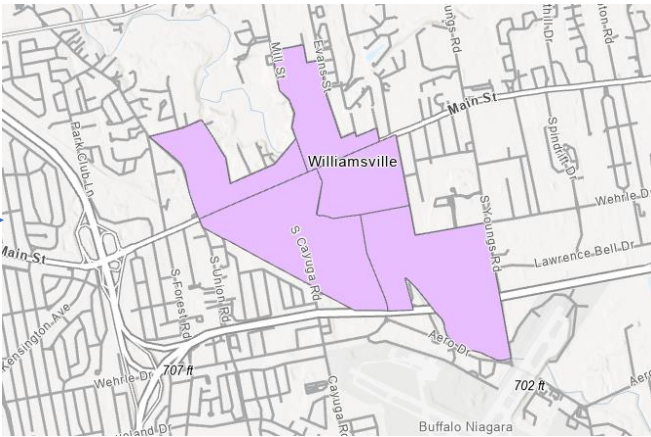
How'd We Do This?



New York State



Census Tract 89



United States has:

- 84,000 Census Tracts
- 242,000 Block Groups
- 130,000,000 Buildings

Layer	Source
Buildings	(Microsoft, 2018)
Material Recovery Facilities	(Esri, 2023b)
Plastic Recycling Facilities	(Esri, 2023b)
US Population, Block Groups	(Esri, 2023d)
US Socioeconomic Demographics, Tracts	(Esri, 2023a)
US State Boundary	(Esri, 2023c)

Wealthier, more educated states recycle more, but do not necessarily generate different plastic packaging waste

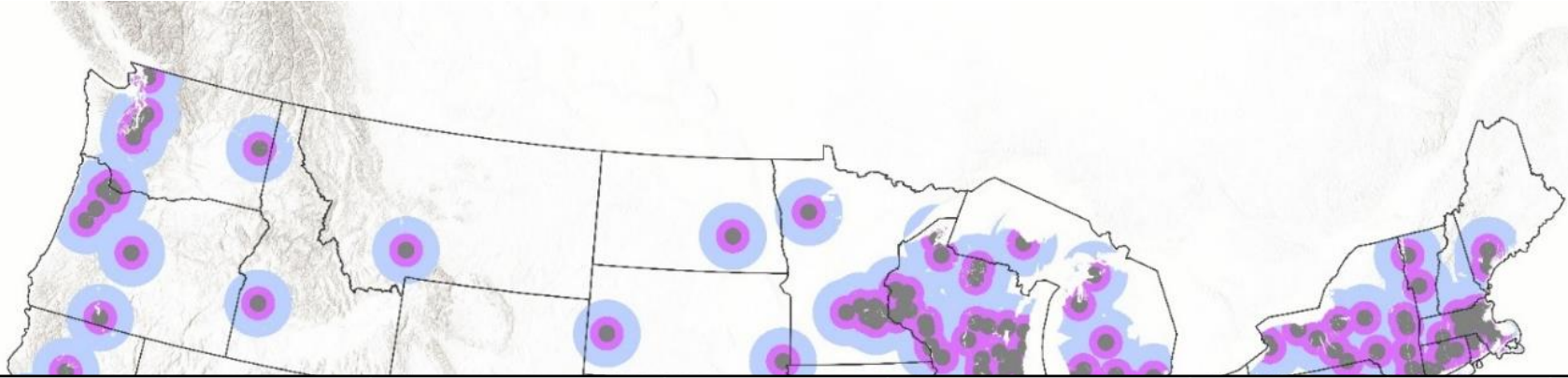
Indicators	Pearson Correlation Coefficient		P-value	
	PPWG	PPRR	PPWG	PPRR
Average Household Income	0.284	0.500	0.048	0.000
College-educated (%)	0.094	0.446	0.523	0.001
Gini Index	-0.012	-0.430	0.936	0.002
Per Capita Income	0.272	0.497	0.059	0.000
Socioeconomic Status Index	-0.052	0.260	0.723	0.071
Wealth Index	0.231	0.549	0.110	0.000

PPWG = Plastic Packaging Waste Generation
PPRR = Plastic Packaging Recycling Rate

Larger P-values =
No Statistical Significance

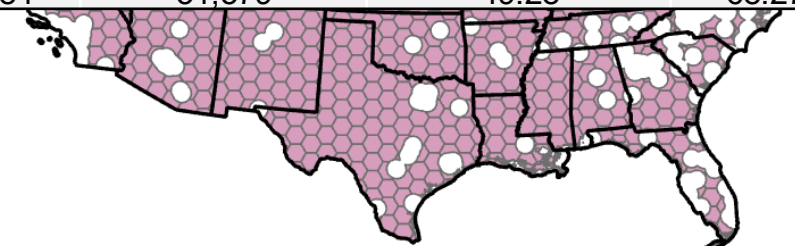
Smaller P-values =
Statistically Significant

MRF Buffers vs. NoMRF Areas



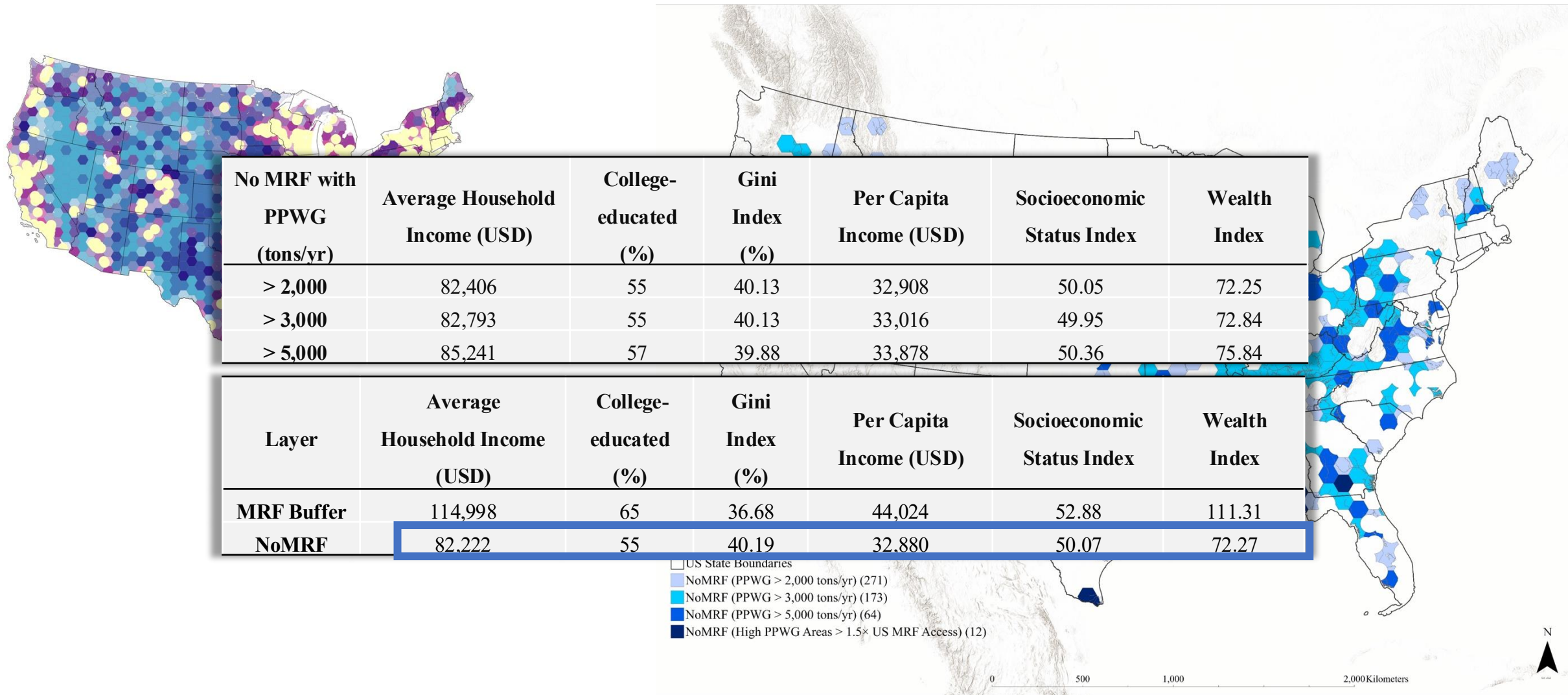
Access Radius (km)	Layer	Total Population	Land Area (sq km)	Average Household Income (USD)	College-educated (%)	Gini Index (%)	Per Capita Income (USD)	Socioeconomic Status Index	Wealth Index
25.19	MRF Buffer	200,432,797	548,432	117,207	66	36.64	44,897	52.51	112.65
	NoMRF Area	128,755,931	7,162,839	92,748	58	38.74	36,268	51.84	86.82
50.38	MRF Buffer	255,293,737	1,538,027	114,998	65	36.68	44,024	52.88	111.31
	NoMRF Area	73,895,470	6,173,323	82,222	55	40.19	32,880	50.07	72.27
100.76	MRF Buffer	298,380,074	3,574,731	110,553	64	37.12	42,549	52.56	106.09
	NoMRF Area	30,809,345	4,136,793	79,429	54	40.84	31,579	49.28	68.27

□ US State Boundaries
 ■ MRF Buffer (Radius= 25.19 km)
 ■ MRF Buffer (Radius= 50.38 km)
 ■ MRF Buffer (Radius= 100.76 km)



1,091 polygons identified as NoMRF areas

This model can be used to more equitably site future MRFs



Conclusions

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Geospatial analysis reveals socioeconomic inequities in access to recycling infrastructure in the United States

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communications sustainability

Thank You!

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