



Waste Composition in New York State: 2022 Sampling Results



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Department of Technology and Society

Stony Brook University – College of Engineering
and Applied Sciences

Flagship of the State University of New York

(64 campuses, 1.3 million students)

Degrees:

BS (Tech Systems Management)

MS (Technological Systems Management)

(Online and FTF)

PhD (Technology, Policy & Innovation)



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What do we do?

Sort Garbage into 40 different categories
3 samples per day for a week weighing up
to 1/2 metric tons



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Major Category	Subcategories
Paper	ONP OCC (not waxed, no pizza boxes, no egg cartons) Waxed-pizza-egg carton OCC Boxboard Other recyclable paper Other paper
Glass	Dep. glass containers Other glass containers Glass fragments Other glass
Ferrous-bimetal	Ferrous containers Other ferrous (not recyclable)
Aluminum	Dep. alum. containers Other alum. Containers Aluminum foil Other aluminum (not recyclable)
Other non-ferrous metal	
Plastics	Dep. #1 containers Other #1 containers #2 containers natural #2 containers colored #5 plastic containers Black plastic containers Other plastic containers Rigid plastic Plastic film Other plastics
Rubber & leather	
Textiles	
Wood	
Food	
Yard Waste	
Other organics	
Other inorganics	
Electronic-containing wastes	
HHW	
Fines	

Set up and Process



Examples



Other Plastic



Other Paper



Food



Locations of Sampling Events Based on Sample Type

MSW

Single Stream Recyclables

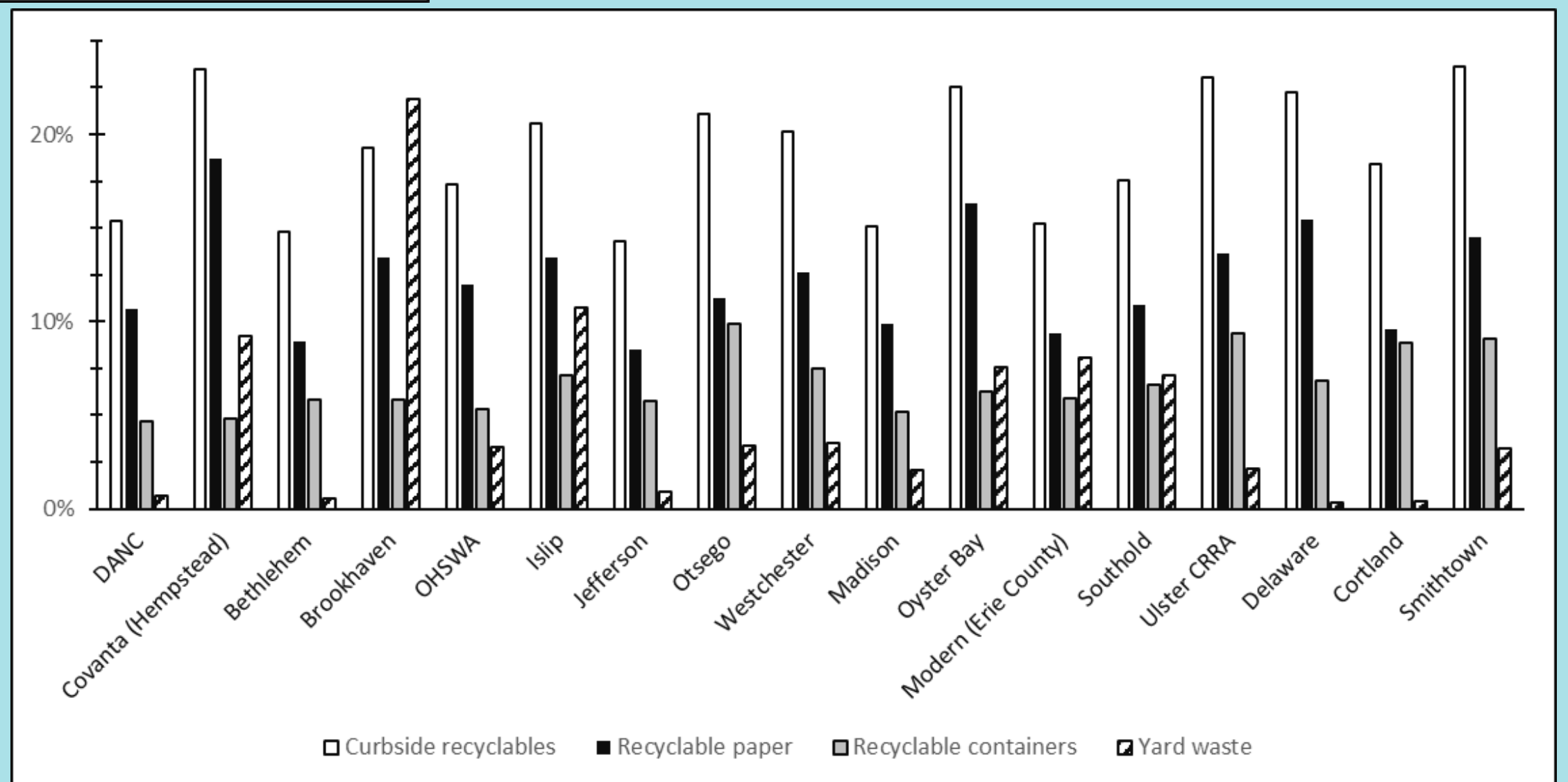
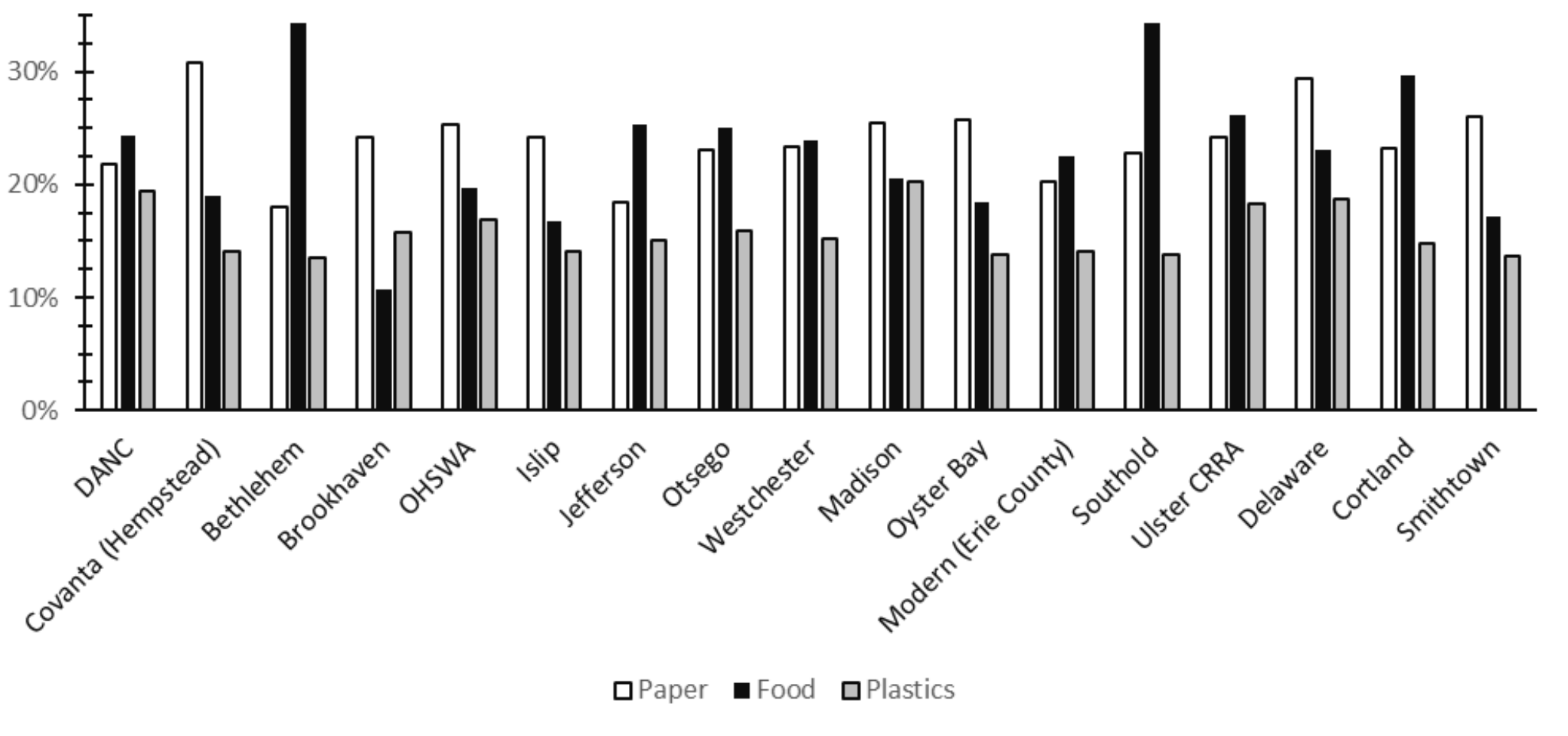
Paper Recyclables

Container Recyclables

2022 NY Solid Waste Data

Item	Weight (Kilograms)
MSW	21,527.5
Single Stream	4,140.3
Container Recyclables	2,815.4
Paper Recyclables	5,766.2
Special Product Sort	136.9
Total: 34,386.3	

MSW



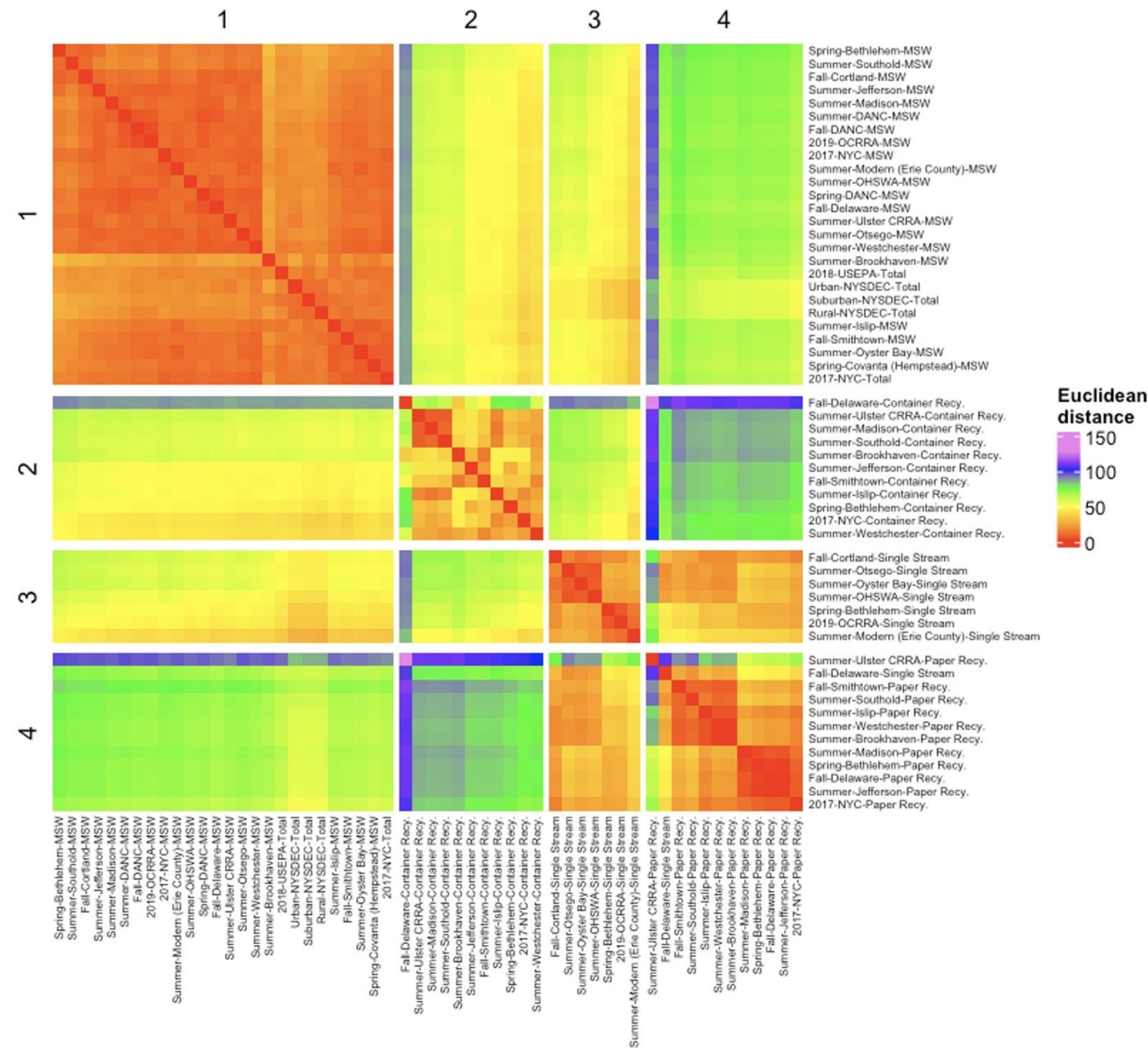


Multivariate Analysis: Heat Maps and Clustering

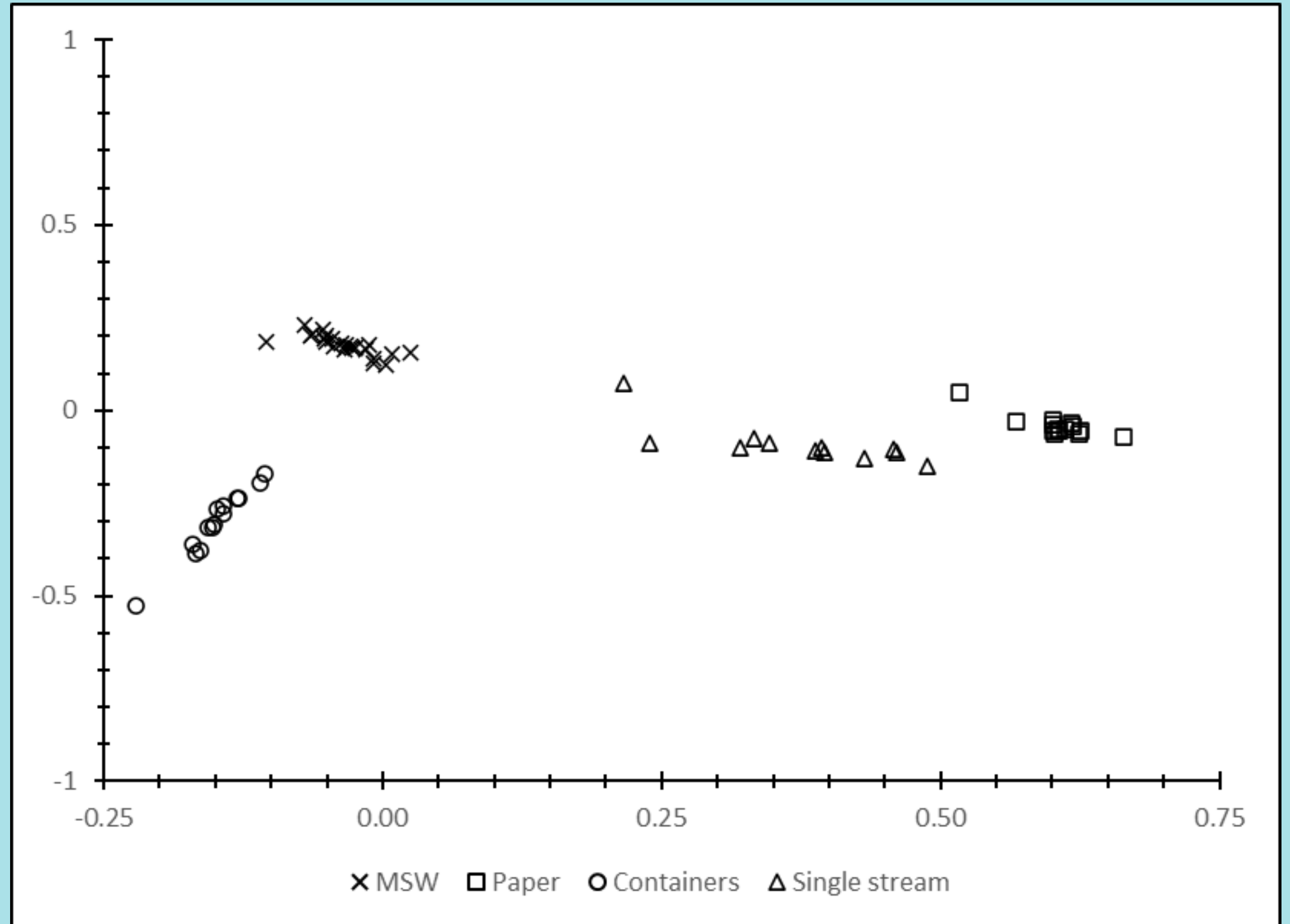
1. Calculate means for each sampling location
2. Reduce the variables from 40 to 16
3. Calculate Euclidean distances (16-D space)
4. Create heatmaps (red to blue)
5. Do other statistical analyses
6. Interpret patterns



New York State Solid Waste Clusters



PCA for New York State Solid Waste Stream Type



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The opinions, findings, and or interpretations of data contained therein are the responsibility of the University and do not necessarily represent the opinions, interpretations or policy of the New York State Department of Environmental Conservation.

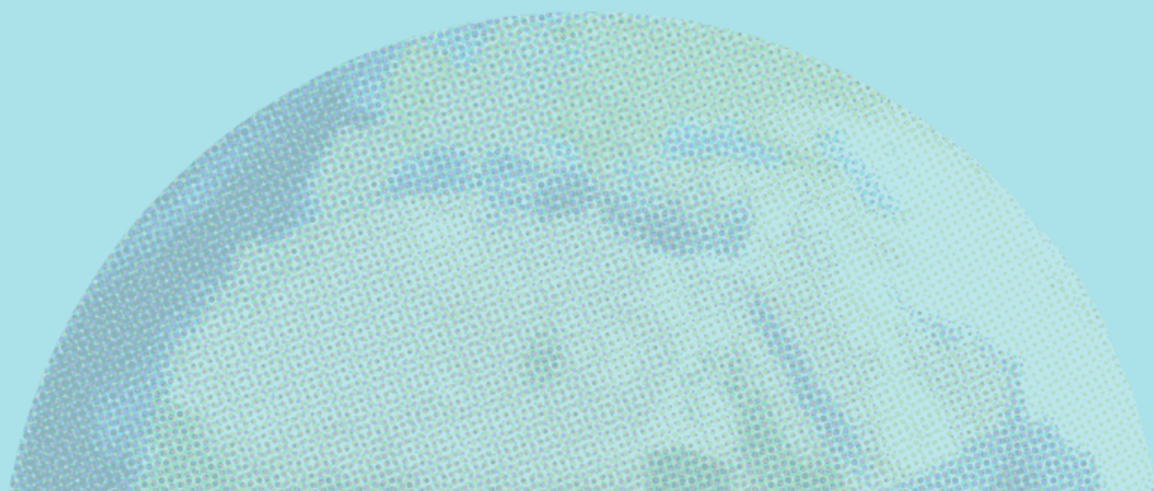
Thank You!

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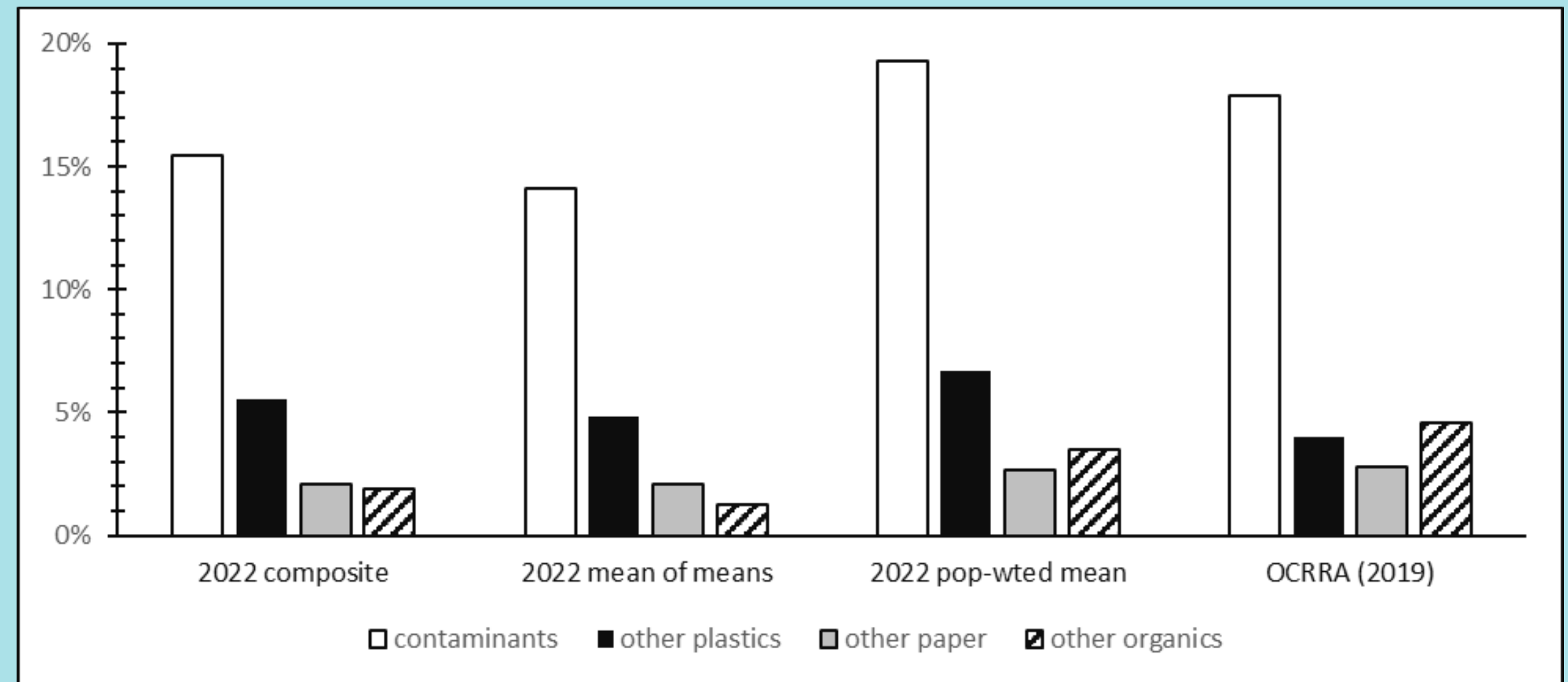
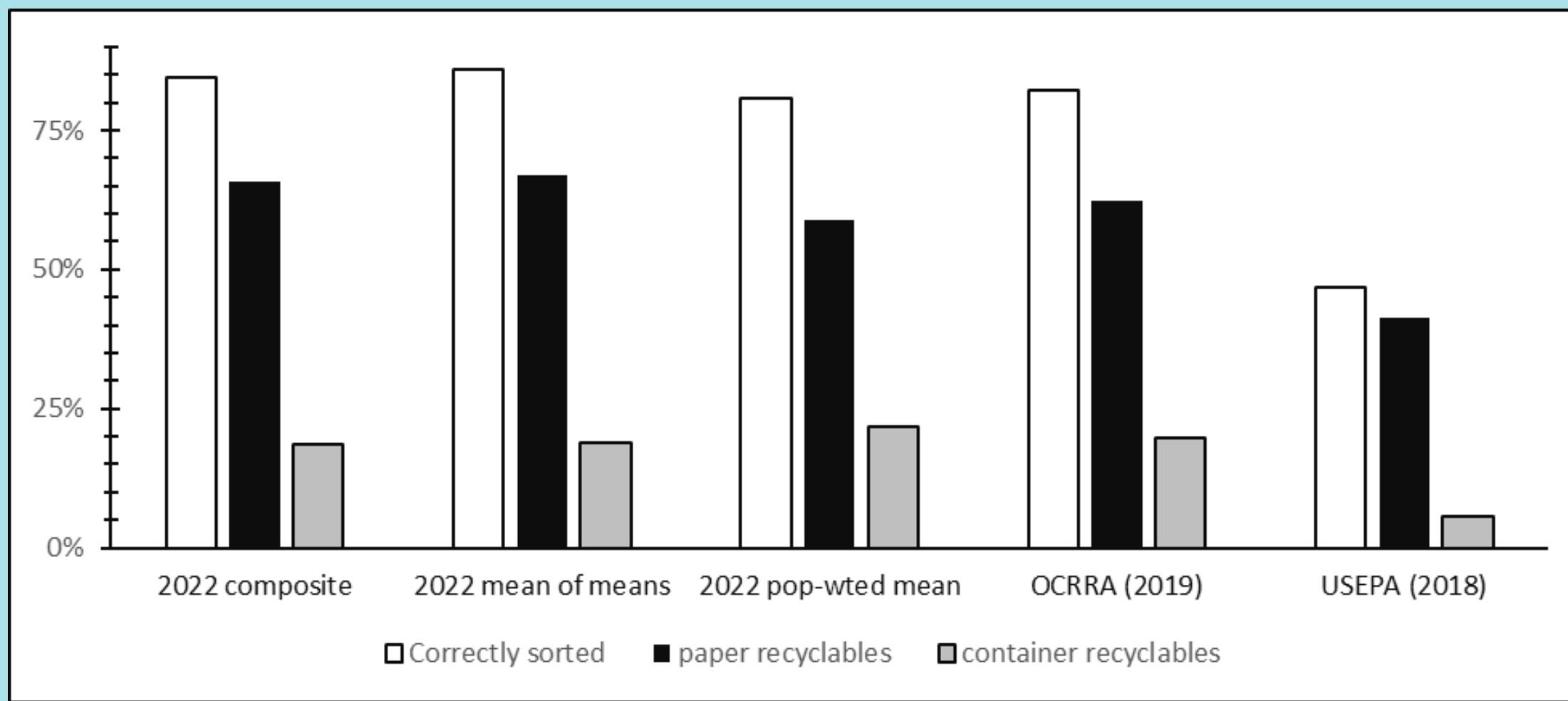


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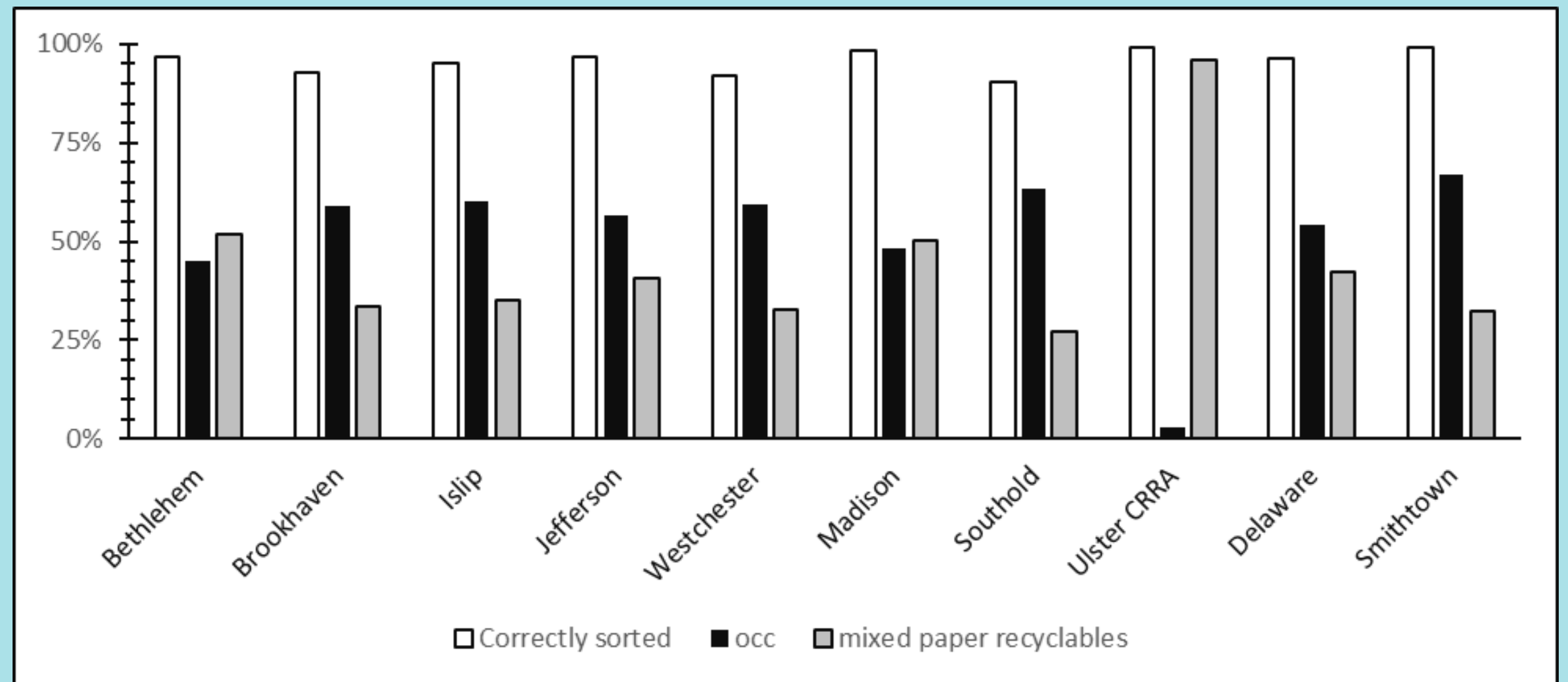
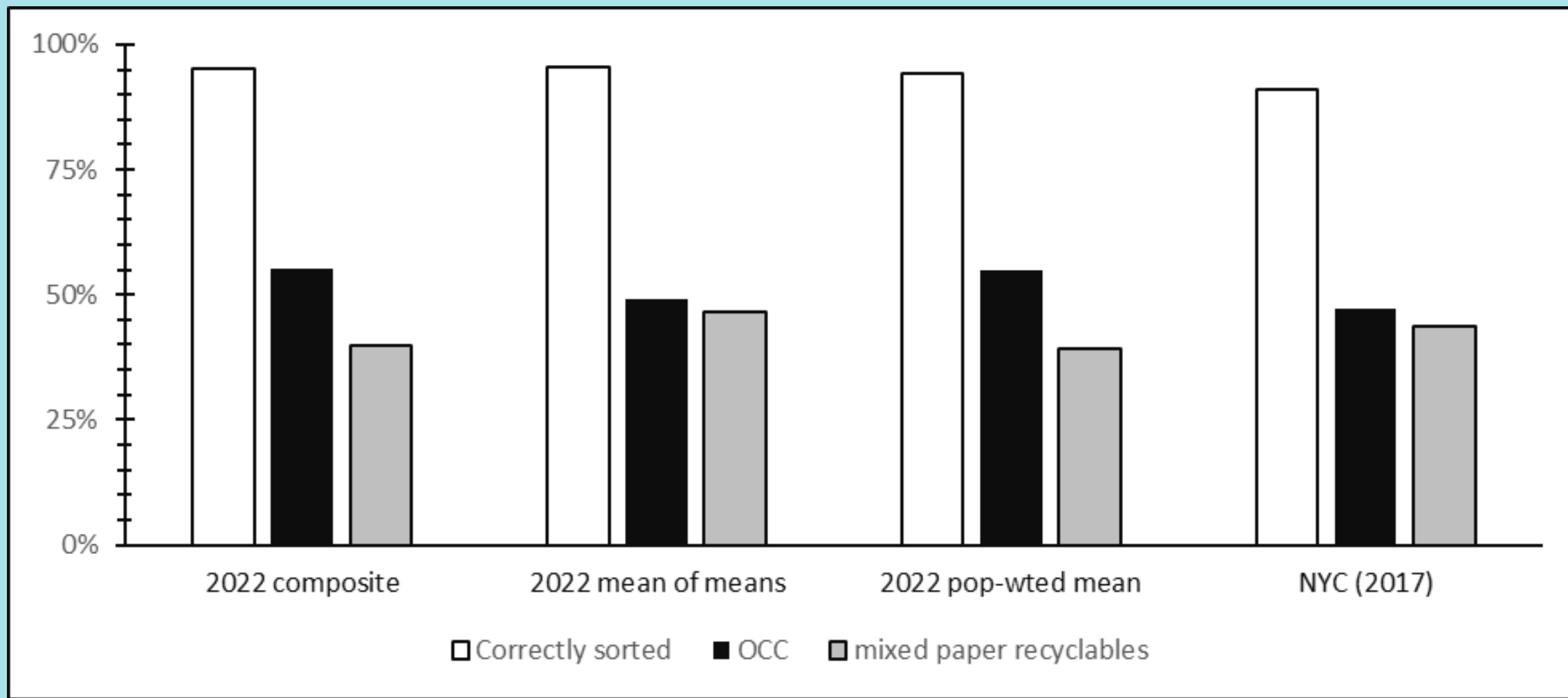
Appendix



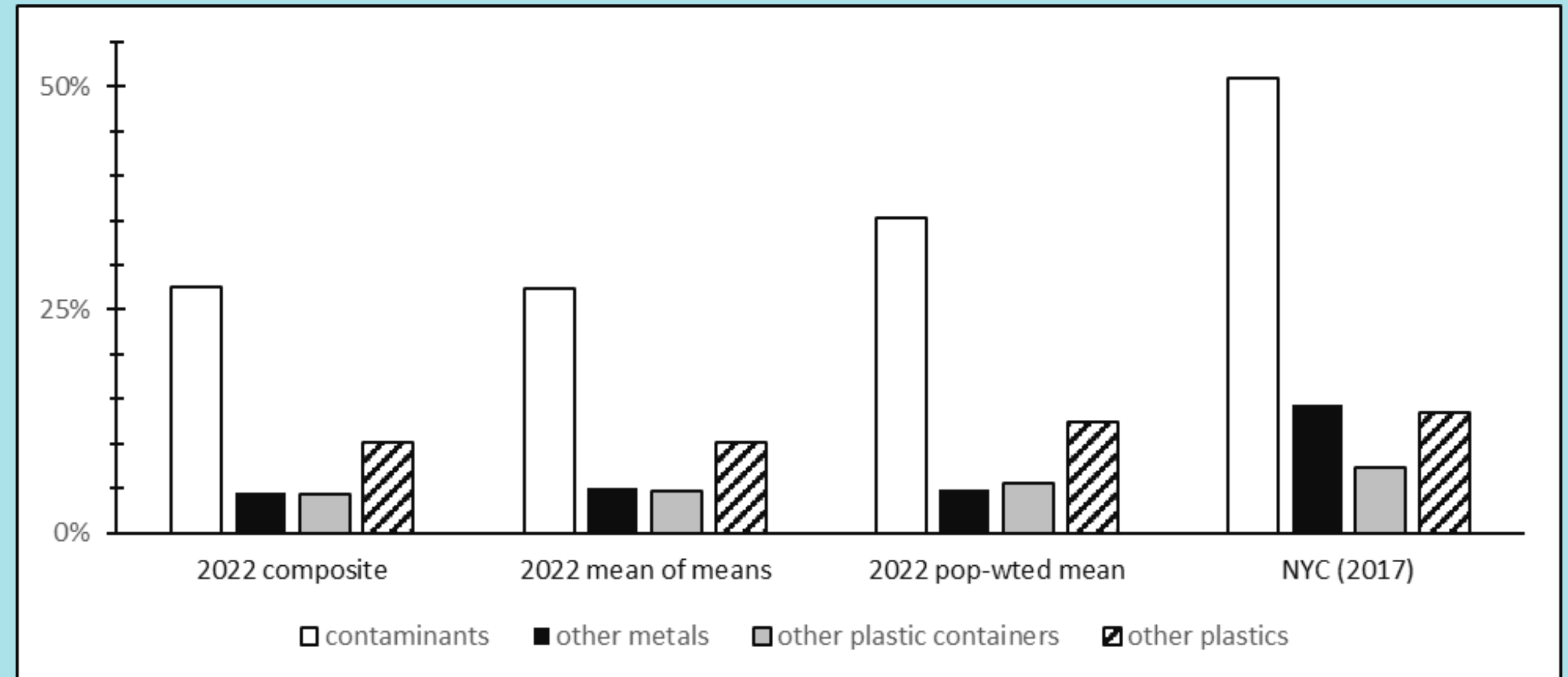
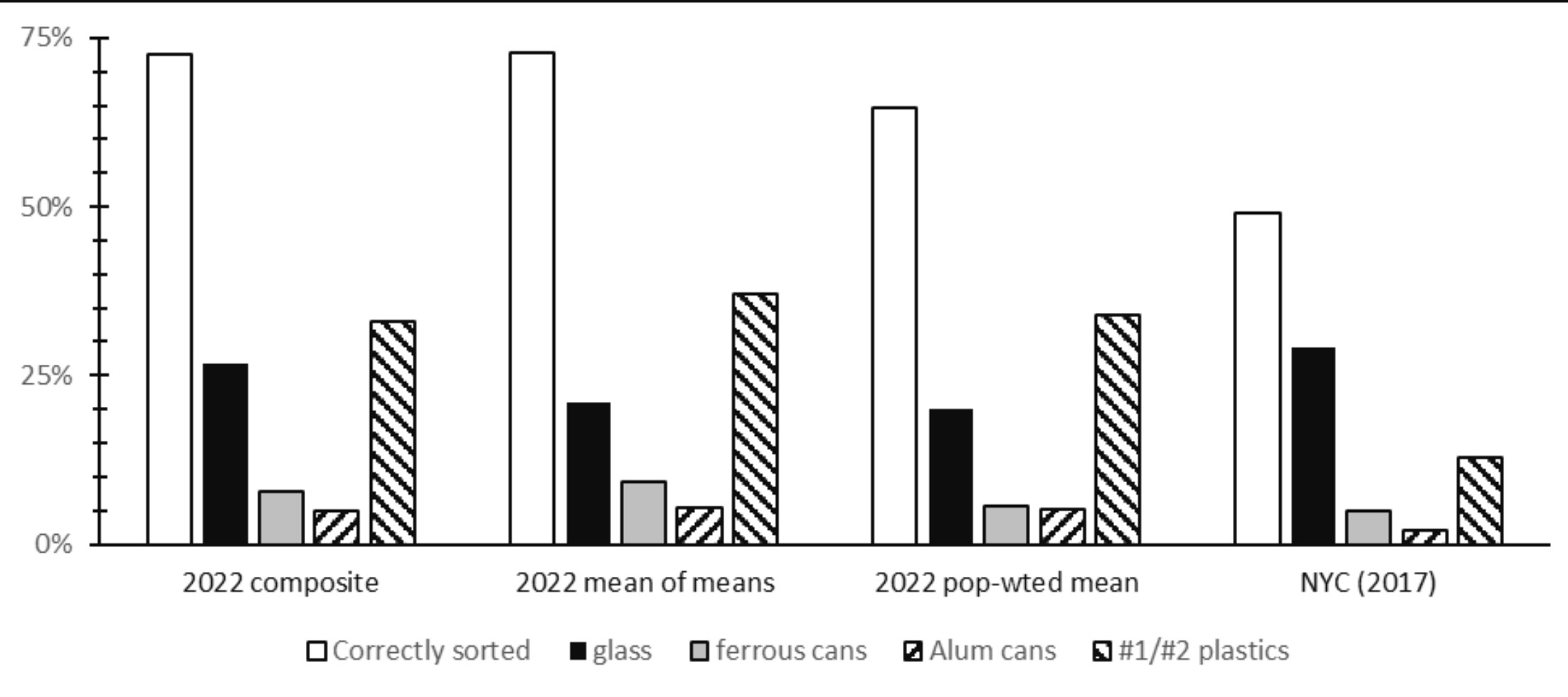
Single Stream



Paper Stream



Container Stream



40 Variable
reduction to
16 Variables

Consolidated categories	Sort categories
OCC	OCC
Other recyclable paper	ONP, boxboard, brown paper, glossy paper, office paper, junk mail, other comm'l printing, shredded paper, other recyclable paper
Other paper	Compostable paper, non-compostable paper, other paper, gable-top cont.
Recyclable glass	Dep. glass cont., wine-liquor bottles, other glass cont., glass fragments
Other glass	Other glass
Ferrous cont.	Ferrous cont.
Alum. cont.	Alum. cont., dep. alum. cont., other alum. cont., alum. foil
Other metals	Other ferrous, other alum., auto batteries, other non-alum., other non-ferrous
#1/#2 cont.	#1 cont., #1 dep. cont., #1 wine-liquor cont., #1 other cont., #1 clamshells, #2 cont., #2 cont. natural, #2 cont. colored
Other plastic cont.	(#2, #3, #4, ##6, #7 cont.) (#3-#7 cont.), (#4, #5 cont.), #5 cont., #5 cont. & lids, #6 cont., #7 cont., #3 lids, #4 lids, #5 lids, #6 lids, other lids, other plastic cont.
Other plastics	Black plastics, rigid plastics, retail plastic bags, other plastic film, other plastics
Textiles	Textiles
Food	Food
Yard wastes	Yard wastes
Other organics	Rubber-leather, wood, other organics, other (USEPA)
Other inorganics	Other inorganics, rechargeable batteries, HHW, other (NYSDEC)