



Auburn University

Influencing Recycling Behavior: A Study of Contamination Trends and Educational Messaging at University Residence Halls

Contact Information

Cassidy Hartog, Specialist, Outreach/Education, Waste Reduction and Recycling Department, Auburn University, clh0179@auburn.edu, 334-752-3298

Joan Hicken, Manager, Waste Reduction and Recycling Department, Auburn University, jlh0067@auburn.edu, 334-740-4847

Focus of Case Study

Auburn University's Waste Reduction and Recycling Department (WRRD) audited recycling contamination levels in residence hall recycling bins and created posters to educate students on contamination.

Detailed description of campaign/effort

Auburn University's 21 residence halls are home to approximately 3,600 students. From January 16 through March 23, WRRD conducted weekly contamination audits at residence hall recycling locations. Contamination levels for each bin were estimated visually based on surface contaminants, and primary contaminant types were recorded. This information was used to create educational posters for each location. The posters identified the most common contaminant and how to properly dispose of it. The goal of this initiative was to educate students on common recycling contaminants and measure whether contamination decreased over time through this targeted campaign.

Paper, Cardboard, and Plastics/Metals Recycling

The university operates a source-separated recycling program for mixed paper, cardboard, and plastics/metals. Each residence hall is equipped with designated bins for recycling mixed paper and plastics/metals, along with a cardboard recycling dumpster. While many locations have one of each bin type, some provide multiple bins. In those areas, contamination was assessed for each bin, and average contamination rates were calculated and recorded by bin type.

Audits and Posters

WRRD collected data weekly over a seven-week period at all residence hall (Village, South Donahue, Hill, Quad) recycling locations. Data for the Quad locations was collected in part by a senior sustainability capstone class through a collaborative partnership. Audits were conducted each Monday. Based on the results, one primary contaminant was identified for each bin type at each location, and customized posters were created and installed by Wednesday of the same week. For example, if styrofoam was identified as the primary contaminant in a

plastics/metals bin, the corresponding poster displayed images of styrofoam and directed users to throw it away. Posters remained in place until a new primary contaminant was identified, at which point they were replaced with updated messaging. The week of February 16 was omitted due to scheduling constraints, and the week of March 2 was excluded due to residence hall closures for spring break.

Planning steps & timeline to implement

- January 2026
 - Gathered materials
 - WRRD began audits and poster applications the week of January 16
 - Capstone class began Quad audits and poster applications
- February 2026
 - WRRD continued audits and poster updates as needed
 - No audits were conducted during the week of February 16
 - Capstone class completed their Quad audits and poster applications
- March 2026
 - WRRD resumed Quad audits; capstone class provided January and February data to WRRD
 - WRRD continued all other audits and poster updates
 - No audits were conducted during the week of March 2 (spring break)
 - Audits completed during the week of March 23

Resources and stakeholders involved

Budget

- Materials owned by WRRD
 - Printer, laminator, lamination sheets, tape

Stakeholders and Support

- Waste Reduction and Recycling Department
 - Staff completed recycling audits and poster creation
- Sustainability 5000 Capstone course
 - Dr. Miriam Wyman, Lecturer, Academic Sustainability Program
 - Waste/Recycling Audit Group Members
 - Messina Bombara, Brysen Calvin, Shelby Johnson, India Joiner
 - Assisted with recycling audits and poster creation for the Quad residence halls

Results of this campaign component

The contamination posters enabled WRRD to deliver targeted, accessible recycling guidance to residence hall students. To evaluate changes over time, contamination trends at each recycling station were analyzed using the Mann–Kendall Test in R, a method for detecting trends in time-ordered data without assuming a specific distribution. Each bin type within each residence hall was treated as a short time series. Across all locations and bin types, no statistically significant trends in contamination were detected during the study period. However, primary contaminants shifted frequently across locations. While these changes cannot be directly attributed to the posters, they may indicate some responsiveness to the targeted messaging.

Although overall contamination did not significantly decline, the findings highlight opportunities to refine both the intervention and evaluation approach. Extending the study period or combining posters with additional engagement strategies may provide clearer insights into their impact. Overall, the results suggest that contamination patterns are complex, and targeted communication tools such as posters may still influence specific recycling behaviors.

What would you do differently in the future?

- Establish a control group where no posters were created and the contamination was tracked; this would allow for a better baseline to compare and evaluate the impact of the posters
- Extend the length of audits from 7 weeks to 12 weeks to have a better view of trends over time
- Survey residents in each hall to gather feedback on the effectiveness of the posters

What advice would you give to another college that wanted to do a similar effort?

- Have the same individual auditing contamination each week; ensure they are well trained in identifying and estimating contamination to minimize variability in results
- Set a consistent schedule to do audits and poster updates; determine a routine that works best for your operation and adhere to it; for example, Monday audits and Wednesday poster updates worked best for our study
- Keep the signage simple; target the primary contaminant at each location to maintain clarity and avoid overwhelming the audience

Photos and graphics:



Performing contamination audits



View inside plastics/metals recycling bins with minimal contamination



Poster examples



Applying posters to bins

			2/4/2026			2/11/2026			
			% Contaminated	Main Contaminants	Poster(s)	<-- Improved?	% Contaminated	Main Contaminants	Poster(s)
4	Boyd Hall	Plastic and Aluminum 1	20%	Boot Covers Paper-Cups Plastic Bags <u>Styrofoam</u>	Styrofoam Cups	Yes	10%	Glass Jar Plastic Film	Plastic Film
5		Mixed Paper 1	85%	Plastic Bags Paper-Plates <u>Styrofoam</u> Aluminum Cans	Styrofoam Cups	Yes	25%	Shoe Covers Styrofoam	Styrofoam Cups
6		Cardboard 1	35%	Paper Cups <u>Styrofoam</u> Cups	Styrofoam Cups	Yes	5%	Plastic Film Styrofoam	Styrofoam Cups
7	Sasnett Hall	Plastic and Aluminum 1	40%	Glass Bottles Paperboard Glass Jar Trash Bag	Glass	No	70%	Food Wrappers Paper Cups&Plates Plastic Film Cardboard	Paper Cups & Plates
8		Mixed Paper 1	75%	Wrappers Bubble Mailers <u>Cardboard</u> Paper Plate Aluminum Can	Cardboard	Yes	25%	Plastic Film Styrofoam Cardboard Glass	Cardboard
9		Cardboard 1	20%	<u>Food Wrapper</u> Aluminum Foil	Plastic Wrappers	Yes	5%	Aluminum Foil	Plastic Wrappers

Contamination audit tracking sheet example; primary contaminants underlined for each bin type

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> summary(MannKendall(boyd_data))
Score = -6 , Var(Score) = 43.33333
denominator = 20.4939
tau = -0.293, 2-sided pvalue =0.44752
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Example of Mann-Kendall test for Boyd residence hall mixed paper recycling bins. P value indicates that there is not sufficient evidence to prove that the contamination rate changed steadily over time.