RECYCLING at CAROLINA

JULY 2010 through JUNE 2011



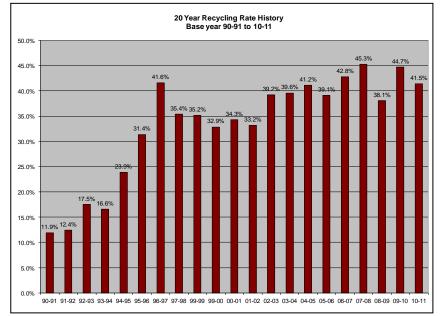
Last fiscal year marked 20 years of waste disposal and recycling reporting for Carolina. Between July 1990 and June 1991, our recycling rate was 11.9%. This past year we reached a 41.5% recycling rate which kept 4,084 tons of materials out of the landfill and circulated those materials back into the manufacturing world for reprocessing into new products.

In addition to minimizing landfill use and practicing sustainable materials management, our recycling and composting programs reduced greenhouse gas (GHG) emissions by 35,815 MTCO₂E and reduced energy use by 249,642 BTUs. (1) This is equivalent to reducing emissions from 6,560 passenger vehicles and conserving the annual energy use of

2,327 households, 187 railway cars of coal, 43,042 barrels of oil, and 2 million gallons of gasoline. The chart to the right shows savings from paper recycling on campus in terms of campus equivalents.

Other important savings to consider are financial and social. Recycling saved the University almost \$200,000 in avoided landfill tipping fees and \$1 million in avoided collection fees. (2) Cardboard and confidential paper recycling revenue offset recycling costs by almost \$61,000.

The social ramifications of Carolina's recycling program include developing recycling habits and behaviors in our future leaders, participating in a community that highly values recycling and environmental and social stewardship, and supports the job market by employing workers along the entire scope of recycling from education, data collection, customer service, materials collection, transportation, processing and remanufacturing. At Carolina alone there are seven service contractors and their employees, seven permanent University employees directly associated with waste management, four student employees, four temporary employees, and numerous volunteers and individuals who have recycling and waste management as a portion of their job duties.





⁽²⁾ Avoided landfill fees are calculated by multiplying the tons recycled by the landfill tipping fee. The avoided collection fees are calculated by multiplying the tons recycled by the difference in the cost per ton of trash and recycling handling and disposal/processing.

⁽¹⁾ GHG emissions and energy reduction figures were calculated using the EPS's WARM program which takes into consideration a life cycle analysis for the different materials recycled or composted. Because they take into account the life cycle of materials, these savings occur over a period of time and not in a single year.

Points of interest for 2010-2011:

1. Campus recycling statistics

- a. RecycleMania
- b. Amounts Collected
- c. Environmental Savings
- d. Financial Savings
- e. Social Contributions

2. Events

- a. America Recycles Day
- b. Earth Day
- c. FallFest
- d. Student Move-In
- e. Student Move-Out

3. Partners and programs

- a. Composting
- b. Housing and Residential Education
- c. Rameses Recycles
- d. Waste Assessments

Office of Waste Reduction and Recycling

(919) 962-1442 go.unc.edu/recycling

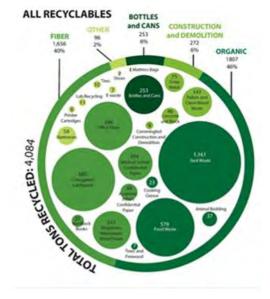


1. Campus recycling statistics

a. 5th in RecycleMania for overall recycling totals

b. Amounts Collected

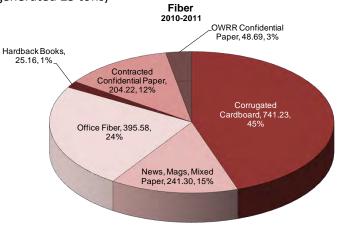
- 1,242 customer requests and service orders per year
- Recycling rate 41.5%
 - o 4,084 tons recycled
 - o 5,764 tons landfilled
- Per capita information
 - Nearly 300 pounds per person landfilled, increase of 30 pounds per person
 - o 200 pounds per person recycled
- Overall waste changes from FY09-10
 - Recycling total down 2%
 - Total waste generated up 6%
 - Recycling rate down 7%
- Orange County landfills
 - UNC only sent 2.5 tons of waste to the MSW (Municipal Solid Waste) landfill at Orange County
 - o 116 tons to the C&D (Construction & Demolition) landfill
- Organics
 - o Total up 4% even with elimination of animal bedding composting
 - Food waste up 23%
 - 71% recycling rate for Rams Head
 - 67% recycling rate for Lenoir
 - Yard waste up 79%



- Fiber (cardboard, office paper, mixed paper, hardback books)
 - As a whole, down by 11%
 - Cardboard amounts down by 10%
 - o Cardboard revenue up from \$39,000 last FY to \$55,000 in FY10-11
 - Confidential paper down 22%
 - Hardback books up 200% (library renovations generated 25 tons)
 - Newspapers and magazines up by 2%
 - Office paper down 17%
- Bottles and cans up 14%

c. Environmental Savings

- Greenhouse gas (GHG) emissions by 35,815 MTCO₂E
- Energy use by 249,642 BTUs⁽¹⁾
- This is equivalent to reducing emissions from
 - o 6,560 passenger vehicles and
 - Conserving the annual energy use of
 - 2,327 households,
 - 187 railway cars of coal,
 - 43,042 barrels of oil, and
 - 2 million gallons of gasoline.



d. Financial Savings

- Recycling saved:
 - \$200,000 in avoided landfill tipping fees,
 - o \$1 million in avoided collection fees(2), and
 - Offset costs by almost \$61,000 with revenue from cardboard, paper, and scrap metal.

e. Social Contributions

- Developing recycling habits and behaviors in our future leaders,
- Participating in a community that highly values recycling and environmental and social stewardship,
- Supporting the job market by employing workers along the entire scope of recycling from education, data collection, customer service, materials collection, transportation, processing and remanufacturing.
- Supporting Carolina's waste management efforts:
 - o Seven service contractors and their employees,
 - FiltaFry/EcoLogic Oil Recycling
 - Brooks Contractors
 - Orange County Solid Waste Management
 - Orange Recycling Services
 - Shimar
 - Sonoco
 - Waste Industries
 - Six permanent University employees directly associated with waste management,
 - Amy Alves, Program Assistant
 - Shawn Ellis, Recycling Operations
 - Ray Lanier, Recycling Operations
 - Amy Preble, Recycling Coordinator
 - BJ Tipton, Program Manager
 - Craig Yarborough, Recycling Operations



- Student employees,
 - Kaitlin Finan, Intern (academic credit: waste assessments, outreach, special projects)
 - Will Leimenstoll, Intern (special projects/rates graphics, GreenGames)
 - Christina Lynch, Intern (Green Events)
 - Sara Rafalson, Intern (GreenGames, webpage, climate action metrics)
- Four temporary employees,
 - Ernest Moffitt, Indoor Paper Collection
 - Natalia Posthill, Recycling Coordinator
 - Gary Smith, Indoor Paper Collection
 - Alison Weiner, Intern (rates and strategic planning project)
- Numerous <u>volunteers</u> and <u>individuals</u> who have recycling and waste management as a portion of their job duties.
 - Capstone class fall 2010 (academic credit: waste assessment in three campus buildings)
 - Environmental Affairs Committee (volunteers: athletics recycling, Smith Center project, outreach and tabling)
 - Honors and APPLES program (volunteers: trained to monitor green events)
 - Sport Clubs (volunteers: tailgate recycling)

2. Events:

- a. America Recycles Day: November 15
- b. Earth Day: April 21c. FallFest: August 2165% recycling rate
- d. Student Move-In: August, 2010
 - Our busiest weekend of the year:
 - A crew of workers cleaned up around sites Friday night,
 - OWRR, Waste Industries and Sonoco worked extra hard keeping sites clean throughout the week and early in the morning Saturday and Sunday, and
 - 31 workers staffed residence hall dumpster sites Saturday and Sunday afternoons.
 - Extra containers used included:
 - Twelve 8yd cardboard containers,
 - Three 30yd rolloff cardboard containers,
 - Seven 16vd trash rolloffs and
 - Four 6yd trash dumpsters.
- e. Student Move-Out: May 2011
 - 15% recycling rate
 - o 161 cubic yards of students' reusable discards
 - No on-site sale
 - 62 tons were collected for sale and redistribution to others by
 - Habitat for Humanity Re-Store
 - Pittsboro PTA Thrift Shop
 - Durham Rescue Mission



- a. Composting
 - Nine million pounds of food waste collected since 2000





- 580 tons collected in 2010-2011
- Campus food waste composting programs:
 - Alpine Bagel
 - Carolina Inn (university building, contractor-operated)
 - Lenoir—Carolina Dining Services
 - o Rams Head—Carolina Dining Services
 - Rizzo Center (university building, contractor-operated)
 - The Beach
 - The Friday Center
 - Green Events
 - 206 faculty, staff, and students trained as certified green event coordinators
 - 46 green events in 10-11
 - Average diversion rate for events =75%

b. Housing and Residential Education

- Implemented vendor take back of packaging from bedrail project.
- We had an historic level of participation during FY10-11, mainly due to Sara Rafalson's leadership and student connections.
- Winning communities include:
 - Ehringhaus
 - o Connor
 - o Kenan

c. Rameses Recycles

- Logo was developed over the summer
- The 2010 football season's recycling efforts at Kenan Stadium and tailgate areas resulted in recycling of
 - o **16.6 tons (33,200 pounds)** of bottles, cans, and cardboard,
 - o 33% recycling rate for overall recycling at the stadium, and
 - o **A ton** (literally) of **lemons** from the last two games.
- Recycling on the concourse level of the Smith Center was implemented.
- The EPA Game Day Challenge (Oct. 30)
 - o UNC-CH ranked 20th out of 75+ schools in diversion rate,
 - 23rd in Per Capita Waste Reduction,
 - o 39th in Greenhouse Gas Reduction,
 - o 42nd in Per Capita Recycling, and
 - 7th in Organics Reduction.
- UNC won the Carolina Recycling Association Spotlight Award for its Game Day Challenge and Rameses Recycling program.
- Partners: Aramark Concessions, Athletics, Grounds Department, Parking and Transportation, Environmental Affairs Committee

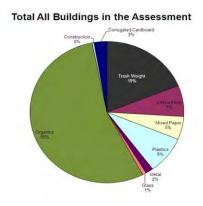
d. Waste Assessments

- A recent waste assessment from the 2010 Fall Capstone Class revealed that:
 - 28% of the office trash in the Student Union, Law School and Business School was paper, and
 - 20% of the "trash" in these buildings was recyclable in existing programs.



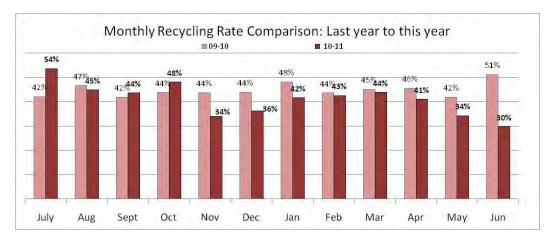






- The class calculated that if existing programs were used to their potential, Carolina could:
 - o Recycle another 1,030 tons of materials,
 - o Bring the recycling rate up to 55%.
- Based on interviews and waste audit, the class recommended the following:
 - (1) Establish a recycling goal of 55%;
 - (2) Further pursue organics capturing;
 - (3) Increase recycling of office paper, plastic bottles, and cardboard;
 - (4) Increase overall indoor recycling;
 - (5) Increase overall outdoor recycling;
 - (6) Partner with other departments to recycle niche products.
- Based on these finding, Alpine Bagel Co. began its composting program.

June 2011 Solid Waste Trend Report

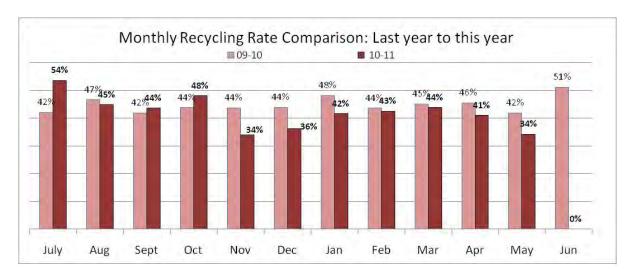


OWRR's over recycling rate for 2010-2011 is 41%. We have had several months this year with significantly lower rates as compared to last year. However, these large drops occurred in months that we would expect lower rates because students are out for the winter and summer breaks. During the month of June we had a 30% recycling rate due to a significant drop in Yard Waste numbers, explained below.

Yard waste numbers were unusually low for June. In June we began transitioning to a new method for collecting yard waste information from Grounds. Part of the change is the placement of a rolloff at Grounds for limbs and brush. Grounds workers can use this container for yard waste instead of driving to the grinding area at Carolina north. This should save "windshield time" and allow us to get actual weights vs. estimated weights from multiple individual loads. Trees and large loads of brush will continue to be taken straight to the grinding area and will still be estimated weights. We will continue to monitor and refine the data collection for accuracy.

Currently paper markets are strong. Cardboard revenue for the 10-11 FY was \$55K. While that's a lot of money, we know that there is still a good bit of cardboard ending up in dumpsters and compactors destined for the landfill.

May 2011 Solid Waste Trend Report



Our year to date recycling rate is 42%. Our recycling rate for May 2011 was 34%, while in May 2010 it was 42%. Contributing factors for a lower recycling rate this past May might be that it was student move-out and our trash totals were higher—we landfilled 150.80 tons this year at move-out compared to 120.68 tons last year. Also, we didn't recycle any block/concrete (usually around 12 tons per month). And finally, we were also in the process of changing over the way we record yard waste data from Grounds. Thus, we used a monthly average for the May yard waste figures versus actual data for May which may have been higher due to seasonal grounds keeping activities.

For food waste composting, we reached the 9 million pounds mark. Yes, we've collected 4,500 tons of food waste since 2,000 for composting by Brooks Contractors, Inc. in Goldston, NC. Campus Dining Services has embraced the compost program and has worked hard to reduce waste overall in the dining halls. Examples of this include providing reusable takeout containers and durable dining ware, limiting single serving condiments, installing food pulpers, and removing trays from the dining halls.

Student move-out continues to be our largest annual waste producing event. 150.80 tons of waste were landfilled as students left campus this year. This year, OWRR hauled 15% of this waste, saving the University and Housing \$2141.00 in hauling fees.

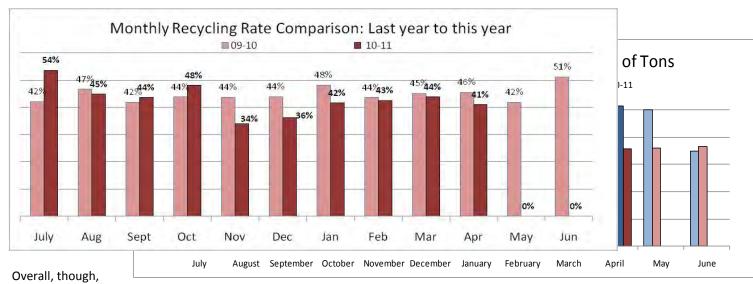
This year students' reusable discards were collected by Habitat for Humanity and the Pittsboro PTA, and the Durham Rescue Mission. And while there was no on-site sale, 161 cubic yards of stuff or roughly 62 tons were collected for sale and redistribution to others by these charities.

In April, we reported a higher than usual amount of scrap metal. Surplus property is now reporting their scrap metal numbers. In April, they reported recycling 12 tons of metal sent to be recycled.

Next month will be our year-end report. We'll have per capita waste and recycling figures for you as well as our annual recycling rate. We also hope to highlight the departments or operations that are our biggest recyclers and waste producers (by nature of their operations) and highlight a few of the individuals and departments who have gone above and beyond this year to help UNC recycle more and waste less!

April 2011 Solid Waste Trend Report

Our recycling rate for this April was 41%. That's down slightly from last April when it was 45.6%. From this statistic, one might think that we recycled less. Actually, we recycled almost the same amount--357 vs. 351 tons last year. It was our garbage that increased--by almost 100 tons.



our year to date recycling rate (43%) was down just 1% from last year. Again, our overall waste was up and we landfilled 420 tons more waste this year than last. At the same time, our recycling increased by only 4% or 144 tons.

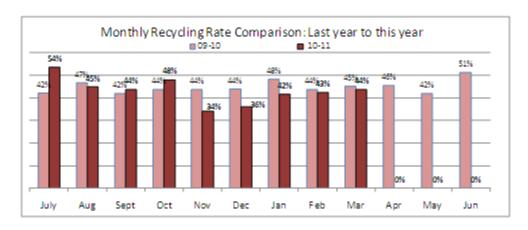
The Masonry Shop collected 12 tons of concrete and block to be recycled. Also, more than 112 tons of pallets have been recycled so far this year.

Other ways to look at our recycling results are in related savings. So far this year, just taking into consideration the paper products that have been recycled from campus this year, we've saved

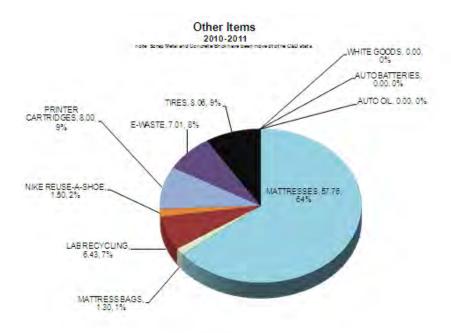
- ★ 23,922 trees
- ★ 9,784,251 gallons of water
- ★ 651,533 gallons of oil
- ★ 826,026 pounds of air pollution
- ★ 5,737,148 kilowatt hours of energy
- ★ 4,306 cubic yards of landfill space

March 2011 Solid Waste Trend Report

Carolina's recycling rate for March 2011 is 44% and 43.4% year-to-date. Yard waste continues to make up the largest percent of the overall recycling for campus at 31% (984 tons!) Cardboard comes in second at 17% or almost 550 tons. Food waste and office paper follow at 15% and 10% respectively or 467 and 309 tons each.



Figures for paper collected via the Medical School shredding contract were submitted dating back to December 2010 and totaled 52 tons or 17 tons per month. We also started receiving toner cartridge data from Central Receiving. In March, 8 tons of toner cartridges where shipped for refill.

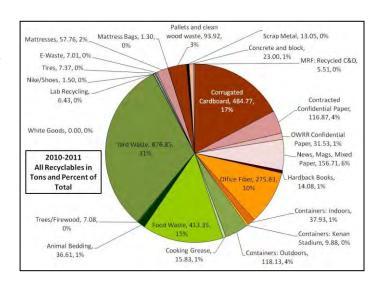


February 2011 Solid Waste Trend Report

Our February 2011 trend report analysis reveals that UNC had a 3% increase in the amount we landfilled over last February. In addition, we achieved a 43% recycling rate for the month, as well as an overall year-to-date recycling rate of 43%.

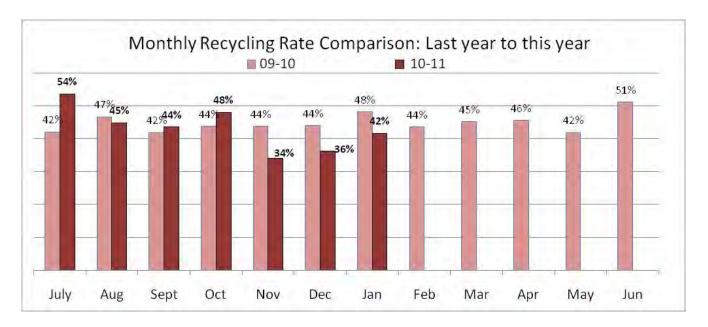
Some highlights:

- While we are still working with the Medical School to get shredded paper figures going back to January 2011, fiber recycling is well over 1,000 tons for the year.
- Bottle and can recycling is on the increase--up 18% over last February.
- Organics still seem to be making up almost half of our campus recycling.
 Yard waste seems to be the key factor here at 200% over last year.
- As confirmed at the recent Carolina Recycling Association conference, markets are going UP! Cardboard revenue, seven months into the year, is \$36,500 which is almost equal to all of last year (\$38,500).



• Rams Head had a 75% recycling rate for February and Lenoir had a 68%... ABSOLUTELY FANTASTIC!

January 2011 Solid Waste Trend Report



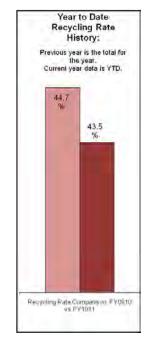
Our recycling rate is 43% year-to-date, which is up 5% from this time last YTD. However, for January, our recycling rate is 42% and recycling amounts to a decrease of 15% or 50 tons from last January. The decrease could be attributed to no longer composting animal bedding, which averaged about 50 tons per month last year. Not getting contracted shredding weights may also be a factor.

Paper from contracted shredding services averages about 23 tons per month or 5% of the recycling for July-Dec. In December 2010, the Hospital began using a new shredding contractor. Amy is working with to Jane Teeter, the School of Medicine's HIPAA Coordinator to get the shredding numbers from Cintas for December and January. Jeff Cohen is the contract administrator and as of the end of February, he had not received the Cintas invoice containing collection.

By way of individual materials recycled, yard waste makes up 32% (780 tons) of the YTD recycling by weight, cardboard is 17% (415 tons), food waste 14% (345 tons) and office fiber 10% (243 tons). As a **category**, organic recycling leads at 48% of our total recycling by weight, surpassing Fiber by 233 tons or 10%.

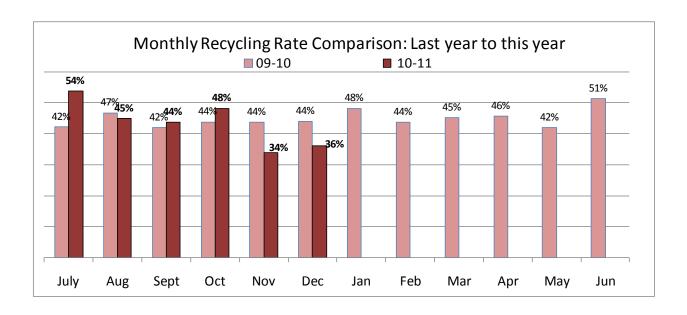
It is clear that yard waste seems to making the largest contribution to our overall recycling rate. To verify this, Paul Rigsbee and his Grounds Dept. crew are weighing sample loads to make sure that our yard waste numbers are accurate.

Surplus also had a spike in waste sent to the landfill this month (11 tons).



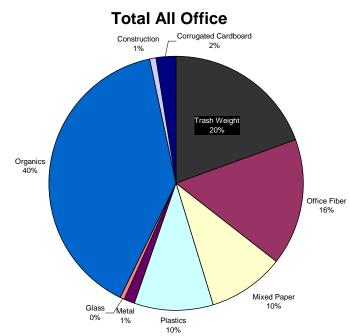
December 2010 Solid Waste Trend Report

The recycling rate for December 2010 was only 36%. This is up from last month, but still down from last December (44%). Overall, the year-to-date recycling rate for campus is 44%.



Our total fiber recycled has gone down from last year by 16% year-to-date (from 1,003 tons to 838 tons). Similarly, a recent waste assessment from the 2010 Fall Capstone Class revealed that in the buildings audited (the Student Union, Law School and Business School) fiber made up 28% of the waste found in office trash.

Overall, it was found that 20% of the materials found in the buildings audited were recyclable in existing programs. The class calculated that if all these materials were recycled the campus could recycle another 1,030 tons of materials, bringing our recycling rate up to 55%. Their report recommended that we adopt this as our campus recycling rate. To view the complete report, click this link or visit the OWRR website at http://owrr.facilities.unc.edu



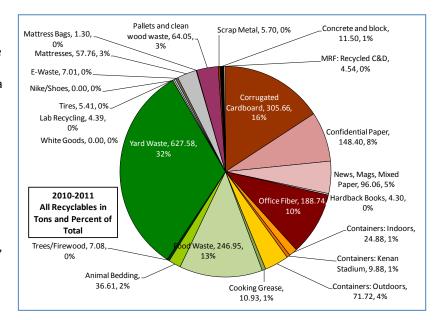
November 2010 Solid Waste Trend Report



The year to date recycling rate as of November was 45%. For the month of November alone, it was 34%. Compared to this time last year, recycling and trash are up slightly—15 % and 10% respectively for the year. However, a comparison of last November to this November shows a significant decrease in recycling—24%, while trash increased 15%. It could be that the increase in trash is pulling the recycling percent down; however, the amount of monthly recyclables at its lowest since July 2009.

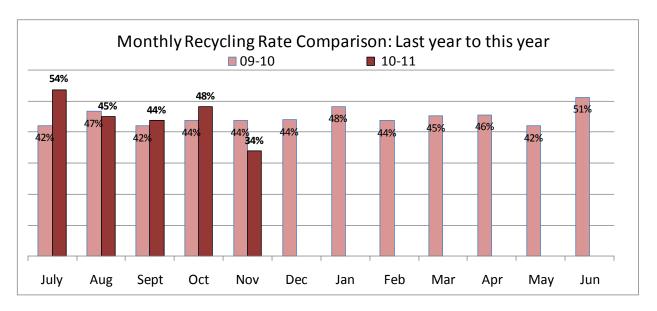
Seasonally, Grounds reported collecting 57 loads each of limbs and leaves each. The chart below shows that yard waste appears to be the number one thing recycled on campus by weight. In January, we will investigate this data source for a better understanding of what's causing a 4-500% increase over last year.

Recycling efforts at Kenan Stadium and the tailgate program resulted in 18.2 tons (36,420 pounds) of bottles, cans and cardboard getting recycled. Overall, stadium operations resulted in a 34% recycling rate. Food waste collection was the latest addition to that program with lemons being collected from 2 games. Literally, we collected a ton of lemons from the two games.



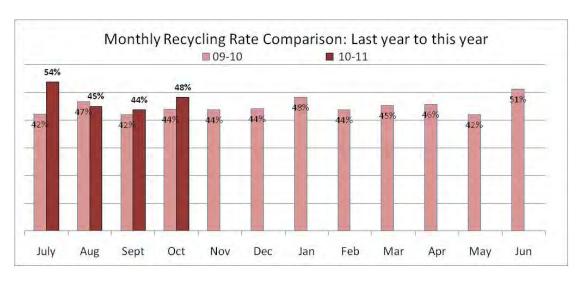
We were not able to get data from Shimar for

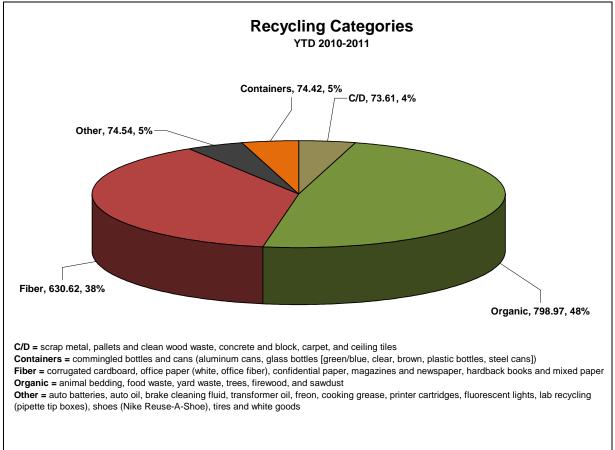
the paper collected by our in-house indoor crew. This material is usually 1.5 tons per month while classes are in session. In December, surplus property will begin reporting scrap metal numbers.



October 2010 Solid Waste Trend Report - 2010-2011 Trend Report

Both our YTD recycling rate is 47% and our monthly recycling rate for October 2010 is 48%. Overall, recycling is up by more than 25% from last year.

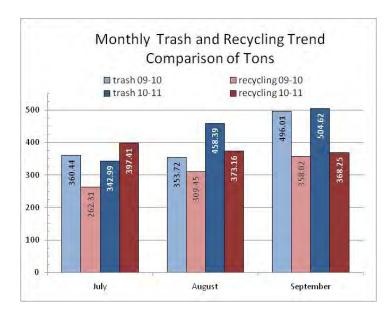




Overall, organics continue to make the largest portion of our recovered materials—especially thanks to the Grounds mulch operations (34% of our YTD recycling total!). Additionally, students in the environmental capstone class recently found that more than **50%** of the waste still being landfilled (from the buildings surveyed) consists of compostable materials. Also noteworthy is the fact that reported tonnages for yard waste make it 70% of all organics now diverted from landfilling by UNC. We believe this increase (+500%) is due to changes in reporting by Grounds. In the coming months, OWRR and Grounds need to work together to assess the reporting method and verify reliability of the data given the huge increase over last year's figures.

While cardboard tonnages have increased slightly, the revenue from campus cardboard continues to climb. This could be due to increased demand by cardboard box manufacturing mills in preparation for the holiday gift-buying season.

September 2010 Solid Waste Trend Report - 2010-2011 Trend Report



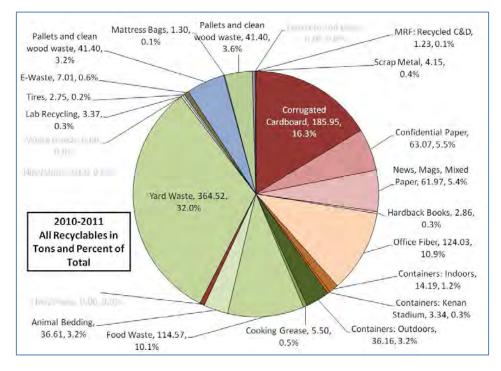
This time last year we were at a 43% recycling rate. This year we are at a 47% year-to-date (YTD) recycling rate with an overall recycling rate of 42% for September 2010.

Amazingly, we collected or processed about 10 tons more trash and recycling (each) than the previous September, thus making almost a mirror image of September data in the graph above. Year to date, our total waste discarded is up 14%. That is to say that materials recycled have increased by 22% and trash landfilled by 8%.

Yard waste, which is collected and processed by the Grounds Department, is now our most recycled material by weight YTD. It accounts for 32% of all the recycling categories by weight.

Currently only 2% of what we landfill is construction and demolition (C&D) waste (not counting contractor waste). C&D waste as defined for our purposes is waste resulting from construction and demolition activities that would be disposed of in a landfill permitted specifically for C&D waste. We also include scrap metal, clean wood waste, and block/brick/concrete in this category. Of the non-contractor generated campus C&D waste, we recycle 60%. Of that 97% is source separated and the rest was processed or separated by a material recovery facility (MRF).

For September, Rams Head and Lenoir dining halls are both at about a 70% recycling rate. CDS (and Aramark) continue to demonstrate outstanding commitment to waste management practices within their operations.

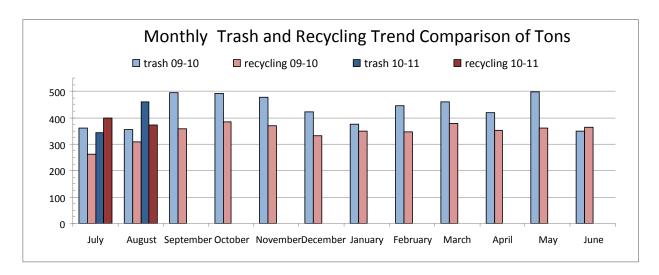


August 2010 Solid Waste Trend Report – 2010-2011 Trend Report

49% recycling rate YTD and 45% for the month of August.

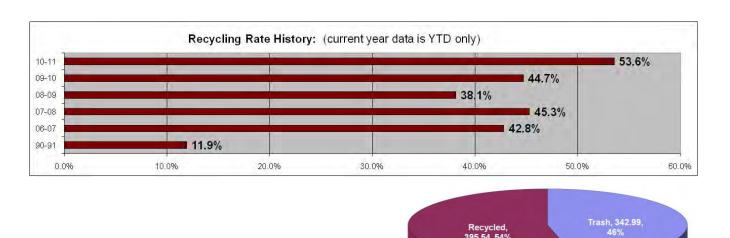
Our recycling went up, but so did our garbage. Recycling up by about 60 tons, while garbage landfilled went up by 30% or 100 tons resulting in a total increase of waste by 25%.

August	Month (in tons)			Year to date (in tons)		
	10-11	09-10	% increase or decrease	10-11	09-10	% increase or decrease
trash	458	354	30%	801	714	12%
recycling	373	309	21%	771	572	35%
total waste	832	713	25%	1,572	1,286	22%
% recycled	44.9%	46.7%		49.0%	44.5%	



Seasonally, August is always a big month for recycling and OWRR. Student move-in generated roughly 25 tons of cardboard for recycling. On an average we can have anywhere from 50-80 tons of cardboard recycled each month. So an additional 25 tons coming in over the period of about a week is truly significant! Overall, we calculated a 46% recycling rate for this move-in! At Fall Fest 26 cubic yards of materials including cardboard, bottles, cans and paper were recycled for a 65% overall recycling rate. Additionally, and perhaps still in the seasonal vein, 75% (YTD) of our organics this year are from the Grounds mulch operations.

July 2010 Solid Waste Trend Report - 2010-2011 Trend Report



July	Month (in tons)					
	10-11	09-10	%increase or decrease			
trash	343	360	-5%			
recycling	396	262	51%			
total waste	739	713	19%			
% recycled	53.6%	42.1%				

This is the first report for FY 10-11. As you can see, our recycling rate is an amazing 54% (53.6%). This time last year, it was 42%, which is a 134 ton increase in total recycling. Fantastic!

What contributed to this? One thing in particular was the recycling of 58 tons of mattresses by Housing this summer and another 1 ton of plastic that covered them. This is the second year that Housing has recycled mattresses, but the first year that we've recorded the data. The second contributing factor was that yard waste was our number one material for July, thus contributing greatly to the increase over last year. Grounds reported 103 tons of yard waste this July—as opposed to only 16.25 tons last July. These two materials account for an overall increase of 145 tons over last July.

For other organics, food waste was comparable to last year with a 5 ton increase (13 tons last year to 18 tons this July). Animal bedding was down, but this was expected as this program is being phased out.

Interestingly, I've never seen the indoor bottles and cans so close in numbers to the outdoor bottles and cans (i.e. those collected in the buildings vs. those collected in blue carts outside of buildings.) Last year 3 tons of bottles and cans were collected indoors and 9.42 were collected outdoors. This year, 4.7 tons were collected indoors and 6.10 tons were collected outdoors. This is presumably due to students being fewer in numbers over the summer and OWRR's removal of several outdoor cart locations from buildings that had indoor containers available.

To view the complete report, visit http://owrr.facilties.unc.edu, trend report and summary.