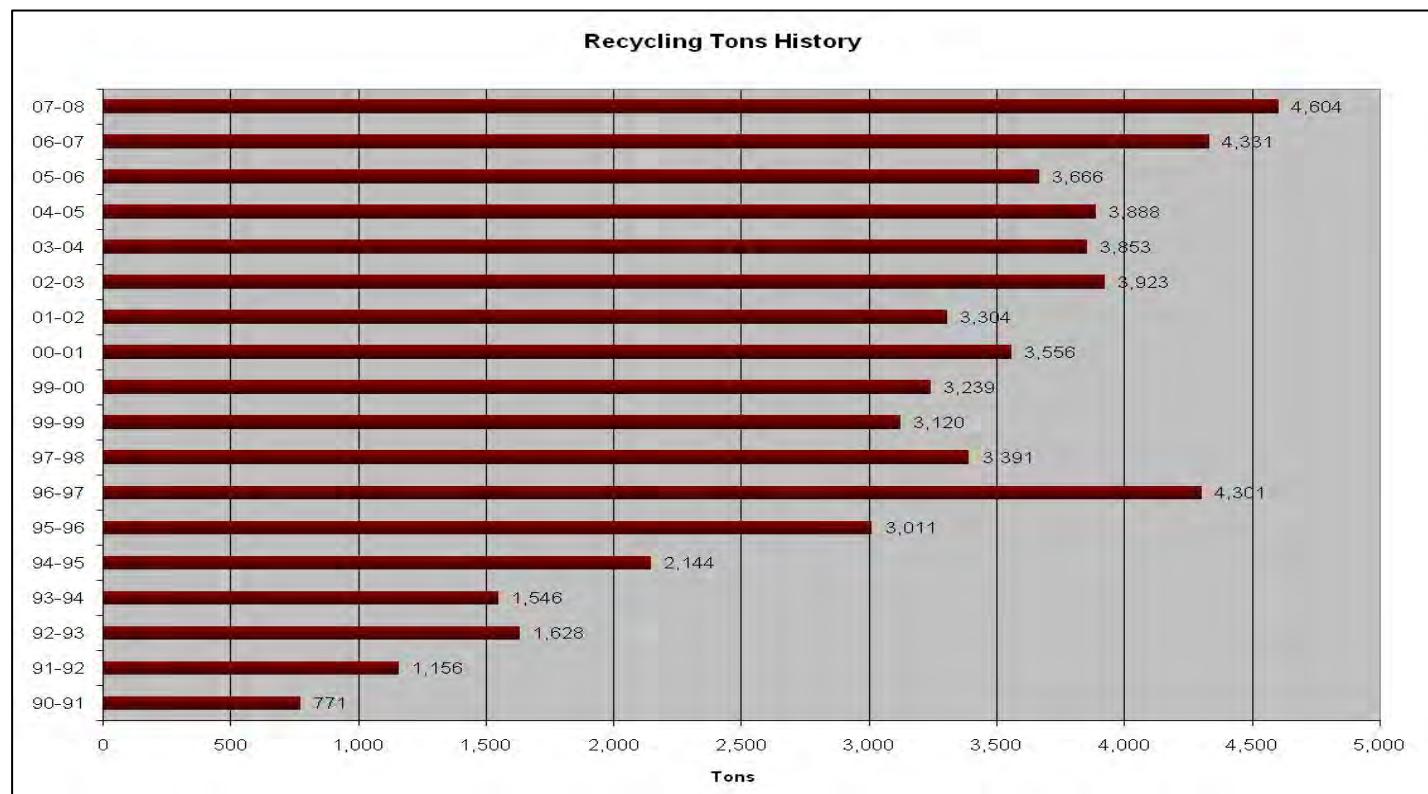
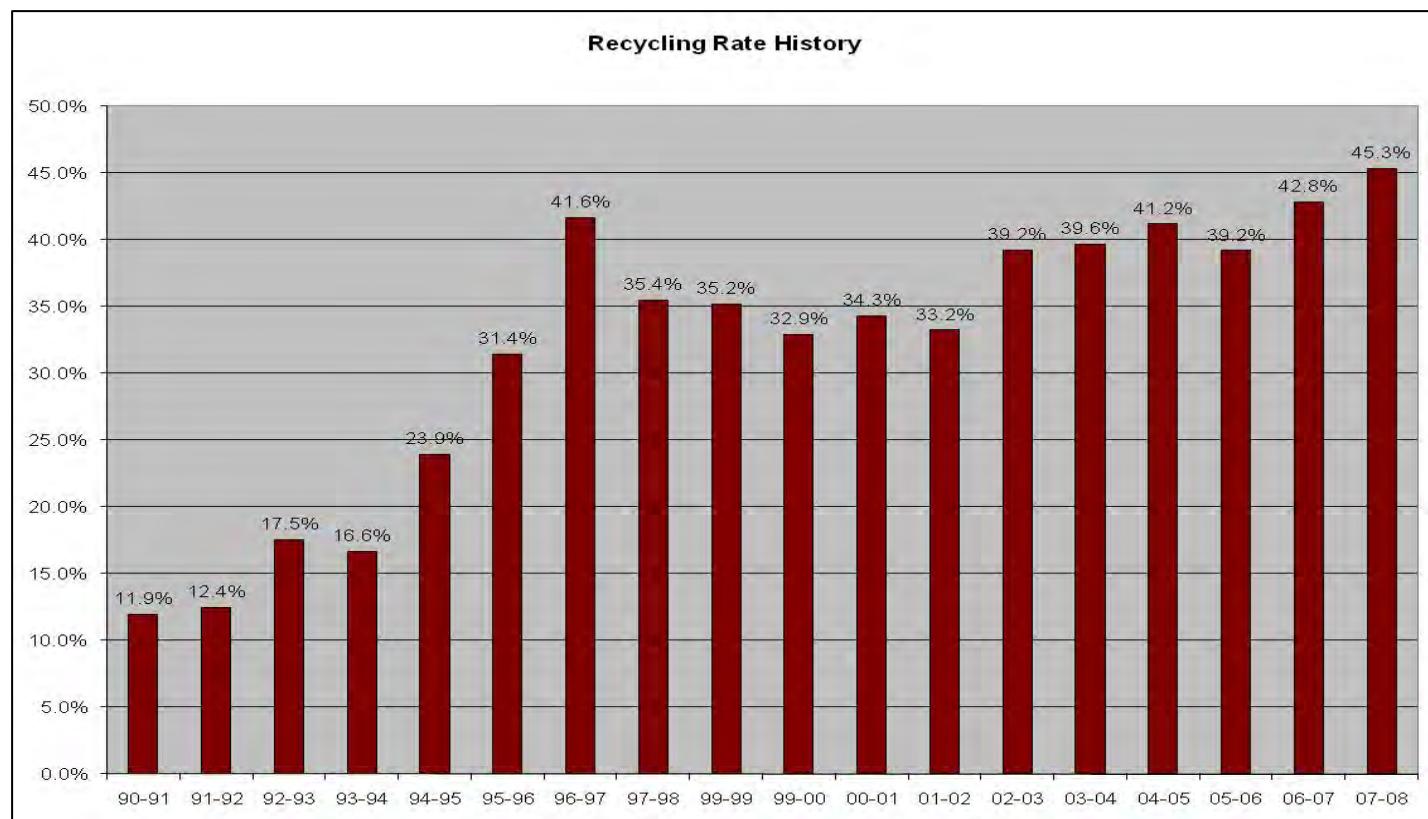


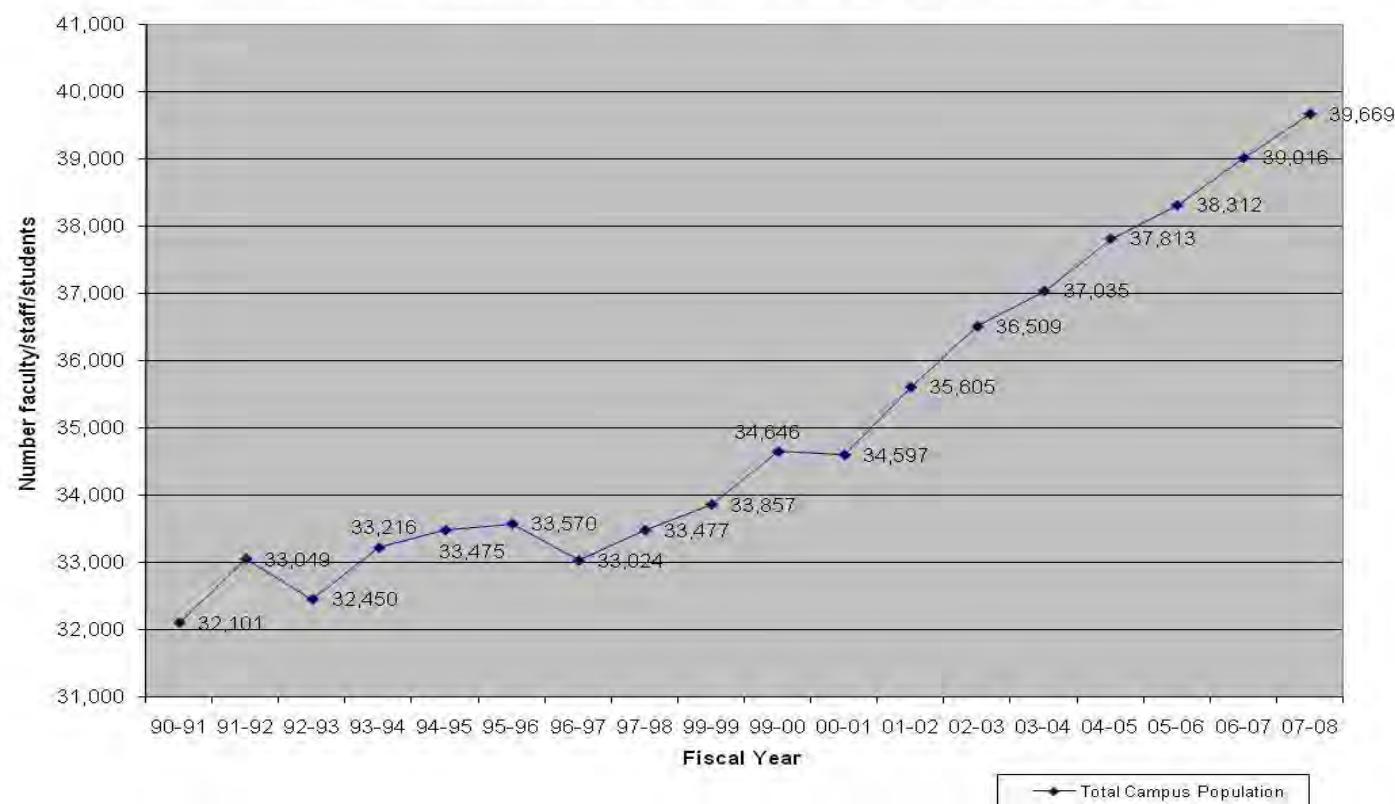
## **OWRR Trend Report Monthly Summary: FY07-08**

To view the full report, please visit our website: [FY 07-08 Trend Report](#).

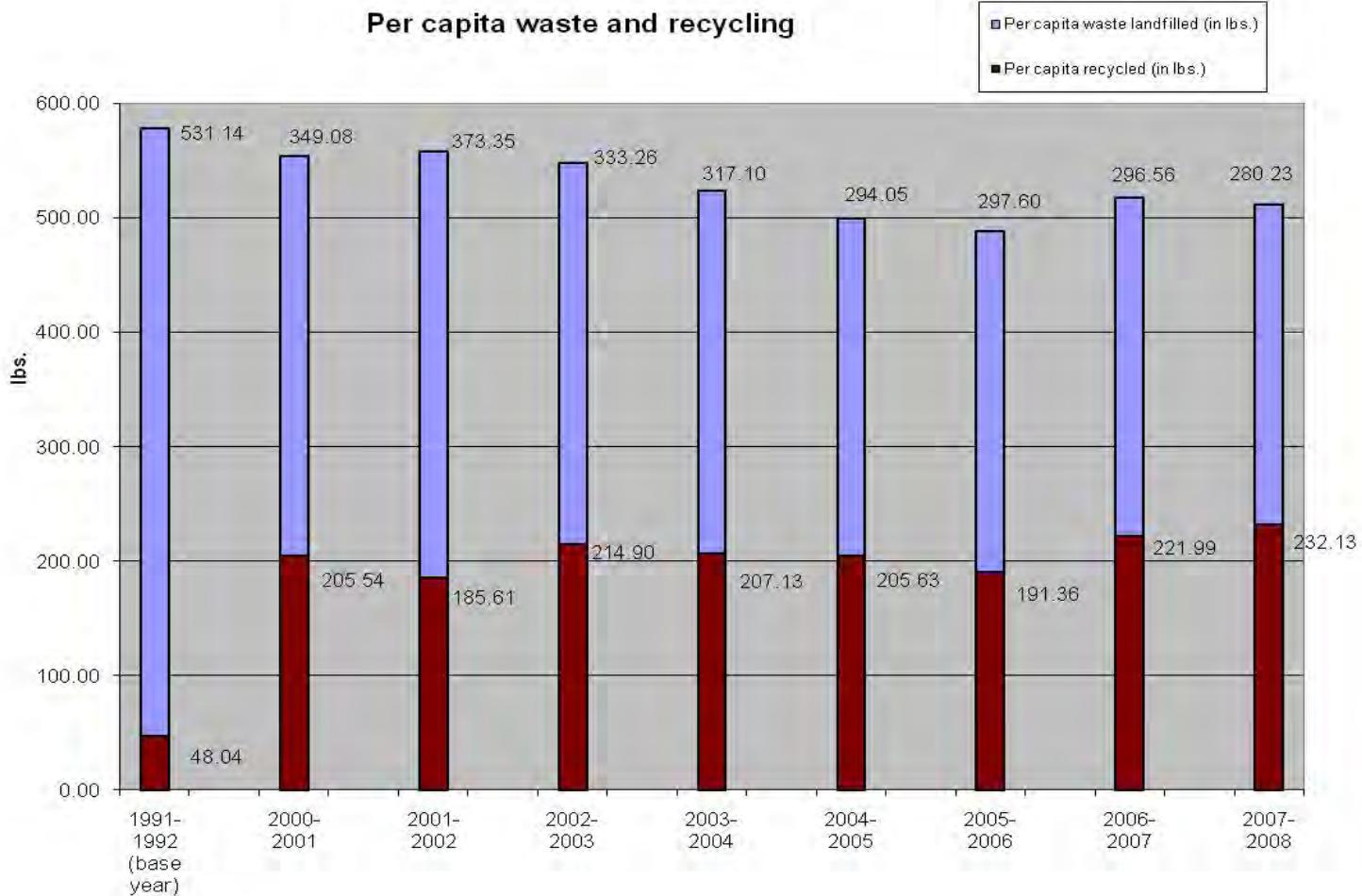
**June 2008**



**Total Campus Population, 1990-2008**  
 (Source: UNC Office of Institutional Research and Assessment <http://www.ais.unc.edu/ir/index.html>)



**Per capita waste and recycling**



**With a little effort, look at what we can do!** Carolina's 45.3% recycling rate has set a new record for the campus community. This year, a record 4,604 tons of materials were recycled. This surpassed last year by 273 tons.

The increase can be traced to several key areas of improvement:

- Recycling from Facilities Services and other campus departments\* construction projects was up 191%. 231 tons of construction and demolition (C&D) waste was source separated and recycled. The Masonry Shops efforts led to 48 tons of block, brick and concrete being recycled—up 17% over last year. Our scrap metal numbers appear to be very strong this year. 118 tons were recycled up by 623%! However, this is also the first year that we have gotten complete data from our scrap metal contractor. Another 24 tons of C&D recycling resulted from mixed materials being separated at local material recovery facilities (MRFs). On average, the MRFs used by Carolina are able to recycle approximately 33% of the mixed C&D waste that is delivered there. Overall, 463 tons of C&D materials were landfilled—8% of the total campus waste stream.
- The campus community also recycled more fiber (or paper) this year. Fiber accounts for 63% of Carolina's total recycling by weight. Fiber recycling was up 17% overall with the greatest increases seen in mixed paper recycling and newspapers/magazines—at 51% and 34% increases respectively.
- Organics recycling stayed steady this year with only a 1% increase over last year. However, at 26% of the total, this is the second largest portion of our recycled waste stream by weight—1,189 tons overall. Recycling of organics can include composting or processing materials into mulch. This area of campus recycling is the result of several departments making monumental efforts to divert waste from the landfill. Animal bedding, which is collected by Department Laboratory and Animal Medicine (DLAM) accounted for 485 tons of composted materials. Carolina Dining Services collected 443 tons of food scraps to be composted. Both of these materials are processed by Brooks Contractors in Goldston, NC into beautiful, dark, rich compost. Grounds is looking at using this product back on campus in the coming year. The Grounds Department processed 242 tons of yard waste and tree trimmings from campus into mulch that will be used back on campus—closing the recycling loop! Carolina Dining Services also collected 18 tons of used cooking oil which will be used by the collection company Ecological Recycling, LLC to make biodiesel.
- Container recycling was down 1% overall this year. Perhaps folks are drinking less bottled water and using refillables?! Still, bottles and cans make up 5% of our total recycling—and it takes a lot of bottles and cans to equal 254 tons. 76% of the bottles and cans recycled on campus are collected from the outdoor sites and it's safe to say that the majority of these are coming from our residence halls. Good work students!

While our campus population continues to grow, on a per capita basis we are landfilling less and recycling more than we ever have. With some 39,669 people on campus, individually we generate 280 pounds of waste per person and 232 pounds of recycling. From our base year of FY 90-91, we've increased recycling 21% and 4.4% from last year. Total waste landfilled from the base year has decreased by 27% on a per capita basis. This year we surpassed our lowest recorded amount landfilled (5,559 tons) in FY04-05 by one ton—landfilling 5,558 tons this year.

Our landfill penalties were up to \$16,226 this year. Also, total waste management costs increased by 12% this year—or 9% after taking revenues from the sale of recyclables into consideration. For the future, we also may see a slight decrease in the total amount recycled. Not that anyone will be actually recycling less. Late this year one of our contractors, who had been using estimated weights, switched to a reporting system that allows them to report actual weights. While it is unclear at this point what the effect will be, initial results are showing that the estimated weights were somewhat higher than the actual weights.

Coal ash, which is a by-product of power and steam production at our cogeneration facility, is actually the largest waste stream on campus. Generating 36,557 tons of coal ash this year, it is three times the total campus waste stream--recycling

#### Campus Recycling

Fiber:	2,898 tons
Organic:	1,189 tons
Containers:	254 tons
Construction:	253 tons
Other:	11 tons

Concrete and block being crushed at International Aggregate in Durham.



#### Fiber Recycling: 2,898 tons

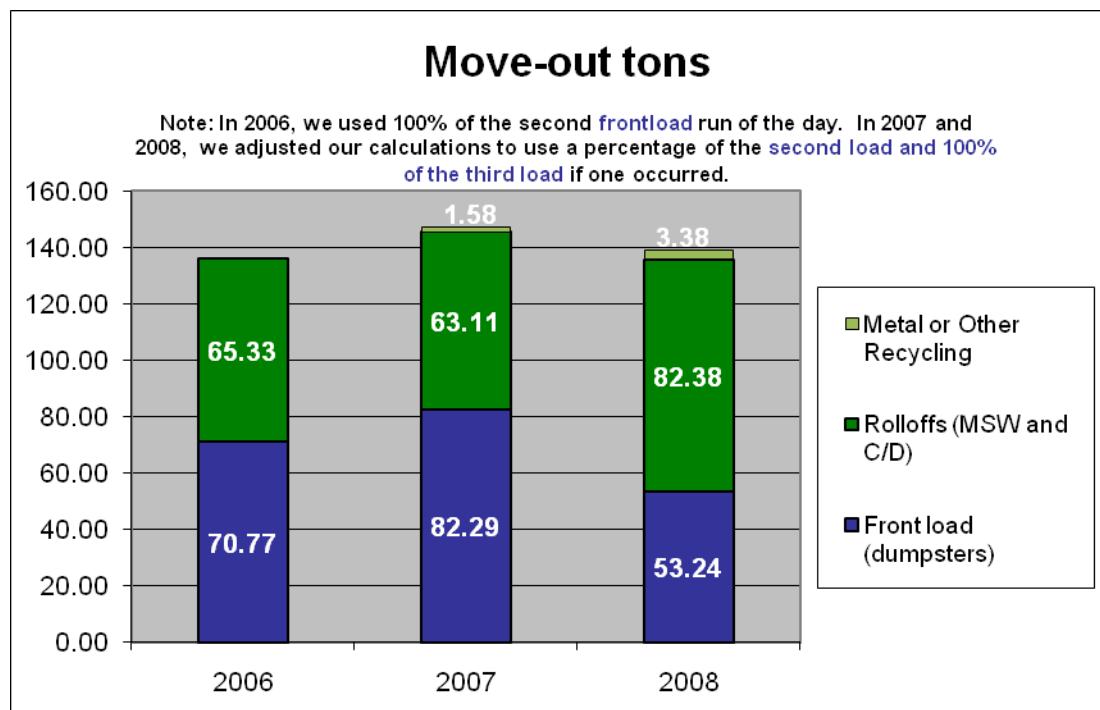
Office fiber:	1,106 tons
Cardboard:	997 tons
Newspapers/Magazines:	706 tons
Confidential paper:	61 tons
Mixed paper:	18 tons
Hardback books:	10 tons

and trash combined. With a waste stream of that magnitude, we do not include the coal ash statistics in the overall recycling and municipal solid waste totals. With that said, the coal ash is recycled! The folks at CoGen work with a company called Full Circle Solutions, Inc. to divert coal ash from landfills and find other beneficial uses. According to a report sent by Full Circle Solutions, Inc., UNC's ash or (coal combustion products) were used in four different types of applications this year.

1. The majority of the ash was used in structural fill applications. The process is very much the same as any earthen fill project you may see in highway, shopping center, and other types of construction.
2. Some of our ash has been used for agricultural applications in Full Circle Solution's product known as Calciplast™. Full Circle Solutions reports that "the ash is combined with ash from other power generating facilities to enhance the spreading capability and product characteristics. Calcium and sulfur in the ash are micronutrients which are beneficial to many crops such as peanuts and sweet potatoes. Calciplast™ is also used as a liming agent on acidic soils for both row crops and pastureland."
3. Small portions of our ash is being used in the construction of a pad for composting other industrial by-products into soil products. Full Circle Solutions reports that our ash has "the ability to bind materials together much like cement." The ash is mixed with other fill materials and is then allowed to set. The binding effect reduces the ability of water to pass through the pad and therefore helps protect groundwater.
4. Finally, our ash is used in composted soils. Full Circle Solutions says that "the high pH of the ash helps reduce acidity in the soil products."

\*See Capital Project construction and demolition report for waste management data on capital projects. We currently do not capture waste data from small to medium sized contracted construction projects.

## May 2008



Carolina's overall recycling rate for the month of May was down to 31.6%. While May is consistently a time when our recycling rates go down and our landfill rates goes up (primarily due to student move-out and the end of the semester), both April and May showed the lowest monthly recycling rates of the past two years. On the bright side of things, the year-to-date recycling rate remains strong at 46%.

Overall, 136 tons of garbage was left behind by students upon their departure. This is down slightly from the 146 tons discarded last year. For the first time, metal futon frames were collected separately and taken to Raleigh to be recycled. Just how many futon frames does it take to add up to 3.38 tons?!

Cardboard fines for student move-out were significantly less this year. We were not assessed any fines for the large open-top rolloffs used for move-out this year and we received fines for only one dumpster-collected load. Last year 5 loads from

the dumpsters were significantly contaminated. Fines dropped from almost \$2,000 during the '07 move-out out to \$489 this year.

All of our contracted service agreements were put out for bids this year. Costs for the new service contracts increased on all except one. Of the increases, the average percent of the increase was 5%. The per ton price for the indoor contract, however, was significantly reduced. The overall result for the University should be a net savings. With that said, it is important to remember that many of our fees are tonnage dependent and can fluctuate unpredictably throughout the year.

UNC shops and departments have source separated 227 tons of construction and demolition materials such as wood, concrete/brick, and scrap metal so far this year. Construction and demolition waste makes up 8% of the total waste landfilled.

Fiber continues to be the number one recycled material and represents 63% of the total recyclables by weight. Containers account for 5%, construction and demolition debris is 6% and organics make up 26% of the total recycling for campus.

## April 2008

A new section has been added at the end of the Municipal Solid Waste Section, page 40, which shows the amount recycled each month. You'll see that for the month of April 2008, our recycling rate dropped to 36%. That was the lowest monthly recycling percentage experienced this year or last year. While the exact cause of the lower recycling rate is unknown, our hunch is that it was due to a closer look at how weights were reported by at least one of our recycling contractors. This brought our overall **year-to-date rate, as of April, down to 47%**.

Scrap metal numbers were reported for the past year by the vendor that services Surplus, thus raising the amount of scrap metal that was reported to be recycled from 60 tons to 144 tons for 07-08. Food waste was up by about 10 tons for the campus this month.

Next month, May's report will reflect student move-out data and an overall lower food and beverage container recycling due to the end of the year reduction in campus population. Next month will also be the first month for which we will receive actual weights for our indoor program. Therefore, we may see a change in the reported trends for this segment of our waste stream.

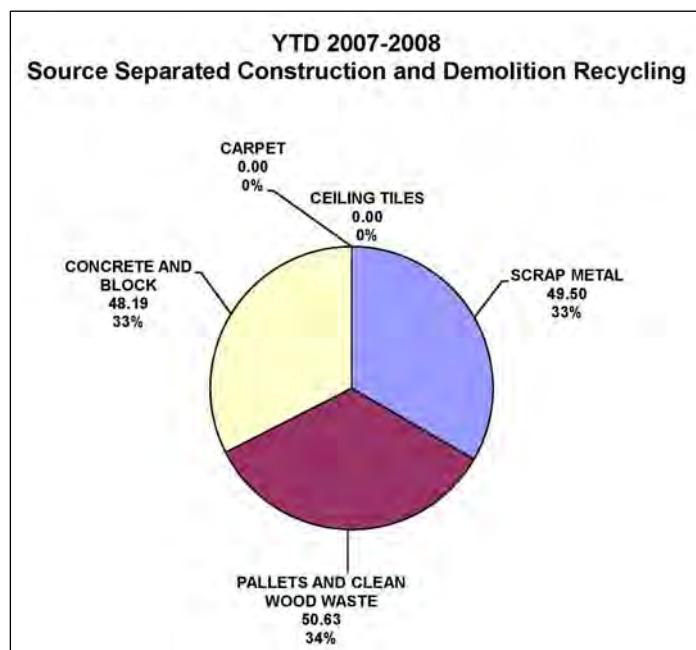


## March 2008

While Carolina's year-to-date recycling rate continues to hold at a 48%, the recycling rate for the month of March was 50%. On a per capita basis, the amount landfilled and recycled per person were equal—452 pounds.

A recent review of one of our contractor's reporting methods (volume to weight conversion) caused us to revise the numbers submitted to RecycleMania and change the way we receive information in the future. Starting with the data for the May trend report, we will be receiving actual weights for indoor paper and bottles/cans. Therefore, we may see lower recycling numbers in the future and consequently a lower overall recycling percentage.

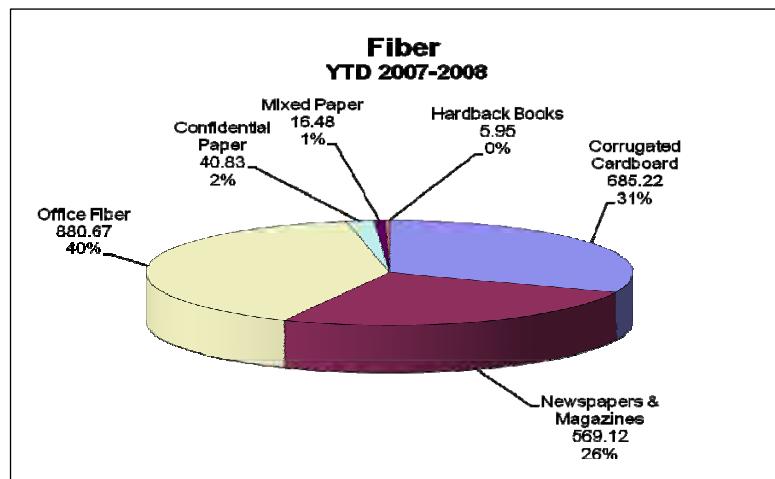
Another future trend will be that more of what is currently being sent to the C&D landfill will instead be directed to the MSW landfill. This is in response to a recent audit of Orange County landfill practices by the State and a subsequent dictate to follow the C&D waste statutes more strictly. Only materials directly resulting from building renovation, construction, demolition and remodeling—and not ongoing maintenance—can be disposed in the C&D landfill.



Organics make up 25% of overall recycling, paper 65%, bottles/cans and C&D both make up 5% and other materials account for 6.25%. Of the C&D materials that are source separated for recycling, wood/pallets, metal and concrete/block each make up approximately one third. No pallets were hauled from Surplus and only one cardboard fine was received in March.

## February 2008

Carolina's recycling rate continues to hold at a healthy 48%. Products made from fiber (or paper) continue to make up 65% of our recycling by weight. This graph shows fiber recycling in greater detail. Fiber recycling has increased by 24% over this time last year and newspaper recycling is up 46% from last year. Cardboard markets continue to remain strong and revenue for recycling old corrugated containers, or OCC as it is known in the industry, is up 80% over last year. This is a good thing, because our total for landfill penalties topped out at \$13,000 year-to-date—exceeding all previous years. Notably, we are seeing more fines for pallets, not just the usual cardboard, mixed in with trash going to the landfill.



On a good news note, food waste recycling is up to 40% of the total organic waste collected (up from 38% last month). On the flip side, Café McColl was dropped from the food waste program by the county due to low generation rates. They did not produce the 2 ton minimum needed to justify a pickup by the contractor. One way of looking at it is that they just don't have that much food waste to be composted.

In February, the Masonry Shop recycled 14.08 tons of brick, stone, and. Notice that this is almost as much, in weight, as all of the mixed paper collected on campus so far this year!

## January 2008

**Carolina is holding strong at a 48% recycling rate for the month of January!**

**Carolina recycled an all time high of 150 tons of office paper in January 2008.** The record previously was 123 tons in August 07 and 118 tons in August 06. So far this year, we are about 10% over totals for last year and are averaging 107 tons a month of office paper recycled. This is much higher than averages for previous years: 83 tons in 06-07, 73 tons in 05-06, and 67 tons per month in 04-05. Newspaper and magazine recycling is also up 38% over last year. Cardboard recycling is up 20%, which is good news. We received only one fine for cardboard-contaminated loads this month and cardboard revenue is \$36.7K--double what it was this time last year.

Pallet recycling reached an all time high for the year at 7.67 tons. About half of this was hauled by campus trucks and the other half was collected at the convenience center at Surplus.

It was reported this month that the Orange County construction and demolition landfill will no longer accept materials other than those directly produced from construction and demolition activities—meaning that furniture and bulky waste will, beginning in March, be directed to the MSW (municipal solid waste) landfill. This will mean that all bulky waste from student move-out and surplus will now go to the MSW landfill, which is scheduled to close in 2011 (or sooner now). An estimated 200+ tons will be redirected to the MSW landfill with this change.

## December 2007

Carolina's overall recycling rate remains at 48% and the Construction and Demolition recycling rate slightly dipped to 34% in December. The total waste and recycling collected in December was lower due to the winter break.

1,575 tons of fiber (all types of paper and cardboard) have been recycled so far this year—up 14% over last year. Magazine and newspaper recycling is up 38%. The top 5 recyclables remain in order by weight (year-to-date):

1. Office Fiber: 596 tons
2. Corrugated Cardboard: 512 tons
3. Newspapers/Magazines: 413 tons
4. Animal Bedding: 293 tons
5. Food Waste: 243 tons

Only two loads of waste received mixed load penalties for cardboard in December—totaling \$527! This is our second lowest fine total since October, which was \$216.

Bulky waste disposed from the Surplus Convenience Center was at an all time low for the year at 3.96 tons. No wood/pallet loads were hauled from the convenience center in December.

### **November 2007**

Carolina's recycling rate remains strong at 48%. Also, recycling of construction and demolition waste reached 35%. The masonry shop deserves much of the credit for this—they recycled 24.11 tons of brick/concrete in November.

Three loads from dumpster pick ups were penalized at the landfill in November for containing cardboard. One dining hall and one wood rolloff also received fines. Fines for the month totaled \$980. The total for the year, so far, is just over \$12,000. This is just under where it was for all of 06-07. However, fines didn't pick up in 06-07 until April. So overall, they are tapering off, which is good.

Coal ash statistics were not received for October or November.

### **October 2007**

Carolina's overall recycling rate is hovering in the high 40's and has dropped from 49% in September to 48% for October 2007.

The campus received two mixed load penalties this month. One for cardboard in a dining hall compactor and another for painted wood in one of the wood rolloffs on campus. Fines totaled only \$216 this month. This is an excellent job. While the trend is moving downward, early reports are that several November landfill-bound loads contained cardboard. We send a sincere thanks to everyone who has taken action to keep cardboard out of the trash and encourage you to continue your vigilance.

Football season ended this year with a much lower recycling results than last year. The overall recycling rate for home games dropped from 44% last year to 24% this year. We have not yet met with Athletics to discuss what may have contributed to the drastic difference this year. However, the football stadium recycling program diverted 12 tons of materials from the landfill. 12,120 pounds of beverage containers and cups and 12,660 pounds of cardboard were collected by hard working members of the campus ROTC program which held the contract to clean the stadium after games.

Food waste composting is a going strong on campus with 60 tons collected in October. Since the program started in August 2000, almost 2,800 tons of food waste have been composted by our dining halls. The newest addition to the program, Café McColl, is producing weights (1,200-1,400) under the contractor's minimum requirement for the collection. Stakeholders will evaluate this pick-up location and see if there is additional waste from the facility that can be added to make the stop viable.

29% of the construction and demolition (C/D) waste generated by campus operations is recycled—97 tons this fiscal year. 85 tons or 26% of this was source separated by university personnel on the jobsite and taken to dedicated brick/concrete, scrap metal and wood waste containers. 29 tons of mixed load C/D waste has been hauled to mixed load processing centers (MRFs). Of this, an estimated 12 tons were recycled and 17 tons were landfilled. Overall, 13% of the waste landfilled by the University is C/D waste.

Miscellaneous: No weights were reported for coal ash by Cogen this month. An error was corrected in the weights for Café McColl's August food waste numbers. The report now reads 0.60 tons and not 6 tons. Also, in the November trend report, weights from all the football games will be added into the appropriate month and section for trash, cardboard and containers.

### **September 2007**

Carolina was at a 49% recycling rate for the month of September! 28% of our construction and demolition waste has been recycled as well.

Fiber and Organics are the two largest portions of the recycled waste stream. Fiber makes up 63% of everything recycled on campus and organic material makes up 26%. Year-to-date, the top five materials recycled on campus (by weight) are:

1. Office Fiber: 313 tons
2. Corrugated Cardboard: 238 tons
3. Newspapers/Magazines: 195 tons
4. Animal Bedding: 132 tons
5. Food Waste: 102 tons

During September, Lenoir Dining Hall recycled the most (by weight) of any location on campus (with the exception of the Cogeneration Facility—see note). In September, Carolina Dining Services employees at Lenoir recycled 31.44 tons of food waste and 9.95 tons of corrugated cardboard. The next largest single location recycler is Grounds. They processed 23.83 tons of wood waste at their grinding area on the Carolina North property.

*\*Note: Cogen is actually the largest single location recycler on campus. Cogen produced and recycled 1,054 tons of coal ash in September. We do not include our overall recycling statistics.*

Cardboard fines for September have decreased to \$1,300 down from \$4,700 in the previous months!

#### **August 2007**

August has been a great month for Waste Reduction and Recycling at Carolina with a 52% recycling rate! In addition, 33% of our campus construction and demolition\* waste has been recycled!

While we had almost \$5,000 in cardboard fines this month, the amount collected and revenue for cardboard were both at an all time high. We recycled 105.77 tons of cardboard this month compared to 76.72 tons in August 2006 and 71.93 tons in August 2005.

Student move-in this year accounted for 23.24 tons of cardboard—5 tons more than last year! We also had 3 tons more trash. Our overall recycling rate for student move-in was a very impressive **50.83%**. That is up from 35% in 2006. Well done!

The 2007 Football season is in full swing with recycling rates of 24% (vs. James Madison) and 26% (vs. Virginia). This is lower than last year's rates possibly due to plastic weight being higher because of liquid contamination in the loads. There was also less overall waste despite the games' attendance increasing.

Both Lenoir and Rams Head have seen increases in tons composted and have posted high recycling rates at 70.8% and 43.1% respectively. Rams Head food waste is pulped and the water has been extracted, thus recycling rates for Rams Head on a volume basis are higher than reflected by the weight basis. Also Rams Head received no cardboard fines this month! For the first time, we have recorded cooking grease statistics provided to us by Carolina Dining Services. Ecologic Recycling, LCC collected 1.57 tons of cooking grease in August. All oil is being used for bio-diesel fuel.

We were able to recycle 3.17 tons of scrap metal from shelving removed from the Davis Library basement. The shelves were replaced by compact shelves. These new compact shelves can be moved around and has greatly increased the amount of storage area in the basement.

*\*Note: C&D waste here refers to campus generated waste, not capital project or contractor generated waste.*