



Recycling Works

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Harvesting at the Other End: Annual Food Waste Generation in N.C. Reaches Almost 1.1 Million Tons

by Rachel Leven, Graduate Intern, N.C. Division of Environmental Assistance and Outreach

A new study by the N.C. Division of Environmental Assistance and Outreach examines food waste generation and current estimated recovery in North Carolina. The study was conducted in preparation for the 2012 Southeast Food Waste Reduction Conference, to be held in Charlotte Nov. 12-13, 2012, and to help North Carolina plan initiatives to address this large waste stream.

The study's major findings include:

- Food waste makes up more than 1.1 million tons, or 12 percent, of overall municipal solid waste generated each year in North Carolina.
- When analyzed as specific sources, the annual amount of food waste generated in the residential and commercial sectors is projected to be 673,362 and 569,343 tons, respectively.
- Together, fast-food and full-service restaurants produce the largest portion of food waste in the commercial sector.
- On average, an individual supermarket produces 106 tons of food waste every year, more than twice the amount produced by any other single retail establishment.
- The opportunities and infrastructure for food waste diversion are increasing as more composters accept food waste into their material stream.



Approximately 1.1 million tons of food waste is generated in North Carolina each year.

The estimates for food waste generation are based on careful analysis of waste characterization reports from states across the

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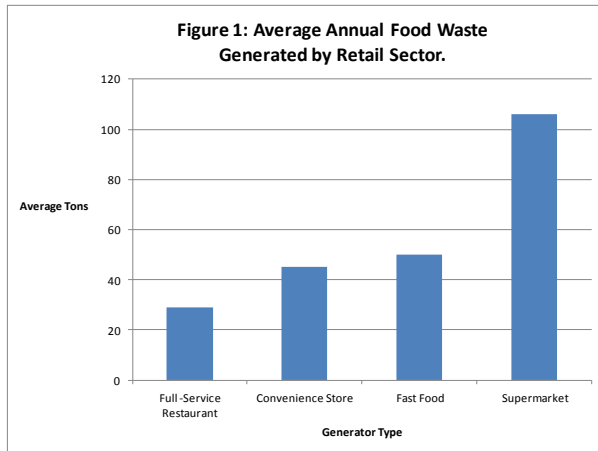


Figure 1. Average Annual Food Waste Generated by Retail Sector.

country including Nebraska, Oregon, Connecticut, Georgia, California and Wisconsin, as well as research by the Cascadia Group, Dr. Timothy Jones, Draper/Lennon Inc., the U.S. EPA and local county waste generation data. Data on food waste diversion in North Carolina is based on annual solid waste facility reports filed from 2005-2011 by permitted composting facilities. A complete list of data sources is provided in the full report.

DEAO's estimates show that food waste is ripe for the taking. Based on DEAO's study, the mean estimate for the residential sector was 673,362 tons-per-year, or seven percent, of the total disposed waste stream. Some of the data sources used in this study, such as the [USDA Food Loss Project](#), project higher estimates for food generation. Using the USDA projections, for example, N.C. households could produce as much as 847,075 tons of food waste every year. This large tonnage points out the need for North Carolina to begin to develop residential food waste collection programs.

In the commercial sector, estimated to produce 569,343 tons of food waste per year, fast-food restaurants were found to generate the largest portion of waste as an industry. However, supermarkets were identified as a valuable first target for food waste diversion programs due to the large amount of food waste generated per store: 106 tons. As large singular generators, supermarkets may func-

tion as a critical anchor in commercial food waste collection routes. Figure 1 illustrates the average annual food waste generation by retail sector.

In an analysis separate from the food waste generation study, DEAO reviewed data from permitted composting facilities and found a growing trend in the amount of food waste received by composting facilities. As seen in Figure 2, the total amount of food waste received at composting facilities in North Carolina has grown steadily from 32.1 tons per year in 2005 to more than 26,000 tons in 2011.

This material is provided in large part by food-related manufacturing and is not included in the 1.1 million tons estimated in the report. However, roughly half of the composted food is collected

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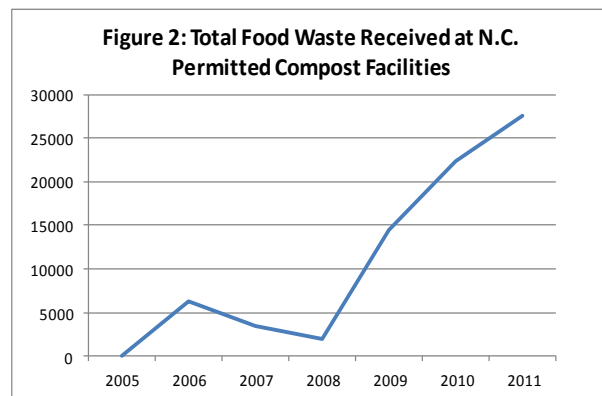


Figure 2. The total amount of food waste received at N.C. permitted compost facilities has grown steadily from as low as 32.1 tons per year in 2005 to more than 26,000 tons in 2011.

Recycling Works is published by the N.C. Recycling Business Assistance Center, a program of the Division of Environmental Assistance and Outreach of the N.C. Department of Environment and Natural Resources. For more information call 877-623-6748, or write to DEAO, 1639 Mail Service Center, Raleigh, NC 27699-1639.

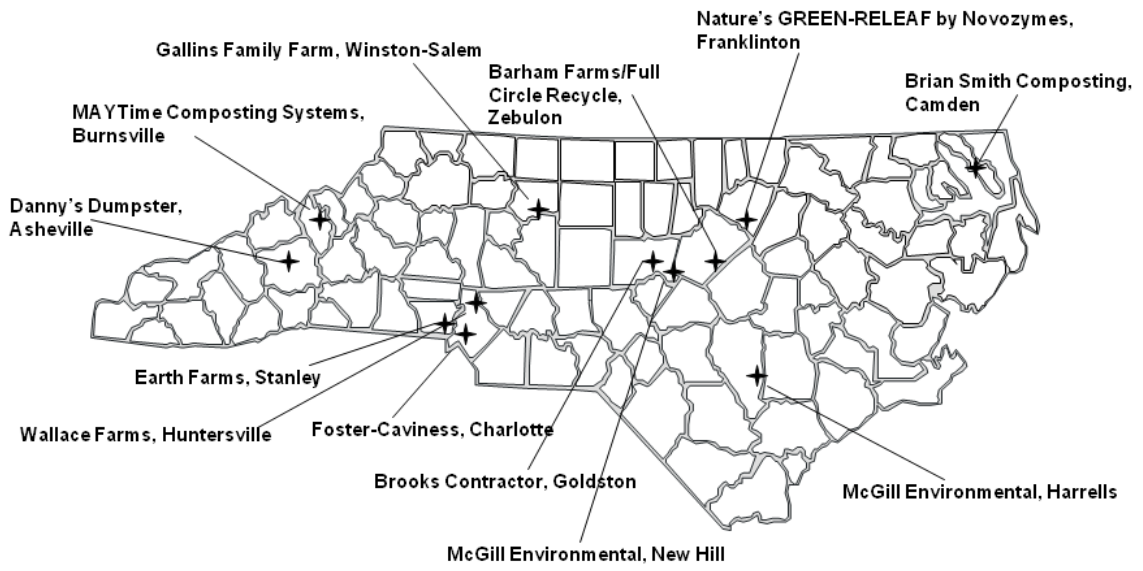
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Type III* Compost Facilities in North Carolina



***Type III compost facilities can accept food waste.**

Figure 3. Map of Type III compost facilities in North Carolina. Type III compost facilities can accept food waste in the facility's operations.

from institutions and retail outlets. The actual overall amount of diverted food waste is higher than the commercially composted fraction through such activities as backyard composting and charity food programs; however, no formal data is available on this collected tonnage.

With food waste comprising more than 12 percent of the N.C. waste stream, food waste diversion is the next big area for the state to focus recovery efforts. The collection and composting infrastructure is growing, as is the public's acceptance to composting food waste. An increasing number of private composting facilities are seeing business opportunities in recovering leftover food. Currently, at least 12 Type III private compost facilities accept food waste across the state (figure 3).

While compost facilities are increasing their appetite for food waste, they require source-separated organic material free of plastics, metal and other contaminants. As seen in the DEAO report, individual supermarkets generate large amounts of clean, source-separated food waste. For this reason, the report recommends that local governments and commercial composters target the retail sector with aggressive diversion strategies. This consistent source of food waste may also help to shore up the growth of other collection infrastructure, such as restaurants and residential communities.

For more information or for a copy of this study, contact Rachel Leven at 919-707-8138 or rachel.leven@ncdenr.gov, or Scott Mouw at 919-707-8114 or scott.mouw@ncdenr.gov.



**2012 SOUTHEAST
FOOD
WASTE
REDUCTION
CONFERENCE**

SAVE THE DATE!
Hilton University Place
Charlotte, NC
NOVEMBER 12-13, 2012
*A symposium to foster high value solutions for
food scraps and food residuals*

Southeast Food Waste Reduction Conference in Charlotte: Nov. 12-13, 2012

by Scott Moww, CBAS Section Chief

With more than 1.1 million tons of food waste generated in North Carolina each year and many more millions of tons disposed across the Southeast, the opportunities to divert this material to beneficial uses are tremendous. Activity is already increasing in the region to grow a broad-based infrastructure and host of options for food waste reduction, including food donations, composting and exciting new technologies like anaerobic digestion.

The opportunities for food waste diversion will be fully explored at the upcoming Southeast Food Waste Reduction Conference on Nov. 12-13, 2012 in Charlotte. The event will feature a comprehensive program and an exhibit hall of equipment and supply vendors serving this growing industry. Session topics include:

- National, regional, state and industry perspectives on the food waste challenge
- Anaerobic digestion
- Major initiatives on food waste recovery
- Food waste collection from both the generator and collector perspective
- Residential food waste recovery
- Community-based food waste programs
- Food rescue and donation options
- Broad environmental benefits of food waste diversion

The conference will also include tours of compost operations and collection programs.

For more information on the 2012 Southeast Food Waste Reduction Conference, please visit: <http://www.cra-recycle.org/foodwasteconference/>

The conference is presented by the Carolina Recycling Association, North Carolina Composting Council, the N.C. Department of Environment and Natural Resources, the S.C. Department of Health and Environmental Control and the U.S. Environmental Protection Agency Region 4, and it is endorsed by the Southeast Recycling Development Council and the U.S. Composting Council.



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The FOG is Lifting in North Carolina! Fats, Oils & Greases Find New Life

by Brian Rosa, Organics Recycling Specialist

FOG — fats, oils and grease — have been a general nuisance in municipal sewer systems for quite some time. However, this difficult-to-handle material is finding new life and the difficulties surrounding its management are starting to ease thanks in part to a new group of entrepreneurs that is diverting them into fuel. According to the [N.C. Biofuels Center](#), biofuel businesses operating in the state are abundant and many can be found in its [Directory of Bio-fuel Organizations](#).

While many saw difficult times during the economic downturn, a number of strong and vibrant companies have survived the storm and are expanding their businesses. Several companies have been around since the beginning of the biofuel movement and were the catalyst to the surge in biofuels as an alternative fuel here in North Carolina.

Piedmont Biofuel

About 10 years ago, Piedmont Biofuels started out as a cooperative making fuel with and for its members. Located in Chatham County, the company collected used oil from restaurants around the county and processed it into vehicle-grade biodiesel for the company's internal use.



On Friday, June 22, 2012, Piedmont Biofuels cut the ribbon to officially open the company's biodiesel plant.

Within a short period of time, the founding members knew they were on to something much larger. They purchased a post-Cold War industrial complex on the edge of Pittsboro to repurpose into a biodiesel manufacturing facility.

Piedmont Biofuel established collection contracts with and placed containers at local restaurants and



Piedmont Biofuel repurposed the industrial complex near Pittsboro, seen above, into a biodiesel manufacturing facility.

animal meat processors. Eight years ago, most restaurants paid to have their used oil removed. Now, with the new paradigm, used oil collectors must pay the generators to take it away. What once was considered a waste is now a commodity. Piedmont Biofuels provides distribution and deliveries to a large network of gas stations, distributors and satellite pumping stations for its cooperative members throughout the Triangle area.

Piedmont Biofuels continues to lead the way with the company's latest announcement to create the first enzymatic biodiesel plant — the first facility

(FOG's continued on page 6)



Piedmont Biofuel's new enzymatic biodiesel plant, seen here, expands the range of feedstock — fats, oils and greases — able to be produced into B100-grade biofuel.

FOGs continued from page 5

capable of creating renewable fuel using an enzymatic catalysis. The new technology expands the range of feedstock — fats, oils and greases — able to be produced into B100-grade biofuel.

"Enzymatic catalysis opens the industry up to billions of gallons of new feedstock which have previously not been available to the biodiesel industry. We think the next generation of sustainable biodiesel will come from deeper in the waste stream," said Lyle Estill, Piedmont Biofuels vice president. "Piedmont's new technology will allow lower-quality, and therefore less expensive, waste products to be developed into the same quality of diesel."

For more information, contact Lyle Estill at 919-321-8260 or lyle@biofuels.coop, or visit <http://www.biofuels.coop/>.

Blue Ridge Biofuels

Much like Piedmont Biofuels, Blue Ridge Biofuels started as a cooperative collecting used vegetable oil from local restaurants and processing it into biodiesel in a reactor made from a modified 55-gallon drum. By 2005, with the interest in biofuels growing and the dedication of the founders — Woodrow Eaton, Mac Minaudo, Micah Nerenberg and Brian Winslett — Blue Ridge Biofuels put a business plan together, incorporated, and went to work. They built a customer base of more than 500 restaurants to collect used (waste) oil and process into biodiesel that meets the national ASTM D6751 standards.



The young girl above deposits used cooking oil into one of Blue Ridge Biofuel's residential collection containers located in western North Carolina.



Blue Ridge Biofuels has approximately 18 residential used cooking oil recycling collection bins, like the one seen above, located in Asheville and surrounding areas.

From those humble beginnings, the company has grown and thrived. To capture more waste oil for feedstock in the biodiesel production, Blue Ridge Biofuels established the [Cooking Oil Recycling \(COR\) Program](#) that provides residential used oil collection containers throughout western North Carolina. As part of that program, the company provides education and promotional materials to customers and citizens. The company recently announced that they have processed and distributed more than one million gallons of biodiesel.

Blue Ridge Biofuels has partnered with many organizations and businesses throughout the Asheville area for the benefit of all. By providing the COR Program, Blue Ridge helps the city of Asheville and the Metropolitan Sewerage District (MSD) reduce costs associated with sewage backup due to grease and oil blockage in municipal sewer lines. The cost of maintaining and unblocking grease clogged sewer lines can cost upwards of \$200,000 a year. Providing biodiesel at a competitive cost to customers also provides important environmental benefits.

(FOGs continued on page 7)

FOGs continued from page 6



Blue Ridge Biofuels' employee checks the gauges on the company's biodiesel manufacturing equipment.

For more information, contact Brian Winslett, Blue Ridge Biofuels' Managing Partner, at info@blueridgebiofuels.com or 828-253-1034, or visit <http://www.blueridgebiofuels.com/> and <http://www.cookingoilrecycling.org/>.

Grease Cycle

Established in 2009, Raleigh-based Grease Cycle provides collection and pumping services for used cooking oil. All of the collected oil is processed into a renewable biofuel.

In June 2012, Grease Cycle announced plans for business expansion with the construction of a new grease refining facility in Raleigh. Grease Cycle's services include commercial kitchen drain management, quarterly introduction of grease ameliorating bacteria, and annual line-jetting. Using a real-time sensor and state-of-the-art technologies to monitor and maintain customers' grease traps, the company pumps the traps only when necessary.



For more information, contact Grease Cycle's Chuck Hackney at 919-817-8706 or customersupport@grease-cycle.com, or visit <http://grease-cycle.com/>.

Related Terms and Definitions

Anaerobic process — means a biological treatment process that occurs in the absence of dissolved oxygen.¹

Biodiesel — any fuel or mixture of fuels derived in whole or in part from agricultural products or animal fats or wastes from these products or fats.²

Diesel fuel — any liquid, other than gasoline, that is suitable for use as a fuel in a diesel-powered highway vehicle. The term includes biodiesel, fuel oil, heating oil, high-sulfur dyed diesel fuel, and kerosene. The term does not include jet fuel.²

Biofuel — a fuel that is made or derived from organic substances, that meets the American Society for Testing and Materials (ASTM) standards for use in motor vehicles, and that is sold commercially.²

Renewable biomass resources — organic matter produced by terrestrial and aquatic plants and animals, such as standing vegetation, aquatic crops, forestry and agricultural residues, spent pulping liquor, landfill wastes, and animal wastes.³

Refuse-derived fuel — fuel that consists of municipal solid waste from which recyclable and noncombustible materials are removed so that the remaining material is used for energy production.⁴

Grease septage — material pumped from grease interceptors, separators, traps, or other appurtenances used for the purpose of removing cooking oils, fats, grease, and food debris from the waste flow generated from food handling, preparation, and cleanup.⁴

¹NCGS 143-215.10I

²NCGS Article 36C 105-449.60

³NCGS 105-129.15

⁴NCGS 130A-290, Article 9, Part 1

Danny's Dumpsters Is Growing Again

by Brian Rosa, Organics Recycling Specialist

In the Asheville area, Danny's Dumpsters has become somewhat of a household name. Danny Keaton, owner of Danny's Dumpsters, started his trash and recycling hauling business in 2007 using his 1985 Toyota van, providing the only trash and recycling collection in Madison County.



Danny Keaton, owner of Danny's Dumpster, stands with one of the company's collection trucks used in the operation of his growing recycling and composting business.

Danny's has come a long way from those days, growing the company's customer base and adding commercial food waste collection to its menu of services for the Asheville area. With more than 100 customers, the company's service includes providing 64-gallon roll carts and twice weekly collection of food waste along with all the recyclables and cardboard from its customers. Every collected container is also cleaned and sanitized before being swapped out for the filled containers.

Danny's recently faced a major challenge: the composting facility (Crowell Farms) that previously processed all its food waste closed its doors in spring 2012. Anticipating this major operational hurdle, Danny evaluated all options to rectify the situation and continue providing food collection and composting for its customers.

As Crowell Farms closed its composting operation, Danny needed a short- and long-term solution. In the short-term, Danny's continued to collect food waste from its customers and hauled the material to another compost facility, Earth Farms, more than 100 miles away in Gaston County.

"While cost-prohibitive for the long-term," Keaton explained, "I feel I must keep the program alive and not let my customer base down."

To make up for the large hauling expense, Danny's expanded services to provide food waste, recycling and trash collection at festivals and events in the Asheville area. The extra income produced from these events helps offset the cost of the extended hauling.

In the long-term, Danny's decided to build its own composting facility. With assistance from Waste Reduction Partners, the N.C. Division of Environmental Assistance and Outreach and the city of Asheville, Danny's Dumpsters secured a suitable temporary compost site on city of Asheville property. Danny selected Green Mountain Technologies' aerated static composting system for use in the new facility.

Final approval for a one-year lease for the site by the city of Asheville was completed in July 2012. The new facility should be operational by late Aug. 2012.

In addition to food waste composting, recycling traditional materials, running collection routes and planning a new compost facility, Danny is also investigating future composting solutions, including vermicomposting and Black Soldier Fly larvae composting.

For more information, contact Danny's Dumpsters' owner, Danny Keaton, at 828-380-9094 or visit <http://dannysdumpster.com/>.



Danny's Dumpsters is installing Advanced Composting aerated static bins, like the ones shown above, into its new composting operation.

Mahoney Environmental Expands to North Carolina

by Ben Rogers, *Industrial Development Specialist*

New to North Carolina, but not to oil and grease recycling, Mahoney Environmental will locate an oil recycling facility in Wendell as the newest of several company expansions. Scheduled to open Aug. 29, 2012, the new facility will hire 10 new employees when operations begin.

Mahoney began serving the Chicago food services industry in 1953, providing disposal services for used cooking oil. The company now provides complete turn-key solutions for national chain restaurants, large food processors and local independently-owned restaurants alike. The once single-service company now provides design-build, collection service and recycling for used fryer oil, grease trap, food processing effluents and meat byproducts.

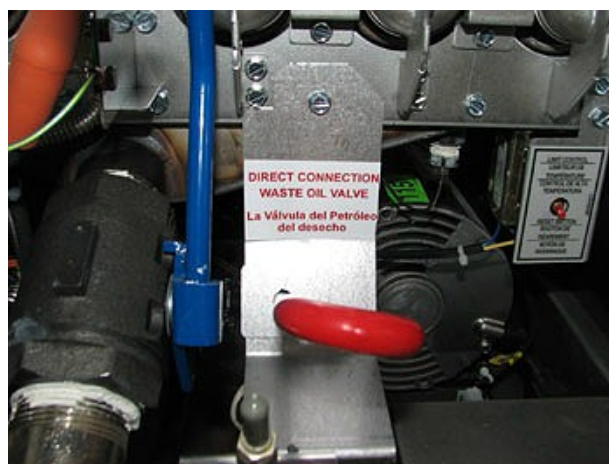
Mahoney offers a wide variety of products and services for each business line, from off-the-shelf to custom-designed installations. Depending on customer needs, products and services can be met as individual components or paired together for an integrated package.

For example, the “Fresh Cooking Oil Program” can be paired with Mahoney’s “Preferred Oil System.” When used together, restaurants seamlessly manage their



Mahoney Environmental offers a wide variety of cooking oil sourcing and recycling systems, like the Preferred Oil system seen above.

cooking oils from sourcing to disposal and recycling. Using a closed-loop model, Mahoney provides fresh cooking oil in bulk to the customer’s business. The fresh oil is held and managed by the Preferred Oil system. During use, the system manages fresh oil delivery and used oil extraction from fryers in a closed system, with options for manual and automated controls.



Mahoney Environmental offers systems that automate the handling of used cooking oils. Simple switch and lever controls, as seen above, allow used cooking oil to be pumped directly into the recycling storage container.

When the used oil reaches a specified level, a message is sent notifying Mahoney. Mahoney evacuates the used oil directly into a specialty truck and transports it to the oil recycling facility. At the facility, oils are recycled, processed and blended for a multiple of finished products. Customers receive credit for their used oil that can be used toward the purchase of fresh cooking oil. The result is one vendor handling the complete dynamics of a restaurant’s cooking oil management.

Mahoney plans to make the “Preferred Oil System” available in North Carolina in the next three to four years. “We are committed to our new venture in North Carolina,” said Greg Miller Market Area Manager, “and are excited to grow our business, grow jobs and expand the services offered here.”

Contact Area Market Manager, Greg Miller, at 800-892-9392 or gregm@mahoneyenvironmental.com, or visit <http://www.mahoneyenvironmental.com/>.

