Compendium of Organics Recovery Programs at Colleges and Universities

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Center for Environmental Policy and Management

Environmental Finance Center: Serving EPA Region 4

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Most of a university/college waste stream consists of organic material (von Kolnitz and Kaplan, 2010). This includes pre- and post-consumer food waste, campus yard debris, grass, non-hazardous animal lab waste, hand towels, paper plates, napkins, wax and paper cups, and wax and non-wax cardboard. Composting provides an alternative to incineration or landfilling organics; this can be quite dense, have a high per ton disposal cost, and release significant sources of methane when decomposing in a landfill. Compost improves soil water retention, aeration, and adds needed nutrients. It saves money spent on disposal costs and offsets the costs of buying mulch, fertilizer, and pesticides. As a teaching tool, composting methods may be worked into the curriculum of courses in areas such as sustainability, biology, soil science, ecology, and in some examples shared in this report, literature and philosophy (von Kolnitz and Kaplan, 2010).

As colleges and universities strive to reach waste reduction and recycling goals through events such as Recyclemania and in accordance with the Association for the Advancement of Sustainability in High Education (AASHE) standards, organics recovery has emerged as yet another method for waste reduction and diversion to adopt as part of sustainability plans. There are different types of existing organic waste reduction and recovery programs, with each campus using its unique characteristics to garner support from idea to implementation. Organics recovery program decision making is driven by a variety of factors such as geographic location (city, town, suburb), land availability (on-site vs. off-site), financial considerations, staff and volunteer coordination, and capacity to foster the internal and external support needed for a successful program.

Aside from accomplishing sustainability policy goals in a quantifiable sense, campus communities have a responsibility to embrace the shift that is occurring from both an individual and institutional standpoint to reduce the amount of waste entering landfills. The examples shared in this Compendium demonstrate the actions schools have taken to address the expanding interests of the campus community and how these interests have been turned into learning opportunities. The response to this demand often begins with demonstration gardening and composting at a small scale that evolves into an institutionalized system that influences a larger-scale behavioral shift among students, faculty, staff, and the surrounding community.

College campuses have countless opportunities for collecting compostable materials, and building composting systems (whether on or off-site) into campus operations is a vital part of reducing campus waste and greenhouse gas emissions. Incorporating composting into campus grounds operations, food service areas, athletic events, and other large special events is an important part of minimizing the campus waste stream.

Finished compost resulting from windrows that have cured for up to two years at Berea College's Farm in Berea, KY. This work-study college harnesses the support of staff and student labor to collect and transport food residuals from Dining Services, sort out contaminants, and establish and monitor windrows. When finished, the compost is used as a soil amendment on the campus farm.
Photo: David Adam Sizemore

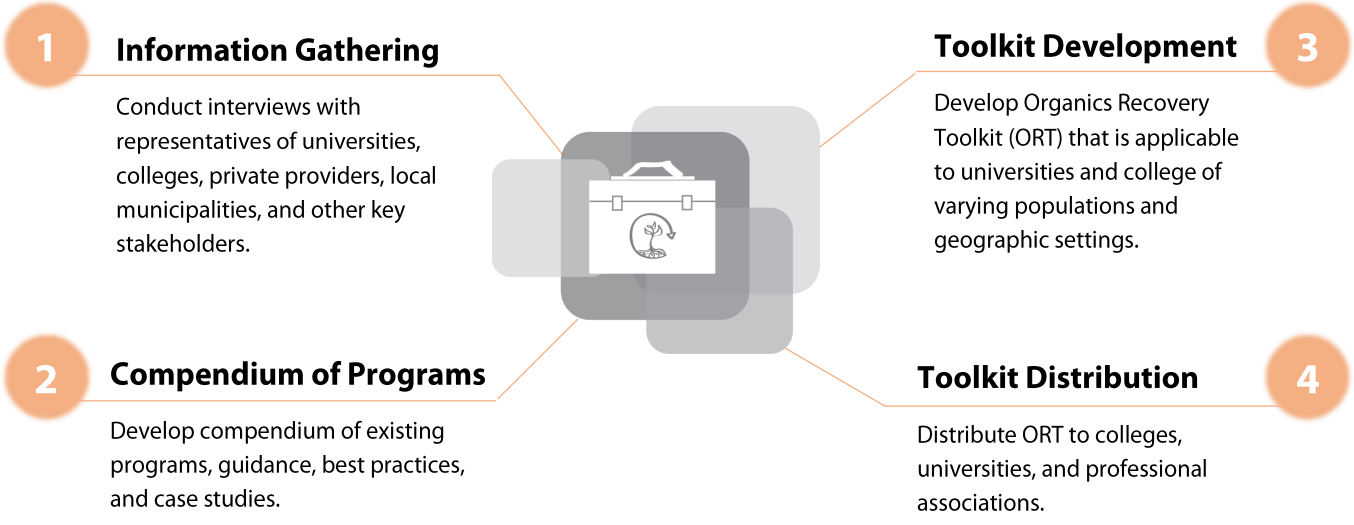
Background

This Compendium of current practices is the result of Phase I of a proposed *Organics Recovery Toolkit for Colleges and Universities*. The goal of the toolkit is to provide universities and colleges guidance in policy development, technical and economic feasibility, and implementation issues relevant to the development of sustainable management protocols for organics recovery programs. Although the focus is on institutions within the EPA Region 4 states (AL, FL, KY, MS, NC, SC, TN), this guidance will apply to institutions of varying population, density, financial condition, and cultural heritage; attention to the diversity of U.S. educational institutions is of paramount consideration.

The Compendium is based on information collected from publically available information and over 25 conversations with representatives of universities, colleges, private waste management and dining service providers, state agencies, and other key stakeholders. The initial contact listing was developed through an online search for existing university/college composting programs within EPA Region 4, suggestions from existing professional contacts, and input from EPA Region 4 RCRA Materials and Management staff. Additional points of contact supplemented our conversations through recommendations received during stakeholder interactions.

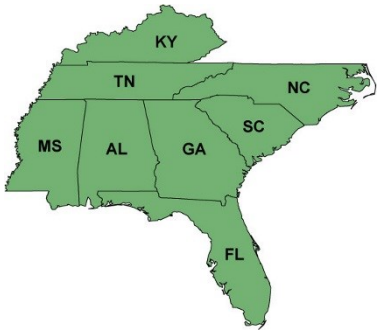
Each stakeholder shared information about their existing programming, successes, and challenges. When feasible, CEPM/EFC4 staff toured existing facilities and received added insights from a variety of perspectives; this information is included in the institutional profiles at the end of the Compendium.

The Compendium includes organics recovery program profiles for 20 schools. Future plans are to build upon this Compendium by expanding the number of institutions and breadth of information included. These profiles will serve as the foundation for the proposed **toolkit.** Ultimately, the **toolkit** will be posted to a publicly accessible website and disseminated to universities/colleges and professional networks through a variety of interactive modes that will be determined with stakeholder input.



Audience

This Compendium is intended for anyone interested in furthering organics recovery by initiating, building, and expanding composting programming in their institution. We intend to reach stakeholders with a variety of levels of knowledge. This includes post-secondary institution representatives and other related public, private, non-profit, community groups, and professional associations who might work with academic institutions in this area.



EPA Region 4

Profile Descriptions

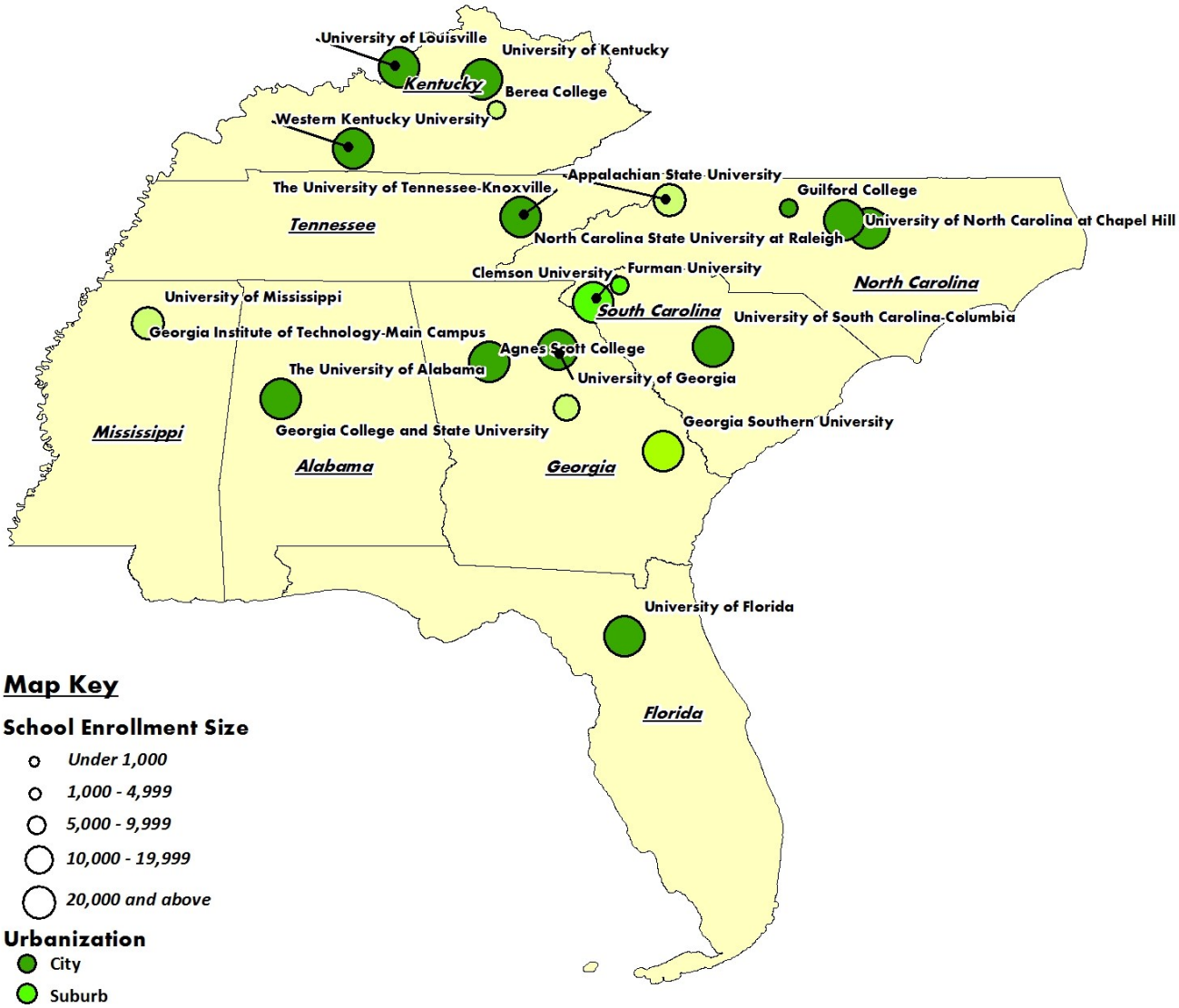
This Compendium highlights a range of characteristics, from basic to sophisticated, of both existing and planned organics recovery programs at 20 post-secondary institutions. With permission and input from institutional representatives, each profile contains information, when available, in the following categories:

- **INSTITUTIONAL PARTNERS**
- **FUNDING MECHANISMS**
- **OPERATIONAL MODEL**
- **STUDENT INVOLVEMENT**
- **ACADEMIC PROGRAMMING**
- **COMMUNITY PARTNERSHIPS**

Post-Secondary Institutions Included

Name	State	Name	State
University of Alabama	AL	Western Kentucky University	KY
University of Florida	FL	University of Mississippi	MS
Agnes Scott College	GA	Appalachian State University	NC
Georgia College and State University	GA	Guilford College	NC
Georgia Institute of Technology	GA	North Carolina State University	NC
Georgia Southern University	GA	University of North Carolina - Chapel Hill	NC
University of Georgia	GA	Clemson University	SC
Berea College	KY	Furman University	SC
University of Kentucky	KY	University of South Carolina	SC
University of Louisville	KY	University of Tennessee - Knoxville	TN

Location of Post-Secondary Institution Organics Recovery Programs Profiled



Map Key

School Enrollment Size

- *Under 1,000*
- *1,000 - 4,999*
- *5,000 - 9,999*
- *10,000 - 19,999*
- *20,000 and above*

Urbanization

- City
- Suburb
- Town

EPA Region 4 States

Variable Description

Institution size category based on total students enrolled for credit, Fall 2012

Urbanization - Locale codes identify the geographic status of a school on an urban continuum ranging from "large city" to "rural." They are based on a school's physical address. The urban-centric locale codes introduced in this file are assigned through a methodology developed by the U.S. Census Bureau's Population Division in 2005. The urban-centric locale codes apply current geographic concepts to the original NCES locale codes used on IPEDS files through 2004.

Data Sources

Institution Size - Derived - IPEDS, Spring 2013, Fall Enrollment component
Urbanization - U.S. Census Geography - April 2013/2010 Pop. Estimates

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The colleges/universities profiled in this Compendium are post-secondary institutions that offer at least four-year degree programs with enrollment ranging from under 1,000 to above 20,000. Sixteen of the 20 schools are public and the remaining four are private not-for-profit. Each school has an existing organics recovery program that includes small-scale demonstration composting efforts and/or large scale institutional efforts. Eighteen of the 20 schools have some form of on-site composting that is managed by the college/university. The following summary describes characteristics and examples of organics recovery programming and the relevance of this information for future toolkit development. Appendix A contains the tabulated summary information for each school.

The organics recovery decision-making process at post-secondary institutions is influenced by a combination of factors. **Institutional partnerships** and the identification of **funding mechanisms**, both of which determine the makeup of an **operational model** for organics recovery, are important elements of an organics recovery program. The operational model, whether on- or off-site, small- or large-scale, may function with **student involvement**, the incorporation into **academic programming**, and/or external **community partnerships**. By considering each of these factors and the unique characteristics of each school, colleges/universities can evaluate which method to adopt, who will be responsible for operations, how the program will be funded, and what type of added involvement is best from students, faculty, and the surrounding community.

Institutional Partnerships: Schools' initial program implementation depended on demonstrated political will, partner commitments, and financial support from internal and external sources. The majority of programs contain partnerships among facilities management, dining services, sustainability programming, and the student population. Only four institutions mentioned a special committee or council that meets regularly to oversee organics recovery. Other participating partners included administration, faculty/staff/offices, garden/farm/arboretum, residence halls, and other external sources. Sometimes implementation comes from grassroot student initiative, such as the program at Georgia College and State University (GCSU), Milledgeville, GA. Here, students advocated for, planned, and assisted with the program organization. Funding was made available through the *Student Green Fund*, where students submitted a funding proposal that included a cost-analysis to determine feasibility and an implementation plan. Other programs began as a result of staff and administrative support based on existing waste reduction goals as part of the college/university's sustainability policy and agreement to allocate the funds toward implementation. Regardless of the source of the initial idea, the implementation requires internal partnerships across the institution.

INSTITUTIONAL PARTICIPANTS

The following internal institutional participants were identified by the 20 schools as contributors to their existing organics recovery programs:

Administration
Committee/Council
Dining Services
External Sources
Facilities Management
Faculty/Staff/Offices
Garden/Farm/Arboretum
Residence Halls
Students
Sustainability Program

Funding Mechanisms: The majority of organics recovery programs (18 of 20) identified and allocate funding for organics recovery through existing operational budgets. At every school with food waste collection at dining facilities, the responsibility to sort and dispose of food waste falls to kitchen staff with limited sorting occurring by consumers. Dining service partners range from in-house staff to contractor services such as Aramark or Sodexo. Once food waste is collected, the transportation of food waste is conducted by either dining service, facilities management staff time, and, in some cases, student

labor. Other sources of funding for program implementation are external such as state grants. For example, a North Carolina Department of Environment and Natural Resources grant provided start-up funding for the North Carolina State University (NC State), Raleigh, NC, organics recovery program, Clemson University (Clemson), Clemson, SC, received a South Carolina Department of Health and Environmental Control grant for the purchase of an in -vessel unit, and Furman University (Furman), Greenville, SC, received a grant through the Collegiate Recycling Grant Program of the Solid Waste Management Trust Fund that also funded the purchase of an in-vessel unit. At University of Louisville (UofL), Louisville, KY, financial support for a composting demonstration effort comes from a local coffee shop chain to pick-up and transport coffee ground waste from each coffee shop to the UofL composting facility at the physical plant department each week. Six of the 20 programs rely on donated time and physical labor from faculty, staff and students as well as equipment of various sorts.

Type of Organics Recovery: Eleven of the 20 schools only employ on-site organics recovery while the remaining nine schools employ more than one method. The most popular on-site method is windrow style. Schools with lower enrollment and less overall food waste implement both demonstration and institutional composting as one entire operation. Some examples include Furman (bin-system and in-vessel), Berea College (Berea), Berea, KY, (windrow style), and Guilford College (Guilford), Greensboro, NC, (in-vessel and windrow).

Larger schools have been successful with implementing both demonstration and institutional composting if the land, staff time, and equipment is available. Examples include: University of Georgia (UGA), Athens, GA, (windrow style); University of Mississippi (OleMiss), University, MS, (windrow style); Appalachian State University (App State), Boone, NC, (forced aeration); Clemson (windrow style, static aerated pile, in-vessel, larvae/black soldier fly, and vermiculture); and the University of Tennessee, Knoxville (UT), Knoxville, TN, (windrow style). Whether large or small, all the aforementioned schools demonstrate the possibility of operational models that serve the purposes of overall waste reduction, and furthering education/research that is emblematic of post-secondary institutions.

Operational models also depend on the availability of waste hauler and commercial facilities to receive organic waste. Schools in Tennessee and Mississippi conduct on-site composting due in large part to the lack of available commercial facilities within a reasonable distance. Other schools, such as Agnes Scott College (Agnes Scott), Decatur, GA, haul compost to a distant off-site location because of a lack of available land on-site. This additional transportation results in additional fiscal and environmental impacts. For those schools with nearby commercial facilities, many have organics hauled and treated off-site. Some examples include the University of Florida (UF), Gainesville, FL, the Georgia Institute of Technology (GT), Atlanta, GA, the University of North Carolina at Chapel Hill (UNC), Chapel Hill, NC, NC State, and UofL. While each of these schools have experienced success with commercialized composting, NC State is currently conducting a feasibility study to convert their operational model from off-site to on-site organics recovery. This study will also quantify the impact of an on-site conversion on greenhouse gas emissions and waste reduction goals.

TYPE OF ORGANICS RECOVERY

The 20 schools practicing organics recovery employ the following types of organics recovery methods, with many employing multiple methods:

Windrow Style	11
Bin-System	7
In-Vessel	4
Vermiculture	3
Compost Tea	2
Aerated Static Pile	1
Biodigester	1
Forced Aeration	1
Larvae/Black Soldier Flies	1

Organics Recovery Source: Regardless of whether a college/university's organics recovery program is on - or off-site, every school contributes organics that are sourced from many different internal sources. Seventeen of the 20 schools collect food waste from dining services on campus. This may include large dining services, food courts, and other retail food establishments. Other sources are from leaf and limb waste collected during landscaping and grounds operations and campus gardens and farms. UF sources waste from large special events, such as athletic events. UG has piloted a voluntary *Green Office Program* that collects food waste from buildings on-campus. App State and Clemson both have achieved participation of retail food establishments at campus food courts. UNC, Clemson, and Guilford have all established programs to collect food waste from residence halls on-campus. Other sources include animal bedding, manure, animal mortalities (University of Kentucky (UK), Lexington, KY), and some bring in external community waste.

STUDENT INVOLVEMENT

The schools identified student participating in on- and/or off-site composting occurring in the following program types:

Coursework	9
Internships	12
Outreach/Awareness Building	8
Planning of Program	5
Volunteer	14
Work Study	3

Student Involvement: Students have a variety of roles throughout the organics recovery process in 19 of the 20 schools profiled in the Compendium. Thirteen of the 20 schools have internship/work study positions that focus the students' work anywhere from composting operational duties to conducting education and outreach among the campus community. For example, at Berea, students are expected to work 10-15 hours per week with the tasks of collecting and transporting food residuals, sorting out contaminants, establishing and monitoring windrows, and process the compost to be used as a potting medium. Other participation is through coursework, volunteerism, and planning of the organics recovery programming. At NC State, students contribute waste for a pilot pizza box composting program and build awareness to efforts via videos and online social media.

Academic Programming: Student and faculty participation through coursework, service learning, and research is also an integral part of organics recovery at post-secondary learning institutions. Fifteen of the 20 schools have research or course curricula that focus on organics recovery with some programming centered on service learning and the development of research publications. Clemson has both faculty research groups and approximately 50 students per year who participate in a service learning course called *Creative Inquiry* and through other specialized coursework. UofL also incorporates organics recovery into coursework, as students in Business Ethics study composting as a sustainable community model and contribute labor as part of the course's service learning requirements. In addition, faculty at land grant universities such as NC State, and UK produce research based informational publications on composting methods.

Community Partnerships: The participation of external community partners is another aspect of organics recovery that influences the success of a program. The colleges/universities engage and leverage resources of the surrounding community through initial program and operations planning meetings, by offering educational and learning opportunities, or by making the finished compost product available for free or for purchase. For example, initial composting efforts at UF were influenced to adopt their own programming by learning about the implementation of local municipal and grocery chain composting program. When Agnes Scott considered alternative compost contractors due to business turnover, they tapped into existing

networks, partnerships with other local post-secondary institutions, and the surrounding local municipal government. While information gathering and networking is helpful for program decision-making, colleges/universities also use existing programming to give back to the community. Furman provides public organics recovery programs such as summer workshops and adult learning opportunities. Six of the 20 schools offer compost to the community free-of-charge, while two offer compost for purchase.

This summary and the supplemental profiles are just a small sampling of the many schools nationwide that conduct organics programming; all have lessons to share. The overriding theme among each college/university profiled here is that each has unique characteristics that influence the way their program originated and how it functions. Institutions need to be well aware of the context in which they operate and build on existing capacities. Other external factors such as availability of commercial facilities and state regulations need to be explored in more depth. Another lesson is that not one procedure/practice in the streamlined organics recovery toolkit can apply to every institution. Given the diversity of programming, it is clear that an on-going, systematic compilation of best practices can help schools establish criteria for organics recovery programs that suit their specific needs. Furthermore, the broad program characteristics specified here provide a framework for schools to develop and expand existing organics recovery while simultaneously addressing the identified common needs and challenges.

METHODS OF ORGANICS RECOVERY

The methods and scales of organic recovery programming vary across each school. However the size of the institution does not necessarily dictate the scale of the organic recovery program; some campuses employ several methods of composting that are both institutional (large-scale) and demonstration (small-scale) and/or combinations of both. The profiles of schools document common practices and program type variation. Below we describe common program types, methods, and source inputs to demonstrate the variability and potential that exists in organics recovery.

LOCATION AND SCALE

Demonstration Composting (small-scale) is ordinarily coupled with demonstration gardens/farms and refers to composting that is visible to individuals while showcasing how to compost at home or other locations. Composting assistance is generated through volunteers, interns, and at times paid staff.

Institutional Composting (large-scale) refers to composting efforts that the college/university manages from large-scale sources. Examples of this include waste recovery from campus dining services, grounds department, and waste management facilities.

Off-site organics recovery is when compostable materials are transported off-campus to a secondary location not managed by the school.

On-site organics recovery is conducted directly on the school's campus or a college/university-owned facility.

METHODS

Aerated Static Piles consists of placing large piles of compost (non-windrow) over pipes so the air has the ability to circulate. This is a popular form of composting because the design structure is fairly simple, there is low operation labor, and lower capital costs then other forms of composting (U.S. Environmental Protection Agency [EPA], 2002).

Anaerobic Digestion is a process where microorganisms break down organic materials in the absence of oxygen, thereby producing biogas and soil amendments. Biogas can be used as a source of energy similar to natural gas (EPA, 2015). An example includes the use of a biodigester.

Bin-System is a small- scale operation where organic waste is placed into containers or bins in order to retain the heat and moisture from compost. Commonly, bin-system composting is built from either wooden pallets, chicken wire, recycled lumber, and/or concrete blocks to make a four-sided container (EPA, 2009).

Black Soldier Flies, Larvae Composting is similar to vermiculture composting (see below) but instead of worms, black soldier fly larvae are used. This type of composting has numerous benefits. For example, these flies eat a wide-range of food waste and black soldier fly larvae lowers disease threats in compost because they prevent unwanted insects from laying/hatching eggs in the compost (Bullock et. al., 2013).

Compost Tea is derived by steeping finished compost to extract the liquid residue. Compost tea is a beneficial asset to enriching soil due to its high amounts of microorganisms (Pane et. al. 2012).

In-Vessel composting is generally used to isolate organic waste into a container, such as a drum, silo, or even an enclosed building. In-vessel containers control the oxygen, temperature, and moisture level of the compost (Cooperband, 2002). These containers also have a tool that is used to turn the compost periodically (BioCycle, 2011).

Vermiculture uses red worms that are placed in the organic material to assist with the decay of the organic waste. The requirements for vermiculture composting include worms, worm bedding, organic matter, and a bin to keep the worms enclosed (Dabbs, 2009).

Windrow Style is placing organic waste in long, narrow piles that allows waste to form compost. Windrows are the most common form of composting nationally due to their low operation

COMPOST SOURCE INPUTS

Carbon and/or nitrogen rich inputs are captured from different sources. Each institution featured in this Compendium collected a form of food waste from the dining facilities, whether pre- or post-consumer waste, or both. Some schools capitalize on large special events and existing campus operations (i.e., community gardens and campus farms located in or around campus) to collect organics waste. Other schools have agreements with surrounding community organizations to receive and convert waste to finished compost for use on and off-campus. Examples of source inputs described in the profiles include:

Campus Gardens/Agricultural Farm are sources for campus produce and livestock and both produces and uses organics waste. These are managed and operated by students, faculty, and staff, can be curriculum or agricultural degree driven, attached to a campus program (sustainability, green initiative, healthy foods), or organized by a campus-based volunteer organization. These gardens and farms range in scale from small operations that produce small yields to large-scale operations where the production is much higher.

Dining Services prepare and serve food to campus students, faculty, and staff. Food services may be operated through contract services or managed and operated by the college/university.

Leaf and Limb are carbon sources for compost that is collected by grounds and landscaping staff or provided by outside local businesses. Leaf and limb collection is normally in the form of wood chips, leaves, limbs, or sawdust.

Off-Campus refers to composting sources that did not fall into other compost source categories. One example would be organic refuse from local surrounding businesses such as coffee shops or solid waste collection organizations. Also included in this category are off-campus arboretums, livestock/animal mortalities, animal bedding, and manure.

Office food waste is collected from campus building offices. This is brings more administrative staff into the programs and can increase compost inputs.

Residence Hall/Dormitory food waste is collected and transferred to another location as compost inputs.

Special Events are campus-wide events used to target and recruit students, faculty, staff and/or community members into organics waste procedures and recycling education. These consist of campus-wide recycling at events with high attendance (such as athletic games), programs established at residential halls to promote composting, or creating special opportunities for individuals to donate time and efforts to campus composting programs.

Kitchen staff, a university-run dining service at the University of Alabama unload pre-consumer food waste at the college arboretum where it cures over a period of 6-8 months in windrows.
Photo courtesy of University of Alabama

Furman University collects food waste from the dining hall and combines with leaf and limb waste in both bin- and in-vessel systems. Here a student intern has transported food waste and is adding it to one of the bins on the Furman Farm.
Photo courtesy of Furman University

INSTITUTIONAL PARTNERS

When planning and implementing an organics recovery program, it is best to involve various campus departments and internal participants. Departmental organization and nomenclature of each college/university varies. The profiled institutions reveal the following categories of partners and participants engaged in their programs:

Administration is the high-level college/university departmental support of an organics recovery program. This includes maintenance of the program grounds and facilities, financial services, and/or other assistance to the overall program.

Committee/Council oversees and assists in the operations of the composting program. Committee/council members act as stakeholders of the program and often consist of a group of individuals that oversee the functioning, funding, operations, and other aspects of the composting program. These committees/councils are located within offices of sustainability, special composting councils, internal staff and faculty-run councils, and student-run councils.

Dining Services prepare and serve food to campus students, faculty, and staff and can either be the sole participant in operating composting procedures or a secondary participant that helps the college/university with their organics recovery. They can be internal to the organization or contracted out. The primary food service companies discussed in the profiles are Aramark and Sodexo. Other food services referenced are Bama Dining and Carolina Dining Services.

External Stakeholders are entities from outside of the college/university system that contributes to the organics recovery operations. Examples include community support (residents), organizations, businesses and/or waste management facilities.

Facilities Management are staff dedicated to the operation and maintenance of organics recovery programming. Departments and positions include grounds and landscaping, waste reduction and recycling, or farm/garden managers. Compost-related duties include leaf and limb collection, transportation of food waste/carbon source, monitoring and turning of compost. In some cases, finished composting is used by grounds and landscaping crews in their maintenance of campus grounds.

Faculty/Staff/Office lend assistance to colleges/universities organics recovery efforts. As institutional participants, these individuals have the opportunity to work directly with composting efforts, conduct research, volunteer, or even help to establish the creation of the program.

Internal Producing Partners refers to any operation that produces food within the college/university that are not part of food services; most often these are campus gardens or farms. Internal producing participants help with organics waste recovery through storing or using the final compost to produce future products.

Residence Halls refers to college/university buildings containing living quarters for students residents who contribute to food waste collection.

Students enrolled at the college/university whether they live on or off-campus may participate through volunteer work hours, student internships, course work, or outreach and awareness building. Students can also be the sole participants in the operation by designing and operating the entire organics recovery program.

Sustainability Programs are multi-faceted programs that incorporate sustainable practices in all aspects of college/university programs, policies, and operations. A sustainability program can either be the sole participant in operating composting procedures or a secondary participant that assists with campus organics recovery.

FUNDING MECHANISMS

The profiles contain information about funding organics recovery programming – from initial capital investment to operational budgeting and the donation of volunteer time and equipment. Future iterations of this Compendium and toolkits will expand upon this area. The funding source types of the profiled programs include the following:

Internal Operational Budget is allocated from existing institutional operational budgets. This funding can come from the college/university's overall budget, departments, student fees, or facility services such as dining services.

Donated Time/Equipment/Work examples include volunteer time from clubs, student groups, required coursework activities, and donated supplies and equipment.

Incoming Funding/Resources: Refers to funding and resources that are external to the college/university and not a part of their overall internal operational budget. Examples in the profiles include external private waste management facilities that pick up organic waste and external organizations that bring their waste to be added to the institutions' compost. This procedure is paid for by the external organization and is then added to the overall budgeting for the composting program.

No Additional Funding indicates that the organics recovery operation is financed solely through volunteer efforts of the campus community.

OPERATIONAL MODEL

The profiles document that institutions employ unique operational models based on the combination of institutional participants, funding mechanisms, student involvement, academic programming, and community partnerships. Depending on the type of composting, the duration of the operational process for organics recovery varies from a few days to several months. Organics recovery programming may also be a combination of on-site demonstration composting at school gardens and/or larger-scale institutionalized on- or off-site composting of waste that is collected in larger quantities.

Future iterations of this Compendium and the organics recovery toolkit will contain descriptions and diagrams of operational models, enabling colleges/universities to develop programming based on models best suited to their own operational parameters.

STUDENT INVOLVEMENT

As learning institutions, students' involvement in organics recovery programming is evident whether through paid work opportunities or other volunteer efforts. Some of the more general categories of student involvement found in the profiles includes the following examples:

Course Work is an effective method to engage students in their school's organic recovery program. Course activities might include researching different methods of composting procedures or evaluating their institution's composting program. Some colleges/universities offer students the ability to incorporate organics recovery programming into an independent study course or act as a tour guide/docent at the institution's composting site(s) for course work credit.

Internships are often used to offer student employment and/or work-study opportunities. These internship responsibilities and duties are often associated with the operations and maintenance of a composting project or program while also working on the campus garden/farm.

Student Volunteer Programs are common for providing labor required for maintaining campus gardens, composting sites, and recovering individual organic waste in residential halls. Students gain experience and training through these programs.

ACADEMIC PROGRAMMING

An advantage of conducting organics recovery at post-secondary institutions is creating learning opportunities for students and faculty through coursework and hands-on research. The profiled institutions found the following ways to incorporate organics recovery into academic programing:

Research/Course Curriculum is the incorporation of composting research and course requirements into an academic programming structure. This includes course syllabi, research projects, independent studies, tours of campus farms, or faculty-based research.

Service Learning is when students, faculty, and staff teach and learn by working directly with and providing service to composting programs to gain first-hand experience in various aspects of organics recovery.

Resource/Publications about organics recovery are often produced by institutions as a result of academic programming. Colleges and universities have produced resource guides, reports, and scholarly articles on topics such as tracking program development and success, best practices, and analysis of specific techniques.

In 2011, a creative inquiry class was established at Clemson University to build momentum to the university's composting program. Faculty research groups and on average 50 students per year participate in composting through specialized coursework.
Photo courtesy of Clemson University

COMMUNITY PARTNERSHIPS

Organics recovery programs have a variety of partnerships with their surrounding communities. Examples in the profiles include the following practices:

Compost for Donation makes compost available to the surrounding community (i.e. individual households, community-based organizations, or businesses) at no cost.

Compost for Purchase makes compost available to the surrounding community (i.e. individual households, community-based organizations, or businesses) for a cost.

Community Education is an external engagement where the surrounding community is directly involved in special events or learning opportunities specific to organics recovery.

Learning Community in which institutions systematically interact with other academic institutions, and outside establishments/ organizations to exchange information that leads to strengthening organics recovery programming. Establishments/ organizations include private waste management facilities, local businesses, and municipalities.

The *Compost Machine* serves as a vehicle to pick up and transport coffee grounds, tea, and lemon rinds sourced from a local coffee chain. This type of external networking is one example of how post-secondary institutions can connect with the surrounding community. The van is a donation from the University of Louisville's Physical Plant.
Photo: David Adam Sizemore

School Profile Format Description

Illustrated below is a snapshot of the information that is found in each college/university's organics recovery profile. Categories are based both on common terms as well as unique program characteristics.

BASIC CHARACTERISTICS

Location *(City, State)*

Density* *(Town/Suburb/City)*

Enrollment Category*

under 1,000
1,000 - 4,999
5,000 - 9,999
10,000 -19,999
20,000 and above

Sector* *(Private/Public)*

Type of Organics Recovery:

On-site or off-site

Anaerobic Digestion, Bin-system, Compost Tea, In-Vessel, Larvae Composting, Static Aerated Pile, Vermiculture, Windrow Style, etc.

Source(s):

Campus gardens, dining services, leaf and limb, manure, mortalities (animal), offices, residence halls, special events, etc.

Institutional Partners

Administration, committee/ council, dining services, facilities management, residence halls, students, sustainability program, other faculty and staff departments, etc.

Funding Mechanisms

Operational budget, external funding, donated labor/ equipment, no additional funding.

Operational Model

Description of organics recovery process from sourcing to finished compost (if on-site) and responsible staff/volunteer time.

Program Highlights

Notable aspects of the organics recovery program.

Student Involvement

Internships, volunteer, course work, work study, planning, outreach.

Academic Programming

Research/course curriculum, service learning, resource/ publications.

Community Partnerships

Compost for donation, compost for purchase, networking, community engagement, no partnerships mentioned.

Online Resources

Links to websites containing additional information about programming and other college/ university-specific resources/publications that are related to organics recovery.

Contact

College/university point of contact for organics recovery programming.

** Data for the Density, Enrollment Category, and Sector derived from the Integrated Postsecondary Education Data System (IPEDS). See map on page 7 for more information about data sources and categories.*

UNIVERSITY OF ALABAMA (UA)

Location:	Tuscaloosa, AL
Density:	City
Enrollment Category:	20,000 and above
Sector:	Public
Type of Organics Recovery:	Off-site Windrow Style
Source(s):	Leaf and Limb Dining Services

INSTITUTIONAL PARTNERS

- Dining Services
- Facilities
- University of Alabama Arboretum

FUNDING MECHANISMS

Funding provided through operational budget for staff time through dining services and the arboretum. Truck for transporting donated by the university.

OPERATIONAL MODEL

The organics recovery program at UA sources carbon from leaf and limb accumulated at the university and nitrogen composed of pre-consumer produce waste that is transported to the college arboretum. At the arboretum, compost cures over 6-8 months in windrows.

STUDENT INVOLVEMENT

Composting at UA does not currently have student participation.

ACADEMIC PROGRAMMING

Composting at UA is not currently incorporated into course curriculum.

COMMUNITY PARTNERSHIPS

Finished compost is offered via advertisement to local farms, private enterprises, and the surrounding community free of charge.

ONLINE RESOURCES

Website: UA Compost

CONTACT

A.J. Delfaco
District Manager
Bama Dining
Defalco-AJ@Aramark.com

UNIVERSITY OF FLORIDA (UF)

Location:	Gainesville, FL
Density:	City
Enrollment Category:	20,000 and above
Sector:	Public
Type of Organics Recovery:	Off-site Commercial Facility On-site Windrow Style
Source(s):	Coffee Grounds and Lemons (On-site) Food Waste (Off-site) Paper Towels (Off-site) Leaf and Limb (On-site)

Photo courtesy of University of Florida

INSTITUTIONAL PARTNERS

- Athletic Association
- Building Services
- Environmental Health and Safety
- Dining Services
- Office of Sustainability
- Physical Plant Department
- Students

FUNDING MECHANISMS

Funding for composting is through operational budgeting of dining services and the physical plant department.

OPERATIONAL MODEL

Off-site composting occurs in contract with a private waste hauler and commercial facility. Physical plant handles food waste and paper towels from 48 locations on-site including dining services and large-scale athletic events. On-site composting of yard waste, coffee grounds, and lemons occurs on-site.

STUDENT INVOLVEMENT

Students participate in composting through various volunteer and extracurricular efforts such as the Student Compost Cooperative, the Gator Gardening Club, and the UF Organic Gardens Cooperative. Recently, students have submitted proposals for *Compost Education Stations* through the *Pepsi Challenge*.

ACADEMIC PROGRAMMING

Composting topics have been incorporated into course curriculum and research through capstone projects, sustainability classes, and studies on anaerobic digestion through the Institute of Food and Agricultural Sciences.

COMMUNITY PARTNERSHIPS

Initial composting efforts were influenced by the implementation of local municipal and grocery chain composting programming.

ONLINE RESOURCES

Website: Gator Dining Services Sustainability Information
Website: Institute of Food and Agriculture Sciences
Website: Recycling and Solid Waste Management
Website: Student Compost Cooperative
Website: University Athletic Association Sustainability

CONTACT

Liz Storn
Program Coordinator
Office of Sustainability
efstorn@ufl.edu
(352) 392-7578

AGNES SCOTT COLLEGE

Location:	Decatur, GA
Density:	Suburb
Enrollment Category:	Under 1,000
Sector:	Private not-for-profit
Type of Organics Recovery:	Off-site Commercial Facility On-site Bin System
Source(s):	Dining Services (Off-site) Garden Waste (On-site)

Left photo source: http://www.agnesscott.edu/sustainability/waste-diversion/compost.html, right photo source: The Eco House Residents' Guide

INSTITUTIONAL PARTNERS

- Dining Services
- Office of Sustainability

FUNDING MECHANISMS

Agnes Scott College does not receive any additional funding for the composting program, therefore it has to work within the confines of not altering the existing budget. With the composting contractor going out of business, another professional hauler was recruited to transport the compost.

OPERATIONAL MODEL

This composting system sources nitrogen composed of pre- and post-consumer waste that is transported off-site by a professional hauler to a municipal facility located in Georgia.

STUDENT INVOLVEMENT

Student residents of the *Eco House* have the ability to compost using a *Green Cone* composter. When finished the compost is used in two raised beds located on-site.

ACADEMIC PROGRAMMING

Composting at Agnes Scott is not currently incorporated into course curriculum.

COMMUNITY PARTNERSHIPS

By tapping into existing networks, partnerships with other local post-secondary institutions, and the surrounding local municipality have proven crucial for the recruitment of alternative compost contractors.

ONLINE RESOURCES

Website: Agnes Scott College Compost
Website: Office of Sustainability Eco House

CONTACT

Susan Kidd
Director of Sustainability
Agnes Scott College
sakidd@agnesscott.edu
(404) 471-6080

GEORGIA COLLEGE and STATE UNIVERSITY (GC)

Location:	Milledgeville, GA
Density:	Town
Enrollment Category:	5,000 - 9,999
Sector:	Public
Type of Organics Recovery:	*Current* -On-site Aerated Static Piles *Future* - On-site In-Vessel
Source(s):	*Current* - Leaf and Limb *Future* - Dining Services

Photo courtesy of Georgia College and State University

INSTITUTIONAL PARTNERS

- Dining Services
- Faculty (Biology and Environmental Science)
- Grounds and Landscaping Services
- Students
- Sustainability Council

FUNDING MECHANISMS

Through GC's Student Green Fund, students submitted a proposal and were awarded funding for a new program. A cost-analysis was conducted to determine feasibility. Upon implementation the composting program saves the university money, the savings will be reimbursed back into the *Green Fee* program.

OPERATIONAL MODEL

This system will source carbon from on-site leaf and limb collection and post- consumer waste from Dining Services. A new in-vessel facility will be located on-site and finished compost will be used for campus gardens and landscaping.

STUDENT INVOLVEMENT

The program was advocated for, planned, and organized by students, faculty, and staff who plan for two part-time operations staff. Outreach is conducted through the Environmental Science Gardening Clubs, and through student participation, funding has been secured through the Student Green Fund.

ACADEMIC PROGRAMMING

As part of the composting program, research on composting is incorporated into academic programming. Students can receive credits through Biology and Environmental Science courses.

COMMUNITY PARTNERSHIPS

No community partnerships mentioned.

ONLINE RESOURCES

Publication: Georgia College Campus Sustainability Plan
(includes composting goals 1 and 2 of Waste Management)
Website: Georgia College Student Green Fee
Website: Georgia College Sustainability Council
Website: Green Fee Grant Application for Composting

CONTACT

Lori Strawder
Chief Sustainability Officer
Georgia College and State University
sustaingc@gcsu.edu
(478) 445-7016

GEORGIA INSTITUTE OF TECHNOLOGY (Georgia Tech)

Location:	Atlanta, GA
Density:	City
Enrollment Category:	20,000 and above
Sector:	Public
Type of Organics Recovery:	Off-site Commercial Facility On-site Bio-digester
Source(s):	Dining Services Leaf and Limb

INSTITUTIONAL PARTNERS

- Dining Services
- Office of Environmental Stewardship
- Office of Solid Waste Management and Recycling
- Students Organizing for Sustainability (S.O.S.)

FUNDING MECHANISMS

Funding provided through operational budget for staff time through dining services and to contract compost pick-up by a private waste hauler.

OPERATIONAL MODEL

The composting program focuses on dining facility pre- and post-consumer waste that is picked up by a private waste management contractor. To further reduce the amount of solid waste from locations, a bio-digester was installed at the North Avenue dining facility.

STUDENT INVOLVEMENT

Students are involved with composting efforts through interactive waste learning where students can weigh their food waste and learn about waste reduction strategies.

ACADEMIC PROGRAMMING

Composting is not currently incorporated into course curriculum or academic research.

COMMUNITY PARTNERSHIPS

While no specific community partnerships are mentioned, finished compost is brought back to the campus where it is sold at a discounted price to individuals.

ONLINE RESOURCES

Article: Faculty/Staff Newspaper article on composting
Website: Georgia Tech Sustainability Initiatives

CONTACT

Grant Grimes
Unit Marketing Coordinator
Sustainability Coordinator
Georgia Institute of Technology
grant.grimes@sodexo.com
(404) 790-6835

GEORGIA SOUTHERN UNIVERSITY

Location:	Statesboro, GA
Density:	Town
Enrollment Category:	20,000 and above
Sector:	Public
Type of Organics Recovery:	On-site Bin-System
Source(s):	Dining Services Leaf and Limb

INSTITUTIONAL PARTNERS

- Center for Sustainability
- Dining Services
- Facilities Services
- Students

FUNDING MECHANISMS

Funding provided through operational budget for staff time through dining services, facilities services, and the Center for Sustainability (funded by student fees).

OPERATIONAL MODEL

The composting process begins in the Dining Services by collecting pre-consumer waste separated by kitchen workers. Facilities Services then transports the waste to the composting site, where it is mixed by student labor with leaves, wood chips, and fresh grass clippings. With the program beginning in summer 2015, Georgia Southern intends to use finished compost at campus facilities, including campus gardens.

STUDENT INVOLVEMENT

The composting program was student influenced, beginning with a public health project in 2009. Now, students participate with the pilot implementation of a new program and will soon apply the finished compost at campus gardens and other university facilities.

ACADEMIC PROGRAMMING

Research is conducted through course work as part of an Environmental Sustainability Concentration degree where students must solve a sustainability problem in their practicum course. Graduate students help with mixing and layering finished compost at campus gardens.

COMMUNITY PARTNERSHIPS

No specific community partnerships mentioned.

ONLINE RESOURCES

Article: University Newspaper article on campus garden
Publication: Thorne, Kacie L. Miss, "Composting: Sustainable Efforts on a University Scale" (2014) University Honors Program Theses. Paper 39.
Website: Garden of the Coastal Plain

CONTACT

Lissa Leege
Director
Center for Sustainability
Georgia Southern University
leege@georgiasouthern.edu
(912) 478-5895

UNIVERSITY OF GEORGIA (UGA)

Location:	Athens, GA
Density:	City
Enrollment Category:	20,000 and above
Sector:	Public
Type of Organics Recovery:	On-site Windrow Style
Source(s):	Dining Services Leaf and limb Offices/Departmental Break Rooms

INSTITUTIONAL PARTNERS

- Engineering Outreach Services
- Facilities Management (FM) Division Services
- FM Grounds Department
- Dining Services
- Office of Sustainability
- Students

FUNDING MECHANISMS

Initial funding for leaf and limb debris provided through external grants, College of Engineering and FM. Ongoing compost operations managed by one full-time staff in FM Grounds Department. Two paid student interns manage the office composting program through the Office of Sustainability.

OPERATIONAL MODEL

This composting system sources carbon from leaf and limb and nitrogen from dining facility pre- and post-consumer waste that is transported to the Bioconversion Center. Organics from the Green Office Program are transported to the learning and demonstration garden.

STUDENT INVOLVEMENT

Students participate in composting through paid internships (10 hours per week), student volunteer opportunities, and course requirements.

ACADEMIC PROGRAMMING

Compost operations are incorporated into faculty development opportunities and academic syllabi. Through the Bioconversion Center, biomass and biofuel research outputs serve as inputs to compost.

COMMUNITY PARTNERSHIPS

Internal partnerships exist through the Green Office Program, a voluntary program for offices to participate in composting. Interns collect coffee grounds, produce, and paper towel waste from break rooms then deliver to the on-campus learning and demonstration garden. Finished compost incorporated into local school and communities gardens.

ONLINE RESOURCES

Article: Food Waste Composting: Institutional and Industrial Applications.
Website: Sustainable UGA Recycling and Compost
Website: UGA Biorefining and Carbon Cycling Program
Website: UGArden, Learning and Demonstration Farm.

CONTACT

W. Brett Ganas
Director
Facilities Management Division Department
wbganas@uga.edu
(706) 542-3684

BEREA COLLEGE

Location:	Berea, KY
Density:	Town
Enrollment Category:	1,000 - 4,999
Sector:	Private not-for-profit
Type of Organics Recovery:	On-site Bin-System On-site Windrow Style
Source(s):	College Farm Dining Services Leaf and Limb Student Residence

INSTITUTIONAL PARTNERS

- Administration
- College Farm
- Dining Services
- Facilities Management: Recycling
- Office of Sustainability

FUNDING MECHANISMS

Initial funding provided by grants from Organic Farming Research Foundation and the Appalachian College Association. Daily operational costs shared by the College Farm and Dining Services. Ongoing capital investments come from special request to College's administration and grants.

OPERATIONAL MODEL

This composting system sources carbon from leaf and limb provided by a local tree service and nitrogen from Dining Services pre- and post-consumer waste that is transported to the college farm. On the farm, windrows are turned regularly with finished compost for use as a soil amendment on the campus farm.

STUDENT INVOLVEMENT

As a work college, student are expected to work 10-15 hours per week. Tasks of the composting program include collecting and transporting food residuals, sorting out contaminants, establishing and monitoring windrows, and processing the compost to be used as a potting medium. Residents of the Eco-Village, a sustainable residential community, may compost on-site.

ACADEMIC PROGRAMMING

Students in various programs use the composting operation for laboratory and class activities as well as undergraduate research. It is also part of the farm tour for prospective students and visitors.

COMMUNITY PARTNERSHIPS

Finished compost is recycled to the campus farm. Carbon inputs are received through a partnership with a local tree service, that disposes of leaf and limb to the campus.

ONLINE RESOURCES

Video: Berea College Composting Program
Website: Ecovillage
Website: Food Waste Composting
Website: Office of Sustainability

CONTACT

Cait McClanahan
Sustainability Manager | Berea College Dining
caitlin_McClanahan@berea.edu | (859) 985-3992

Janet Meyer
Horticulture Manager | Berea College Farm
janet_meyer@berea.edu | (859) 625-4610

UNIVERSITY OF KENTUCKY (UK)

Location:	Lexington, KY
Density:	City
Enrollment Category:	20,000 and above
Sector:	Public
Type of Organics Recovery:	*Current* - On-site Windrow Style
Source(s):	Animal Bedding Animal Manure Leaf and limb Livestock Wood Chips

Source: ID-166 "On-Farm Composting of Animal Mortalities." UK Cooperative Extension Service

INSTITUTIONAL PARTNERS

- Administration
- College of Agriculture, Food and Environment
- Cooperative Extension Service
- Faculty
- Students

FUNDING MECHANISMS

Funding sources for composting through operational budget include one full-time staff member who manages windrows. All equipment, with the exception of the compost turner, are used for other functions.

OPERATIONAL MODEL

Currently, windrow mortality composting occurs at a university-owned farm sourced by animal bedding, manure, wood chips, and animal mortalities (beef, hogs, sheep, horses). Farm staff devote part-time to the management of windrows. The finished compost is used for agricultural operations at the farm. Future plans include composting dining service waste.

STUDENT INVOLVEMENT

College of Agriculture students may tour the composting facility as part of coursework.

ACADEMIC PROGRAMMING

The UK Extension Service has produced multiple publications resulting from experimentation including On-Farm Composting of Animal Mortalities and the On-Farm Disposal of Animal Mortalities.

COMMUNITY PARTNERSHIPS

Composting site at farm is used to demonstrate the process to interested parties such as the Humane Society, county public works staff, and local entrepreneurs. The UK Cooperative Extension Service has produced publications and factsheets on home composting.

ONLINE RESOURCES

Publication: ID-166: On-Farm Composting of Animal Mortalities

Publication: ID-167: On-Farm Disposal of Animal Mortalities

Website: UK College of Agriculture Composting Info

CONTACT

Steve Higgins
Director of Environmental Compliance for Agricultural Experiment Station
shiggins@uky.edu | (859) 218-4326

Shane Tedder
Sustainability Coordinator
shane.tedder@uky.edu | (859) 257-0014

UNIVERSITY OF LOUISVILLE (UofL)

Location:	Louisville, KY
Density:	City
Enrollment Category:	20,000 and above
Sector:	Public
Type of Organics Recovery:	Off-site Commercial Facility On-site Converted Bin-System On-site Vermiculture
Source(s):	Animal Bedding (Off-site) Community Compost (On-site) Dining Services (Off-site) Leaf and Limb (On-site)

Source: UofL EcoRepss Facebook page

INSTITUTIONAL PARTNERS

- Athletics
- Campus Housing
- Dining Services
- Physical Plant
- Office of the Provost
- Students and Faculty
- Sustainability Council

FUNDING MECHANISMS

Funding for off-site composting provided through dining services operational budget . Funding for on-site composting provided through a stipend for administrative costs and other support received from UofL Sustainability Council's Climate Action Plan budget, Heine Bros Coffee, and the Partnership for a Green City.

OPERATIONAL MODEL

Off-site pre-and post-consumer food waste is handled first by dining services and then a private contractor. On-site composting is conducted using reclaimed dumpsters as bins that are aerated on a periodic basis and supplemented with vermiculture.

STUDENT INVOLVEMENT

Student participation is robust, though episodic. In 2012-2013 alone, over 500 students have volunteered at the on-site composting facility. Student labor is also sourced from Bellarmine University, another local post-secondary institution.

ACADEMIC PROGRAMMING

Students in Business Ethics study composting as a sustainable community model and contribute labor as part of the course's service learning requirements. Students in a variety of classes are also involved through campus sustainability tours and EcoReps trainings.

COMMUNITY PARTNERSHIPS

The on-site project picks up from community partners, notably a local coffee chain, and provides compost to community gardens, non-profits, and individuals. Recently, technical and planning support was provided to a local nature preserve to implement a similar program.

ONLINE RESOURCES

Website: UofL Sustainability - Composting

CONTACT

Brian Barnes
Eco-Reps Director
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brian.barnes@louisville.edu | (502) 338-1338

Justin Mog
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WESTERN KENTUCKY UNIVERSITY (WKU)

Location:	**Bowling Green, KY**
Density:	**City**
Enrollment Category:	**20,000 and above**
Sector:	**Public**
Type of Organics Recovery:	**Off-site Windrow Style**
Source(s):	**Dining Services** **Leaf and Limb**

Photo: WKU Photographer Bryan Lemon

INSTITUTIONAL PARTNERS

- Dining Services
- Facilities Management
- Office of Sustainability
- Private Waste Hauler

FUNDING MECHANISMS

Funding sources for on-site composting is through the operational budget for dining services and facilities management. With the renovation of Dining Services, an engineer was contracted to produce plan for logistics.

OPERATIONAL MODEL

On-site composting is sourced from dining hall pre- and post-consumer pulped food waste. It is then delivered by the university's waste and recycling service to the WKU Baker Arboretum where it is combined with wood chips in windrows. Finished compost is used on-site at the arboretum and small amounts are used at Project Grow, a student run demonstration garden.

STUDENT INVOLVEMENT

Students participate at the arboretum to test the nutritional content of compost. Student fellowships are also offered through the Project Grow program, a demonstration garden that utilizes finished compost as a soil amendment.

ACADEMIC PROGRAMMING

Composting is not currently in any course requirements at WKU.

COMMUNITY PARTNERSHIPS

The on-site composting currently occurs within the WKU network.

ONLINE RESOURCES

Article: WKU Composting Food Waste from Fresh Food Co.
Facebook Page: Project Grow (demonstration garden)
Website: Baker Arboretum

CONTACT

Christian Ryan
Sustainability Coordinator
Office of Sustainability
christian.ryan@wku.edu
(270) 745-2508

UNIVERSITY OF MISSISSIPPI (UM/Ole Miss)

Location:	University, MS
Density:	Town
Enrollment Category:	10,000 - 19,999
Sector:	Public
Type of Organics Recovery:	On-site Windrow Style
Source(s):	Dining Services Leaf and Limb

INSTITUTIONAL PARTNERS

- Composting Advisory Committee
- Dining Services
- Office of Sustainability
- School of Pharmacy
- Students

FUNDING MECHANISMS

Funding for composting is provided primarily from the Green Fund for operations and student wages. The Office of Sustainability also contributes to student wages and other expenses. Dining Services also provides funds for marketing when needed.

OPERATIONAL MODEL

On-site composting includes waste products such as pre-consumer food waste from dining halls and leaf and limb waste from campus grounds that decompose on-site. The finished compost is used as a soil amendment at various gardens on- and off-site.

STUDENT INVOLVEMENT

The composting program began as a pilot program with student participation and now operates with four interns. Outreach includes postings and articles in university publications, tabling at the sustainability fair each year, and information on napkin dispensers in dining halls.

ACADEMIC PROGRAMMING

A civil engineering class conducted a greenhouse gas analysis as part of a course project.

COMMUNITY PARTNERSHIPS

The on-site composting occurs fully on campus facilities. The university advertises compost for personal garden use via the web.

ONLINE RESOURCES

Website: Composting at Ole Miss
Website: Green Student Intern Program
Website: The Maynard W. Quimby Medicinal Plant Garden
Website: The UM Green Fund

CONTACT

Lindsey Abernathy
Project Coordinator
Office of Sustainability
lmphill2@go.olemiss.edu
(662) 915-3442

APPALACHIAN STATE UNIVERSITY

Location:	Boone, NC
Density:	Town
Enrollment Category:	10,000 - 19,000
Sector:	Public
Type of Organics Recovery:	*Current* - On-site Forced Aeration
Source(s):	Dining Services Football Stadium Large Campus Events Student Union Events

Photo courtesy of Appalachian State University

INSTITUTIONAL PARTNERS

- Administration
- Design and Construction
- Dining Services
- Physical Plant
- Students
- Sustainability Office
- Sustainable Development
- Technology Department

FUNDING MECHANISMS

Funding sources for composting through operational budget of Facilities Services.

OPERATIONAL MODEL

On-site composting includes waste products such as food waste from dining halls, coffee shops, the food court, and other food–related facilities. All waste is then transported to the forced aeration composting facility. When finished, compost is used for landscaping and the university farm.

STUDENT INVOLVEMENT

Composting began as a student-driven initiative. In Spring 2000, Sustainable Resource Management students in the Appropriate Technology department added aeration to the static pile composting operation. Today, students participate through internship opportunities.

ACADEMIC PROGRAMMING

With a new state of the art facility, the scope of research and hands-on learning opportunities has expanded.

COMMUNITY PARTNERSHIPS

The on-site composting occurs fully on campus facilities.

ONLINE RESOURCES

Website: Campus Composting
Website: Physical Plant Compost and Sustainable Practices

CONTACT

Jen Maxwell
Sustainability Program Specialist
Office of Sustainability
Appalachian State University
maxwelljb@appstate.edu
(828) 262-2667

GUILFORD COLLEGE

Location:	Greensboro, NC
Density:	City
Enrollment Category:	1,000 - 4,999
Sector:	Private not-for-profit
Type of Organics Recovery:	On-site Compost Tea On-site In-Vessel On-site Vermiculture On-site Windrow Style
Source(s):	Campus Buildings Campus Farm Dining Services Leaf and limb

Photo courtesy of Guilford College

INSTITUTIONAL PARTNERS

- Campus Farm
- Dining Services
- Housekeeping Staff
- Residence Halls
- Students
- Sustainability

FUNDING MECHANISMS

Funding sources for off-site composting is through the operational budget for dining services , sustainability, and housekeeping staff time.

OPERATIONAL MODEL

On-site composting includes waste products such as food wastes from the dining hall, campus buildings, campus farm, fallen leaves from grounds and sawdust from the sawmill operation. The finished compost and compost tea is used as fertilizer on campus grounds and farm.

STUDENT INVOLVEMENT

Student participation includes work-study and independent study. Food waste reduction awareness and education occurs at campus dining services

ACADEMIC PROGRAMMING

Students have chosen to focus on composting through independent studies. *First Year Experience* class also exposes students to sustainability efforts. Practicum in Sustainable Agriculture is another class currently offered. Students soon may major in a Sustainable Food Systems degree where composting will be an element of the program.

COMMUNITY PARTNERSHIPS

The on-site composting occurs fully on campus. Community partnerships are of interest in the future if compost could be sold to the general public.

ONLINE RESOURCES

Video: Food Waste Management at Guilford College
Website: Guilford Sustainability

CONTACT

David Petree
Director of Environmental Sustainability
Sustainability
dpetree@guilford.edu
(336) 316-2402

NORTH CAROLINA STATE UNIVERSITY (NC State)

Location:	Raleigh, NC
Density:	City
Enrollment Category:	20,000 and above
Sector:	Public
Type of Organics Recovery:	*Current* Off-site Commercial Facility *Future* Exploring feasibility of On-site
Source(s):	Dining Services Leaf and Limb Offices Residence Halls (pizza boxes)

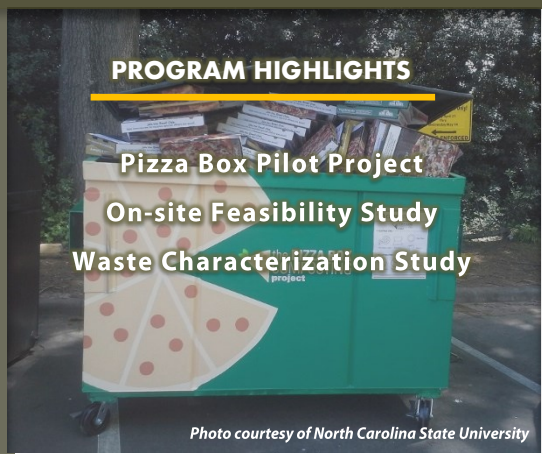

Photo courtesy of North Carolina State University

INSTITUTIONAL PARTNERS

- College of Veterinary Medicine
- Dining Services
- Grounds Management
- Horticultural Field Labs
- Students
- University Housing
- Waste Reduction and Recycling Office

FUNDING MECHANISMS

Funding sources for off-site composting is through operational budget for staff time. NC State received a North Carolina Department of Environment and Natural Resources grant for the funding of organics recovery.

OPERATIONAL MODEL

Compost inputs are sourced from Dining Services (pre- and post-consumer waste), and in dormitories through a pilot pizza box program. These boxes are collected and transported to a commercial compost facility. For alternative composting considerations, a feasibility study is being conducted to examine the benefits and costs of shifting composting to on-site facilities.

STUDENT INVOLVEMENT

Students have participated in a pilot pizza box composting program and in composting efforts through volunteerism and internships. A student intern oversees and creates volunteer opportunities for the campus and community at the compost training facility.

ACADEMIC PROGRAMMING

Biological and Agricultural Engineering, faculty provide presentations, training courses, workshops, and publications on solid waste management, vermicomposting, composting, and recycling to the university and communities worldwide.

COMMUNITY PARTNERSHIPS

As a land grant institution, NC State offers education and informational materials on composting to the general public. The university also hosts a training course through the NC Composting Council.

ONLINE RESOURCES

Website: Biological and Agricultural Engineering Composting
Website: NC State Vermicomposting
Website: Pizza Box Composting Project website

CONTACT

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UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL (UNC-Chapel Hill)

Location:	Chapel Hill, NC
Density:	City
Enrollment Category:	20,000 and above
Sector:	Public
Type of Organics Recovery:	Off-site Windrow Style On-site Bin-System
Source(s):	Campus Garden Dining Services Leaf and Limb Residence Halls Special Events

Source: flickr username: Carolina Campus Community Garden

INSTITUTIONAL PARTNERS

- Carolina Campus Community Garden (CCCG)
- Department of Biology Greenhouse
- Department of Housing and Residential Education
- Dining Services
- Residence Hall Association
- Student Government Environmental Affairs Committee
- Students
- Waste Reduction and Recycling

FUNDING MECHANISMS

Funding sources for on- and off-site composting are through operational budget for staff time, student internships, and to contract compost pick-up by a private waste hauler.

OPERATIONAL MODEL

Existing compost inputs are sourced from dining areas, residence halls (opt-in) and large events. Dining, event, and greenhouse organics are collected and transported to a commercial compost facility. Residential food waste is transported to the campus' community garden, which composts using an eight-bin system.

STUDENT INVOLVEMENT

Students participate through the ResHall Composting pilot program, an opt-in program where participants check out a small compost collector for personal use. Students have also participated through internship and Capstone studies. Active environmental student groups, such as Epsilon Eta, and the Environmental Honors Fraternity, organize peer education campaigns around food waste reduction and composting.

ACADEMIC PROGRAMMING

Students have chosen to focus on composting in Capstone and other coursework. UNC's two-year pan-campus theme, Food for All: Local & Global Perspectives, provides students, staff, and faculty opportunities to educate about composting as part of the sustainable food system.

COMMUNITY PARTNERSHIPS

The CCCG accepts compost donations from community members, faculty, staff, students and everything in between.

ONLINE RESOURCES

Website: CCCG Compost Donations
Website: Carolina Green Events
Website: Compost Program Overview
Website: ResHall Composting Pilot Program
Website: Waste Reduction and Recycling Reporting

CONTACT

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CLEMSON UNIVERSITY

Location:	Clemson, SC
Density:	Suburb
Enrollment Category:	20,000 and above
Sector:	Public
Type of Organics Recovery:	On-site In-vessel On-site Larvae/Black Soldier Flies On-site Static Aerated Piles On-site Vermiculture On-site Windrow Style
Source(s):	Dining Services Leaf and limb Residence Halls

INSTITUTIONAL PARTNERS

- Agricultural Services
- Dining Services
- Facilities
- Faculty
- Organic Farm
- Students

FUNDING MECHANISMS

Initial funding was a $25,000 grant; 50% of these proceeds went toward an in-vessel unit. Composting operations is funded through operational budget for one full-time staff member who devotes part-time to composting.

OPERATIONAL MODEL

Food waste is retrieved daily from dining halls, food courts, and other buildings. Waste is transported to the Cherry Crossing Research Center, one mile from campus, where various organics recovery methods are employed. Finished compost sold or exchanged for volunteer labor.

STUDENT INVOLVEMENT

Students initiated composting through graduate assistantships. Campus wellness groups and Eco-reps participate in efforts through volunteer hours. Residents at eight student apartments had the opportunity to participate in a pilot composting program.

ACADEMIC PROGRAMMING

Faculty research groups and approximately 50 students per year participate in composting through a Creative Inquiry class and other specialized course work.

COMMUNITY PARTNERSHIPS

A publicly accessible compost bin is available for non-campus residents to place their organic waste. Compost is sold to the public at $25/yard or through work trade.

ONLINE RESOURCES

Website: Composting Facility
Website: Creative Inquiry Course
Website: Soldier Fly Digester

CONTACT

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FURMAN UNIVERSITY

Location:	Greenville, SC
Density:	Suburb
Enrollment Category:	1,000 - 4,999
Sector:	Private not-for-profit
Type of Organics Recovery:	On-site Bin-system On-site Compost Tea On-site In-Vessel On-site Vermiculture
Source(s):	Campus Farm Dining Services Leaf and Limb

Photo courtesy of Furman University

INSTITUTIONAL PARTNERS

- Dining Hall
- Facilities
- Faculty
- Students

FUNDING MECHANISMS

A portion of the funding for an in-vessel composter is through a state travel and education grant. Current funding for operations of the composting program is through internal operational budgets for farm management staff and student interns. The Duke Endowment has also been instrumental in funding farm programs and research.

OPERATIONAL MODEL

On-site in-vessel and bin systems are sourced from food waste from the dining hall, and leaf and limb waste. Finished compost is used at the Furman Farm and provided to the community.

STUDENT INVOLVEMENT

Students participate in the composting at Furman Farm through internships, volunteer hours, and academic course work. Students can bring food waste to the farm to contribute toward the community compost.

ACADEMIC PROGRAMMING

Faculty has incorporated composting and farming into curriculum in disciplines such as English, Business Sustainability, and Health Sciences.

COMMUNITY PARTNERSHIPS

The Furman Farm leads programming such as summer workshops and adult learning opportunities. Compost is currently offered to community for free.

ONLINE RESOURCES

Video: Composting at the Furman Farm
Video: Furman Organic Farm Information
Website: Furman Farm

CONTACT

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UNIVERSITY OF SOUTH CAROLINA (UofSC)

Location:	Columbia, SC
Density:	City
Enrollment Category:	20,000 and above
Sector:	Public
Type of Organics Recovery:	*Current* On-site Bin-System *Current* On-site Vermiculture *Future* On-site Institutional
Source(s):	Campus Garden

Source: Carolina Community Farm and Garden online gallery

INSTITUTIONAL PARTNERS

- Administration and Finance
- Dining Services
- Facilities Department
- Office of Sustainability
- Students

FUNDING MECHANISMS

Funding sources for institutionalized composting are currently being explored. Some initial studies and documentation include calculating the initial return on investment, operations plan, and obtaining bids from providers via state purchasing policies.

OPERATIONAL MODEL

Plans exist for on-site composting utilizing an anaerobic digester; the implementation date is set for late 2016.

STUDENT INVOLVEMENT

Currently, students participate in a Sustainable Carolina Leadership Program that is composed of undergraduate internships students may also participate in Eco-reps and programming at the Green Quad, where demonstration bins are managed by students. Once an organics waste recovery program is institutionalized, students may participate in a campus in institutionalized composting programming.

ACADEMIC PROGRAMMING

Coursework through service learning classes may include a focus on organics recovery

COMMUNITY PARTNERSHIPS

Sustainability awareness events are offered to the community during Food Week. Participants are encouraged to challenge food related practices, such as composting food scraps.

ONLINE RESOURCES

Facebook Page: Carolina Community Farm and Garden
Website: Food Week Sustainability Events
Website: Green Quad
Website: Office of Sustainability

CONTACT

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UNIVERSITY OF TENNESSEE - KNOXVILLE (UT)

Location:	Knoxville, TN
Density:	City
Enrollment Category:	20,000 and above
Sector:	Public
Type of Organics Recovery:	On-site Windrow Style
Source(s):	Animal Bedding Campus Farms Coffee Grounds Dining Services Leaf and Limb Manure

Photo courtesy of University of Tennessee - Knoxville

INSTITUTIONAL PARTNERS

- Dining Services
- Student Interns
- UT Organic Farms
- UT Recycling

FUNDING MECHANISMS

Funding sources for composting is through the operational and includes one full-time staff member who handles composting as part of their role. Dining service staff, and student interns also help. The Green Fee Program has also funded the purchase of equipment.

OPERATIONAL MODEL

On-site composting includes waste products such as food waste from dining halls, and wood chips from grounds. The finished compost is used on the UT Organic Farms as soil amendments and for erosion control on-site.

STUDENT INVOLVEMENT

Students may participate in composting operations through volunteer, internships, and course work opportunities.

ACADEMIC PROGRAMMING

Composting is currently a focus in the Institute of Agriculture, Organic Crop Production Program, where research is conducted and students complete coursework.

COMMUNITY PARTNERSHIPS

The on-site composting occurs fully on campus facilities.

ONLINE RESOURCES

Website: Campus Composting
Website: Student Green Fee Program
Website: Undergraduate Organic Production Concentration
Website: Undergraduate Plant Science Courses

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The 20 organics recovery profiles included in this Compendium reveal that organics recovery vary based on factors such as the size, location, funding mechanisms, and participation of faculty, staff, and students. Each institution's organic recovery program characteristics contribute to a typology and collection of common themes that will be used for the framework for the next stage of the toolkit development. The profiles showcase not only what programs exist, but also document success stories and challenges that can be addressed with future guidance. Institutions described the following areas of success and challenge:

Successes:

- Internal partnerships
- External partnerships
- Financial support of college/university
- Peer-learning from other post-secondary institutions
- Student involvement
- Demonstrated positive cost-benefit
- Establishing the necessary resources for organics recovery operations
- Allowing ample time for implementation
- Following the operational permitting process
- Identifying the ideal location
- Well-established staff responsibilities
- Catering the method to the particular college/university context
- Understanding cultural attitudes and demands
- Education and outreach programming

Challenges:

- Compost odor
- Contamination from non-compostable items
- Nuisance from attracted wildlife
- Aesthetic concerns
- Negative perception of compost due to sanitary issues
- Lack of governmental (federal and state) support
- Lack of funding mechanisms
- Lack of guidance for program planning and implementation
- Keeping collection bins clean
- Demands for manual labor
- Navigating the permitting process
- Incorporating composting into course curriculum
- Issues associated with methane production
- Limited land availability
- Surplus of compost
- Continuity of operations
- Dealing with turnover among student staff/volunteers
- Transportation costs
- Influencing a behavioral shift among college/university patrons
- Lack of waste hauler and/or commercial composting facility
- Distance of composting site from college/university
- Turnover among private waste management businesses
- Incurred greenhouse gas emissions due to mechanization of composting process
- Logistical planning and implementation
- Bureaucratic concerns
- Overcoming negative cost benefit

The profiles are meant to showcase current organics recovery efforts and encourage peer-to-peer learning opportunities among college/university organics recovery program representatives. While only 20 schools with in EPA Region 4 with existing organics recovery programming are profiled, information from additional colleges/ universities that are interested in sharing their composting efforts can be incorporated. This Compendium should not be seen as a static document, but rather one that can evolve as more programs are included.

With the completion of this first iteration of the Compendium, the common terms, categories, and descriptions will continue to be refined and will serve as a foundation for the subsequent Organics Recovery Toolkit for Colleges and Universities. Using the iconology and other formats introduced in this Compendium (see image and categories below), a web-based toolkit will be crafted that is easily navigable, comprehensive, and publicly-available to anyone interested in the specifics of composting and/or planning and implementing an organics recovery program.

Appendix A: Compendium Summary Table

BASIC INFORMATION							
NAME	**LOCATION**	**STATE**	**DENSITY**	**ENROLLMENT CATEGORY**	**SECTOR**	**CONTACT**	**TYPE OF ORGANICS RECOVERY**
University of Alabama	Tuscaloosa	AL	City	20,000 and above	Public	A.J. Delfaco	Off-site windrow style
University of Florida	Gainesville	FL	City	20,000 and above	Public	Liz Storn	Off site commercial facility On-site windrow style
Agnes Scott College	Decatur	GA	Suburb	Under 1,000	Private not-for-profit	Susan Kidd	Off-site commercial facility On-site bin-system
Georgia College & State University	Milledgeville	GA	Town	5,000-9,999	Public	Lori Strawder	On-site aerated static piles
Georgia Institute of Technology	Atlanta	GA	City	20,000 and above	Public	Grant Grimes	Off-site commercial facility On-site bio-digester
Georgia Southern University	Statesboro	GA	Town	20,000 and above	Public	Lissa Leege	On-site bin-system
University of Georgia	Athens	GA	City	20,000 and above	Public	Brett Ganas	On-site windrow style
Berea College	Berea	KY	Town	1,000-4,999	Private not-for-profit	Cait McClanahan	On-site bin-system
University of Kentucky	Lexington	KY	City	20,000 and above	Public	Steve Higgins Shane Tedder	On-site windrow style
University of Louisville	Louisville	KY	City	20,000 and above	Public	Brian Barnes Justin Mog	Off-site commercial facility On-site bin-system On-site vermiculture
Western Kentucky University	Bowling Green	KY	City	20,000 and above	Public	Christian Ryan	Off-site windrow style
University of Mississippi	University	MS	Town	10,000-19,000	Public	Lindsey Abernathy	On-site windrow style
Appalachian State University	Boone	NC	Town	10,000-19,000	Public	Jen Maxwell	On-site forced aeration
Guilford College	Greensboro	NC	City	1,000-4,999	Private not-for-profit	David Petree	On-site compost tea On-site in-vessel On-site vermiculture On-site windrow style
North Carolina State University	Raleigh	NC	City	20,000 and above	Public	Analis Fulghum Rhonda Sherman	Off-site commercial facility
University of North Carolina - Chapel Hill	Chapel Hill	NC	City	20,000 and above	Public	Natalia Posthill	Off-site windrow style On-site bin-system
Clemson University	Clemson	SC	Suburb	20,000 and above	Public	Dave VanDeventer	On-site in-vessel On-site larvae/black soldier flies On-site static aerated piles On-site vermiculture On-site windrow style
Furman University	Greenville	SC	Suburb	1,000-4,999	Private not-for-profit	Bruce Adams Phil Lewis	On-site bin-system On-site compost tea On-site in-vessel On-site vermiculture
University of South Carolina	Columbia	SC	City	20,000 and above	Public	Namita Koppa	On-site bin-system On-site vermiculture
University of Tennessee - Knoxville	Knoxville	TN	City	20,000 and above	Public	Jay Price	On-site windrow style

Appendix A: Compendium Summary Table

BASIC INFORMATION		ORGANICS RECOVERY SOURCE (current)						
NAME	TYPE OF ORGANICS RECOVERY	CAMPUS GARDENS/ FARMS	DINING SERVICES	LEAF AND LIMB	OFFICES	RESIDENCE HALLS	SPECIAL EVENTS	OFF-CAMPUS
University of Alabama	Off-site windrow style		x	x				
University of Florida	Off site commercial facility		x	x				x
Agnes Scott College	Off-site commercial facility	x	x					
Georgia College & State University	On-site aerated static piles			x				
Georgia Institute of Technology	Off-site commercial facility		x	x				
Georgia Southern University	On-site bin-system		x	x				
University of Georgia	On-site windrow style		x	x	x			
Berea College	On-site bin-system	x	x	x		x		
University of Kentucky	On-site windrow style	x		x				x
University of Louisville	Off-site commercial facility On-site bin-system On-site vermiculture		x	x			x	x
Western Kentucky University	Off-site windrow style		x	x				
University of Mississippi	On-site windrow style		x	x				
Appalachian State University	On-site forced aeration		x				x	x
Guilford College	On-site compost tea On-site in-vessel On-site vermiculture On-site windrow style	x	x	x	x	x		
North Carolina State University	Off-site commercial facility		x	x	x	x	x	
University of North Carolina - Chapel Hill	Off-site windrow style On-site bin-system	x	x	x		x	x	
Clemson University	On-site in-vessel On-site larvae/black soldier flies On-site static aerated piles On-site vermiculture On-site windrow style	x	x	x	x	x		
Furman University	On-site bin-system On-site compost tea On-site in-vessel On-site vermiculture	x	x	x				
University of South Carolina	On-site bin-system On-site vermiculture	x						
University of Tennessee - Knoxville	On-site windrow style	x	x	x				x

Appendix A: Compendium Summary Table

	INSTITUTIONAL PARTNERS (current)									
NAME	ADMIN-ISTRATION	COMMITTEE/ COUNCIL	DINING SERVICES	EXTERNAL SOURCES	FACILITIES MANAGE-MENT	FACULTY/ STAFF/ OFFICES	GARDEN/ FARM/ ARBOR-ETUM	RESIDENCE HALLS	STUDENTS	SUSTAIN-ABILITY PROGRAM
University of Alabama			x		x		x			
University of Florida			x		x	x	x		x	x
Agnes Scott College			x							x
Georgia College & State University		x	x		x	x			x	x
Georgia Institute of Technology			x		x				x	x
Georgia Southern University			x		x				x	x
University of Georgia			x		x	x	x		x	x
Berea College	x		x	x	x		x	x	x	x
University of Kentucky	x					x	x		x	x
University of Louisville		x	x	x	x	x		x	x	x
Western Kentucky University			x	x	x		x		x	x
University of Mississippi		x	x	x		x	x		x	x
Appalachian State University	x		x		x		x		x	x
Guilford College			x		x	x	x	x	x	x
North Carolina State University			x	x	x	x	x	x	x	
University of North Carolina - Chapel Hill		x	x		x	x	x	x	x	
Clemson University			x		x	x	x	x	x	
Furman University			x		x	x	x		x	
University of South Carolina	x		x		x		x		x	x
University of Tennessee - Knoxville			x		x		x		x	

Appendix A: Compendium Summary Table

	FUNDING MECHANISMS				STUDENT INVOLVEMENT					
NAME	DONATED TIME/ EQUIPMENT/ WORK	INCOMING FUNDING	NO ADDIT-IONAL FUNDING	OPERAT-IONAL BUDGET	COURSE - WORK	INTERNSHIP	OUTREACH/ AWARE-NESS BUILD-ING	PLANNING OF PRO-GRAM	VOLUNTEER	WORK STUDY
University of Alabama	x			x						
University of Florida				x				x	x	
Agnes Scott College			x						x	
Georgia College & State University				x		x	x	x		
Georgia Institute of Technology				x			x			
Georgia Southern University				x				x	x	
University of Georgia	x	x		x	x	x			x	
Berea College	x	x		x		x	x		x	x
University of Kentucky				x	x		x			
University of Louisville	x	x		x	x	x			x	
Western Kentucky University				x					x	
University of Mississippi				x		x	x	x	x	
Appalachian State University				x		x		x		
Guilford College				x	x		x			x
North Carolina State University		x		x	x	x	x		x	
University of North Carolina - Chapel Hill	x			x	x	x	x		x	
Clemson University	x	x		x	x	x			x	x
Furman University		x		x	x	x			x	
University of South Carolina			x			x			x	
University of Tennessee - Knoxville				x	x	x			x	

Appendix A: Compendium Summary Table

	ACADEMIC PROGRAMMING			COMMUNITY PARTNERSHIPS			
NAME	**OUTPUTS: RESOURCE/ PUBLICATION**	**RESEARCH/ COURSE CURRICULUM**	**SERVICE LEARNING**	**COMMUNITY EDUCATION**	**COMPOST FOR DONATION**	**COMPOST FOR PURCHASE**	**EXTERNAL NETWORKING**
University of Alabama					x		
University of Florida		x					x
Agnes Scott College							x
Georgia College & State University		x					
Georgia Institute of Technology						x	
Georgia Southern University		x	x				
University of Georgia		x			x		x
Berea College		x	x	x			x
University of Kentucky	x			x			x
University of Louisville		x	x	x	x		x
Western Kentucky University							
University of Mississippi	x	x			x		
Appalachian State University		x	x				
Guilford College		x					
North Carolina State University	x	x	x	x			x
University of North Carolina - Chapel Hill		x			x		
Clemson University		x		x		x	
Furman University		x		x	x		
University of South Carolina		x	x	x			
University of Tennessee - Knoxville		x					

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