

Introducing Composting into UCLA On-Campus Housing

A Division of The Green Living Project

A project of the Education for Sustainable Living Program at UCLA

And the UCLA Institute of the Environment

Green Living Project Coordinator: Ryan Mullen

Waste/Compost Team Leader: Spencer Hill

Team Members: Jagrup Sidhu, Michael Winston, Rachel Kellman,

Rachel Stallman, and Sandra Harpster

June 12, 2009



Abstract

The compost/waste team, a component of the Green Living Project, has proposed a composting program throughout all on-campus housing buildings and supported that proposal with conclusive evidence. Between January and June of 2009, the team conducted three “waste audits” of different floors in on-campus residences: two in a residence hall and one in a residential plaza. These audits consisted of the team sealing off the floor trash chute, installing their own compost, recycling, and waste bins, performing educational outreach, and then taking out the trash twice daily. The team then sorted, categorized, and weighed each trash load. The team also examined a number of “best practices” that UCLA could implement, including electrolyzed water as a cleaning solution and purchasing choices in the residential area’s student store.

Initial results proved promising: students in these studies voluntarily diverted over 50% of their total waste to compost, with another 30% to recycling. After the group’s resorting efforts, compost waste increased another 10% and recycling also increased, while trash decreased by nearly half. The team also found that educational outreach was necessary to encourage students to divert waste, but that on the whole, students seemed enthusiastic about a housing-wide compost program. Should such a program be implemented in all on-campus housing buildings, the school could divert over 400,000 pounds of waste from landfills each year, even without achieving ideal results. Therefore, the compost/waste team recommends that UCLA pilot a building-wide composting program in at least one residential building in the 2009-2010 school year with the existing trash chute converted to a compost-only chute, that this compost program be phased into all additional on-campus housing by 2012, and that all future on-campus housing buildings be constructed with one chute for compost and one for recycling.

Acknowledgements

We wish to thank the following individuals and organizations for their support of our research. Their help was instrumental to the success of our project.

- Rob Kadota, Assistant Director, Office of Residential Life
- Robert Gilbert, Sustainability Coordinator, On Campus Housing & Hospitality Services
- Cully Nordby & Carl Maida, Academic Advisors – ESLP Action Research Teams,
UCLA Institute of the Environment
- Jeff Hall, Manager, Maintenance Division – On Campus Housing & Hospitality Services
- Sarah Quinn, Residence Hall Manager, Sproul Hall
- TiRease Holmes, Resident Director, Sproul Hall
- Lisette Molina & Alex Tran, Resident Assistants, Sproul Hall 2 North
- Xochitl Cervantes, Resident Assistant, Sproul Hall 2 South
- Carisa Narvaez, Rieber Area Manager
- Kirk White, Resident Director, Rieber Terrace
- Gerardo Guzman, Custodial Manager, Rieber Terrace
- David Larson & Andrea Chung, Resident Assistants, Rieber Terrace 3
- Jan Griwach, ASUCLA Director of Computers and Supplies
- Sproul 2N, 2S, and RT3 residents
- Sproul Hall & Rieber Terrace Housekeeping Staff
- UCLA Housing Administration
- UCLA Housing & Hospitality Services
- UCLA Office of Residential Life
- UCLA Facilities Management

Table of Contents

Overview and objectives	5
Significance of study	6
Initial conditions	6
Research methodology	
Location.....	8
Procedure.....	8
Outreach and education.....	9
Data	
Sproul 2 North	9
Sproul 2 South	11
Rieber Terrace 3	14
Key findings	16
Waste diversion at other colleges	18
Other research endeavors	20
Recommendations	21
References	24
Appendices	25

Overview and Objectives

Our research focused on the implementation of collecting compostable waste within UCLA on-campus housing buildings. To this end, we piloted three in-building composting programs dubbed “waste audits” in which we collected, weighed, categorized, and itemized all waste produced by one floor of a building in one week’s time. Using the data obtained through these audits, we sought to answer several important questions related to implementing a composting program of this scale and variety. What range of diversion rates could we expect by introducing composting? What kind of outreach and education strategies work best in motivating residents to sort their waste into compost, recycling, and trash? What sort of logistical challenges would introducing a new category of waste create? What would the resident reaction to the program be? As this report details, the answers to these questions indicate that an institutionalized compost collection system within UCLA on-campus housing residential buildings is highly feasible and would yield substantial increases to the amount of waste diverted on the UCLA campus.

The Waste/Compost research team is one of three teams that comprise the Green Living Project, a research project seeking to increase student sustainability in UCLA on-campus housing through improved resource usage; the two other teams focused on student water and electricity usage, respectively. Throughout the project, all three teams worked closely with our two campus stakeholders, Rob Kadota, Assistant Director, UCLA Office of Residential Life, and Robert Gilbert, Sustainability Coordinator, UCLA Housing & Hospitality Services.

Please refer to Appendix B for diagrams of the various bin types used during the project, as they are frequently referred to throughout.

Significance of Study

Composting refers to the process of collecting organic matter – essentially anything that originally came from an animal or plant – and allowing it to break down into humus, essentially a high-quality soil or soil-additive¹, which can then be put to a variety of uses. Compost used in agriculture decreases the need for water, fertilizers and pesticides; it can also help restore contaminated and/or compacted soils. Compost is also used to filter solids, oil, grease, and heavy metals from storm-water runoff and has been shown to extract and destroy 99.6% of industrial volatile organic chemicals in contaminated air. It is a proven low-cost method of cleaning contaminated soil and is a relatively inexpensive alternative to standard landfill cover. Composting also extends municipal landfill life by diverting organic materials from landfills.²

Diverting organic waste through composting is no small accomplishment, given the environmental detriments associated with landfills. Landfill gas released into the atmosphere accounts for almost 23% of all methane, a potent greenhouse gas and contributor to climate change, released in the United States. It also contains volatile organic compounds that contribute to ozone formation and hazardous air pollutants that negatively affect human health.³

Initial Conditions

Normally, students in residence halls dispose of all trash in a building trash chute to which each floor has access. Recycling is “opt-in” – residents can choose to sort out recycling and take it to a large blue recycling bin provided on each floor; however, there are no incentives nor disincentives to choosing to recycle or not. Either two or three students share each room;

¹ This may sound incorrect to anybody who composts at home. All organic matter, including meat, paper products, and dairy, will biodegrade into humus. However, these and other items are generally excluded from at-home compost bins because of issues with odor and pests. Compost collected at UCLA is trucked to an industrial-scale composting facility, a setting in which odor and pest issues are negated and almost all organic matter can be accepted.

² <http://www.epa.gov/wastes/conservation/rrr/composting/basic.htm>

³ <http://www.epa.gov/landfill/faq-3.htm>

each room has one small beige trash can and a slightly smaller blue recycle bin. In addition to the trash chute, there are also medium-sized, semi-circular beige trash bins in each bathroom and floor lounge; housekeeping staff empties these communal bins daily. Compost is normally not collected within any on-campus housing residential building.

In recent years, various composting measures have been implemented on “The Hill,” the largely residential portion of UCLA’s campus that incorporates all on-campus housing buildings. Beginning with the 2007-2008 academic year, De Neve dining hall, the largest of four dining halls on the Hill, began composting food waste left by students. This compost collection is entirely “back-end,” that is, students do not actively participate in the actual compost collection process at all nor are they necessarily made aware of the composting. This effort has since expanded to include the other three dining halls as well and to Rendezvous, a quick-service style eatery located on the Hill. In April 2009, Rendezvous also removed the trash receptacles in its main customer entranceways in favor of compost and recycling receptacles. This was the first composting effort on the Hill in which compost receptacles were made openly available to students – all prior efforts were operated entirely by staff. Additionally, all four quick-service eateries located on the Hill have switched to almost entirely compostable or recyclable items, including compostable to-go containers, compostable “spudware” utensils, and recyclable soup and salad containers. Chip bags, offered at the BruinCafe quick-service eatery, are one of the only items offered that are not currently divertible through either composting or recycling. These diversion-oriented purchasing efforts would come to be a large contributor to the generally high diversion rates obtained during our audits, as we found that food and other waste from quick-service eateries constitutes a large portion of overall waste.

Research Methodology

Location

Our waste audits took place in Sproul Hall and Rieber Terrace, two residential buildings located on the Hill. Sproul Hall is a traditional “residence hall” style building, with one communal bathroom per gender, per floor⁴. A trash chute is located in one of two main hallways in each floor, and a large recycling bin is located in the floor lounge. Rieber Terrace is a “plaza” style building, in which each room shares a private bathroom with one adjacent room. In Rieber Terrace, both the trash chute and the large recycling bin on each floor are located in a designated floor trash room.

Procedure

We conducted a total of three waste audits – the first on the 2 North floor of Sproul Hall (Sproul 2N), the second on Sproul 2 South (Sproul 2S), and the third on the third floor of Rieber Terrace (RT3). Each audit lasted exactly one week. For that week, we sealed shut the trash chute that students normally use to dispose of their trash and installed bins on the floor for compost and trash. The large recycling bin normally found on the floor remained unaltered.

A pair of team members emptied and weighed the contents of the bins twice daily, once around 2:00 p.m. and again around 10:00 p.m. Any bins less than 1/3 full were not emptied and were left for the next collection. In the second and third audits – Sproul 2S and RT3, respectively – our team members also re-weighed each bin after completing a “re-sort” for all categories, noting and removing items incorrectly placed in one category and replacing them to their proper bin (example: a plastic water bottle incorrectly placed in compost would be re-sorted into

⁴ In Sproul Hall, each physical floor of the building is separated into two distinct residential community units, dubbed “North” and “South.” Each has its own trash chute, bathrooms, lounge, and resident assistants. When discussing Sproul Hall, the term “floor” in this report refers to this “North” or “South” unit of organization. In Rieber Terrace, however, there are no divisions within individual floors, and so communities are naturally organized by physical floor.

recycling). This gave us an understanding both of how well residents understood what belongs in each category and of which items were most frequently placed incorrectly. After recording all data, we disposed of all waste in appropriate dumpsters located in a close proximity to the buildings.

Outreach & Education

During the week leading up to each audit, we posted signs in various locations around the floor to notify residents about the program. Some were meant to be simply humorous and eye-catching; others were informative, detailing the dates of our program, who to contact with questions, and specifics about what can and cannot be composted. All bins had signs on or above them detailing what should and shouldn't be put in. Additional outreach measures unique to specific audits are detailed below in their appropriate sections.

Administrative Approvals

In order to conduct our waste audits, it was necessary to receive administrative approval from all relevant campus offices and departments. We outline these procedures here for the benefit of any future student research projects that relate to waste diversion in on-campus housing. The overall research idea of exploring composting in on-campus housing required the explicit approval of the Office of Residential Life. In both Sproul Hall and Rieber Terrace, we were granted the approval to conduct our audits by the building and area managers, the building resident director, and the resident assistants of the floor we were working with. In order to ensure that our audits were accounting for all waste deposited on the floor in a week, we had to arrange with the housekeeping staff that they not take out any waste on the floor for that week.

Data

Sproul 2N

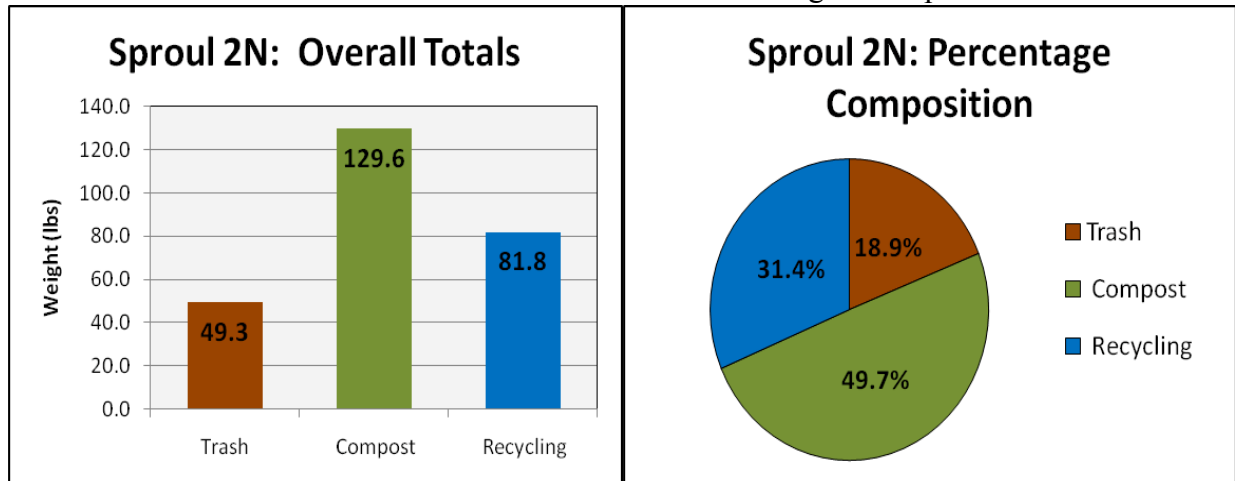
Our first pilot project ran from 10:00 p.m. on Sunday, March 1, 2009, through 8 p.m. on Sunday, March 8, 2009, in the 2 North floor of Sproul Hall. Sproul 2N houses 84 total residents and is one of four “themed” communities created by the Office of Residential Life (ORL); 2N’s theme is sustainability. However, the data indicate no significant difference in 2N’s waste habits due to their environmentally conscious floor theme.

Three days before beginning our program, Lisette Molina, the resident assistant for Sproul 2N, posted informational signs about the program in the floor lounge, by the elevator and in some of the restroom stalls and sent out an email to all residents with the same pertinent information. In the floor lounge, our team placed two medium-sized semi-circular bin and one small bin for compost, and one medium-sized and one small bin for trash, in addition to the large recycling bin already in place. There was a medium-sized compost bin in the laundry room, and two of these in each of the two restrooms; we placed one small trash bin in each restroom as well.

Waste collected from Sproul 2N was weighed on one of two scales. Any bags weighing over ten pounds went to a large industrial-grade scale located in the Sproul Hall basement, precise only to the half pound. All bags ten pounds or lighter we weighed on a small mailing scale, precise to the 0.01 pound. This scale was located in the UCLA Maintenance Office just outside the Sproul basement. Due to issues with getting access to the Maintenance Office, all waste was weighed on the low-precision scale for the first two days of the audit. After recording all the weights, we took the recyclables to a recycling dumpster located on the loading dock behind the Sproul basement; compost and trash were taken to food waste and trash dumpsters, respectively, located on the loading dock of Tom Bradley International Hall behind De Neve Plaza on Charles E. Young Drive West. Three days following the conclusion of the program,

Lisette emailed an online exit-survey to all of the 2N residents, to which 21 responded, asking for their reaction to specific aspects of the audit and to the program as a whole.

Figure 1: Sproul 2N Audit Results



Over the course of seven days, the residents of Sproul 2N disposed of a grand total of 251.9 pounds of waste (Figure 1). This consisted of 81.4 pounds of recycling, 121.6 pounds of compost, and 48.8 pounds of trash. As percentages of the total weight, these equate to 31.4%, 49.7%, and 18.9% respectively for recycling, compost, and trash. In other words, less than one-fifth of all waste produced on the floor was landfill bound – the remaining 81.1% (211.4 lbs) diverted through either compost or recycling. This relatively high rate is augmented by the results of the resident exit-survey, which were overwhelmingly positive. Residents indicated that the program was overall a very positive experience and were appreciative of our environmentally friendly efforts; residents gave the program a mean overall grade of 9.0 on a scale from 1 to 10. However, respondents also noted that the lounge bin setup, with multiple bins each for trash and compost, was confusing and should be consolidated into a one bin per category system. Additionally, they expressed a desire for better education of the residents prior to the audits and improved signage above the bins focused primarily on visual aids and less on text. Furthermore,

we noticed a considerable amount of waste being misplaced – put into the incorrect bin – which led us to implement a “re-sorting” procedure in the following two audits.

Sproul 2S

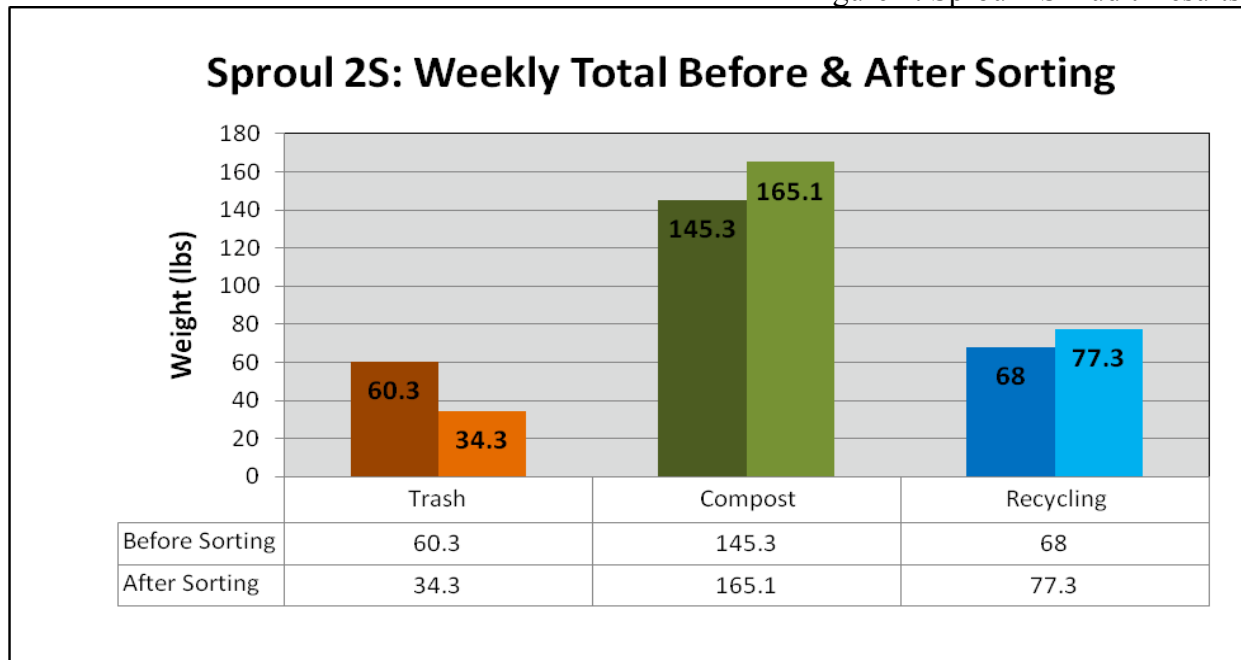
Our second waste audit took place on the 2 South floor of Sproul Hall from 2:00 p.m. May 3, 2009, to 2:00 p.m. May 10, 2009. Like 2N, Sproul 2S houses 84 residents and is a specially designated themed communities on the Hill; their theme is “Chicana/o & Latina/o Studies.” Along with signage re-used from the Sproul 2N audit, our outreach efforts included flyers posted inside of all bathroom stalls on the floor a week in advance of the program, inviting residents to a Facebook event outlining the details of the program, and an announcement at a widely attended (roughly 30 residents) floor meeting a week before the program. We found the stall flyers to be particularly effective, most likely because simply all residents have to use them with some frequency.

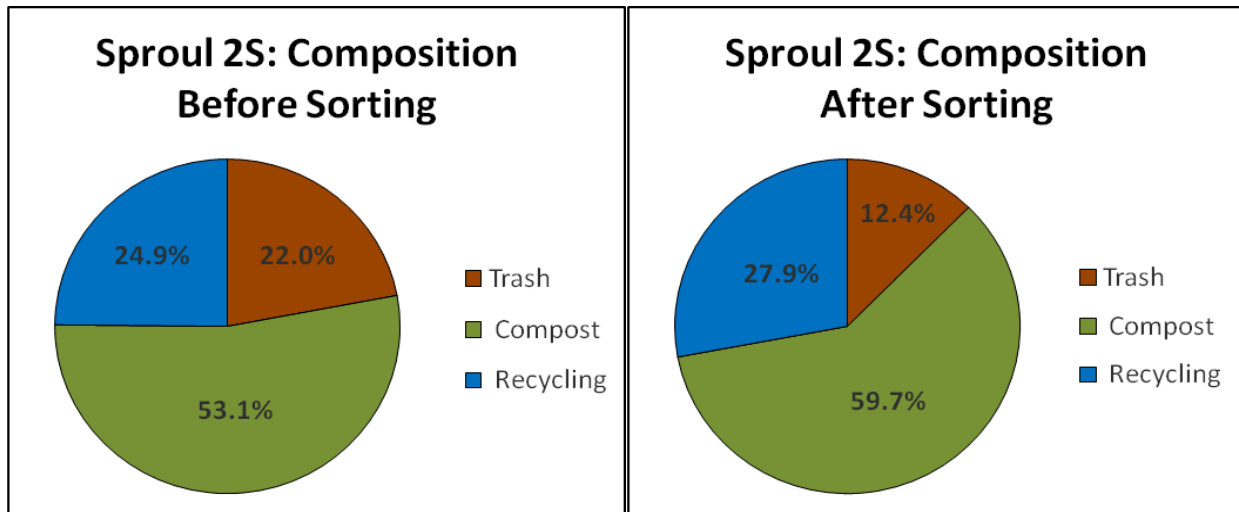
We placed two large bins, one for compost and one for trash, adjacent to the standard large recycling bin in the floor lounge. Signs above each bin used actual physical items to visually outline what should be thrown in. For example, the recycling bin sign included newspapers, plastic bottles, computer paper, and plastic drink lids either taped or stapled on. Students could thus use the signs to match the item they were disposing to the correct bin. Both bathrooms were outfitted with one medium-sized semi-circular bin for compost and one small black “side-saddle” bin for trash. The laundry room semi-circular trash bin was designated as compost. Upon beginning the audit, we also distributed door-to-door small “side-saddle” bins that hook onto their existing recycling bins, instructing them to use the side-saddle for trash and use their normal trash bin for compost during the program. These side-saddle bins were

introduced to provide a means for residents to sort out compost in their rooms, in hopes that this would lead to less incorrectly placed items in the communal floor bins.

For this audit and the Rieber Terrace 3 audit, all weights were recorded on-site using a small digital hanging scale, precise to the 0.1 pound. New to this audit was the “re-sorting” procedure. After weighing the contents of the bins as they had been originally placed by the residents, we then looked through all of the bags for incorrectly placed items, documented them, and placed each item in the appropriate bag, reweighing each category after all items were in their correct bag. This allowed us to determine how well residents were educated and willing to separate out their waste correctly, note which items were most frequently misplaced, and determine target or ideal diversion rates, the rates generated if every resident sorted out their waste with 100% accuracy. All waste was ultimately disposed of in the same dumpsters used for the Sproul 2N audit.

Figure 2: Sproul 2S Audit Results





Prior to our re-sorting, the residents of Sproul 2S disposed of a total of 273.6 pounds of waste during the week, of which 60.3 pounds (22.0%) was trash, 145.3 pounds (53.1%) was compost, and 68.0 pounds (24.9%) was recycling (Figure 2). These figures are very similar to those produced by Sproul 2N, which indicates little to no meaningful difference between the floors' residents in terms of their waste habits. However, re-sorting the waste saw significant increases in landfill diversion. After re-sorting, only 34.3 pounds (12.4%) of the waste collected ended up as trash, while 165.1 pounds (59.7%) was compost and 77.3 pounds (27.9%) was recycling. In other words, 87.4% of all waste disposed of in Sproul 2S could be diverted from landfills, with nearly 60% of the total waste generated being composted. Under normal conditions without composting, this majority of the waste stream, roughly 165 pounds of compost, would be bound for landfills.

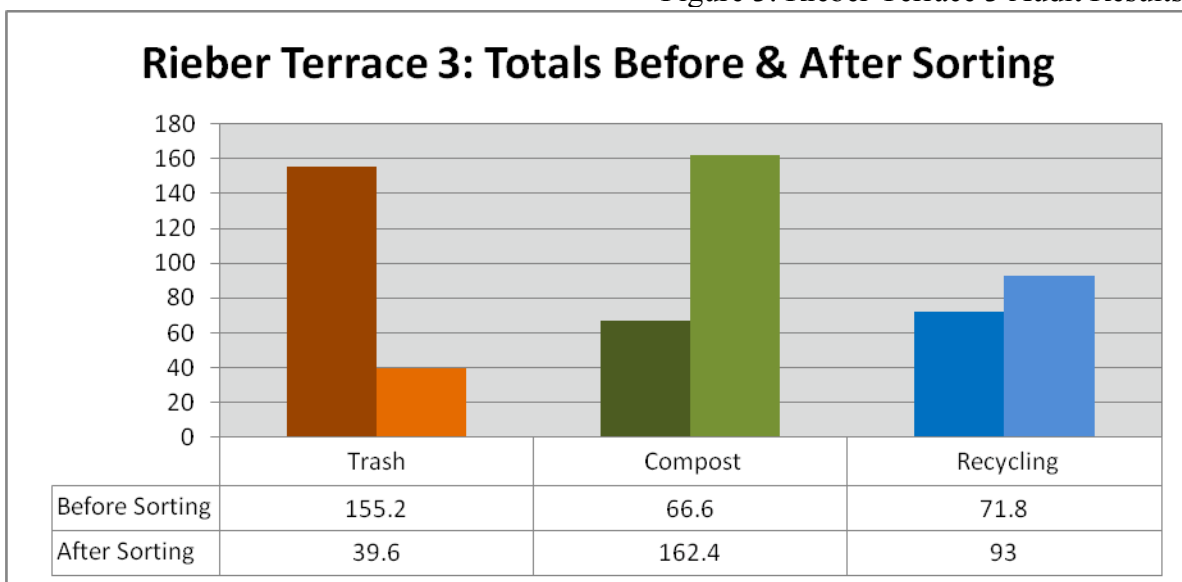
Rieber Terrace 3

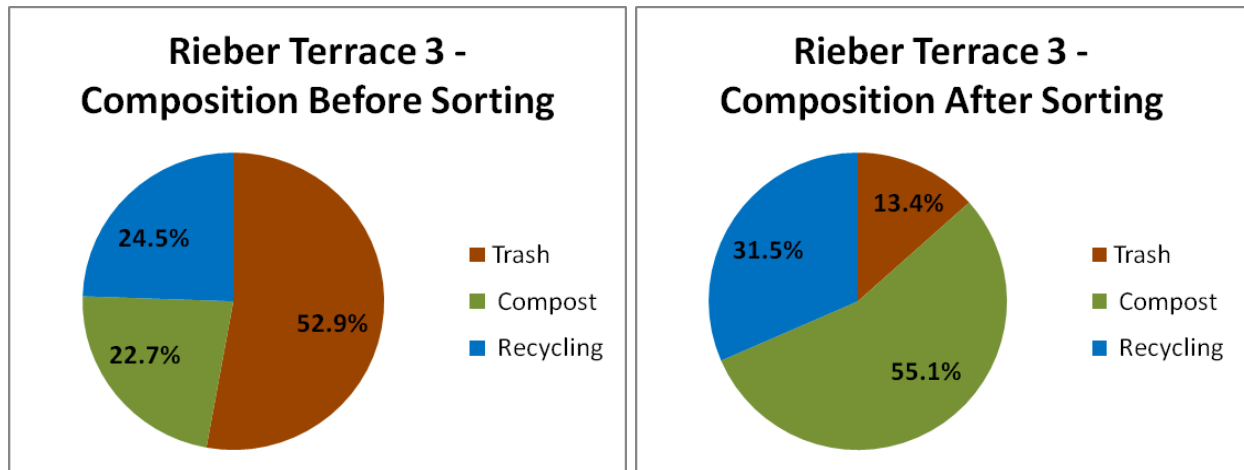
The final waste audit ran from 3:00 p.m. on Monday, May 18, 2009 through 3:00 p.m. Monday, May 15, 2009, in the 3rd floor of the Rieber Terrace residential plaza building. RT3 houses 100 total residents (including two members of our research team) and, unlike Sproul 2N or Sproul 2S, is not a specially designated themed community. As with the prior audits, various

signs were posted in advance of the program in floor common areas. The side-saddle bins were delivered three days in advance of the beginning audit rather than on the day of, with the intention that residents begin sorting out their compost in advance of the project in order to get used to it. However, delivering the side-saddles and explaining the program to residents was not very successful, as very few rooms opened their doors when we came around on multiple occasions. We also did not announce the program at a floor meeting, as attendance was generally less than five people. Also, because Rieber Terrace doesn't have communal bathrooms, we were unable to post flyers inside the bathroom stalls as we had in the Sproul 2S audit. In a certain sense, this audit acts as a control group, that is, a test of how well introducing composting goes when outreach and education efforts essentially fail. As is documented below, this lack of education of residents is definitely reflected in our data.

We placed one large compost bin and one large trash bin in the floor trash room alongside the standard large recycling bin. Signs similar to those used in the Sproul 2S audit with physical examples of items attached were put up above each bin. One semi-circular trash bin in each of two floor lounges remained unaltered for trash.

Figure 3: Rieber Terrace 3 Audit Results



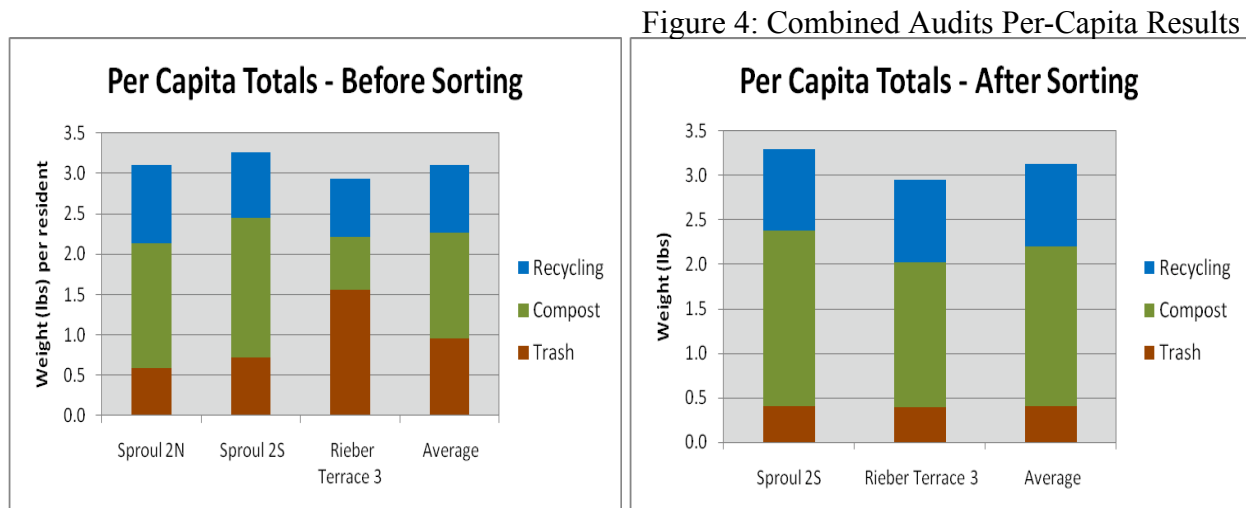


During the week, the residents of RT3 disposed of 293.6 total pounds of waste; of this, 155.2 pounds (52.9%) was placed in trash, 66.6 pounds (22.7%) compost, and 71.8 pounds (24.5%) in recycling. Trash, which constituted roughly 20% of the prior two audits, more than doubled in this audit to over 52%, compensated mostly by a substantial decrease in composting. Despite these much lower initial diversion rates, our re-sorting data indicates that the potential diversion rates remain as high in Rieber Terrace as they are in Sproul. After re-sorting only 13.4% of waste collected was trash (39.5% decrease), 55.1 % was compost (32.4% increase) and 31.5% was recycling (7.0% increase). This large difference between ideal and realized diversion rates, particularly in comparison to the realized diversion rates of Sproul 2N and Sproul 2S, indicate that proper outreach and education is vital to the success of an in-building compost program.

Key Findings

Overall, the data gathered from the three waste audits is extremely encouraging for the potential success of an institutionalized compost program on the Hill. They showed that, when properly informed, students are willing and capable of sorting out their waste into three categories, that the potential diversion rates with composting are extremely high, and that

students generally are in favor of waste diversion and composting efforts within their residences, even when it slightly complicates their normal waste disposal habits.



Based on the combined data of all three audits, the mean total amount of waste disposed of per person per week was 3.1 pounds, consisting of 1.0 pound (32.0%) of trash, 1.3 pounds (41.2%) of compost, and 0.8 pounds (26.8%) of recycling. This yields an overall landfill diversion rate of 68.0% without re-sorting; this is a relatively high rate even with the somewhat skewed results of Rieber Terrace 3 included. With re-sorting⁵, the diversion rate rises dramatically, with 0.4 pounds (12.9%) of trash, 1.8 pounds (57.3%) of compost, and 0.9 pounds (29.8%) of recycling, for an impressive mean overall potential diversion rate of 87.1%. Some of the most frequently misplaced items over all three audits were chip bags, compostable food containers from on-campus quick-service restaurants, plastic bags, computer paper, paper-based drink cups, and plastic drink lids and straws.

These mean values can be used to project the amount of additional waste that would be diverted through implementing composting collection at various scales on the Hill. For example, using the mean realized per capita composting rate of 1.3 pounds, a fully-comprehensive, Hill-

⁵ Mean re-sort data includes Sproul 2S and Rieber Terrace 3 only, as waste was not re-sorted in Sproul 2N.

wide composting program would divert 407,137 pounds from landfills per school year, given 34 weeks in each school year and a total of 9,398 undergraduate students living in on-campus housing. Combining this with the 258,445 pounds that would be diverted through recycling yields a total diversion of 665,576 pounds per school year through in-residence composting. Importantly, this rather high figure is based on our realized (before re-sorting) diversion rates; composting at this scale at the ideal diversion rates would lead to 843,248 pounds total diverted per school year – 556,609 pounds of compost and 286,639 pounds of recycling – an overall increase of 177,672 pounds as compared to the projections using the lower, realized diversion rates.

How can the realized diversion rate be increased to approach the ideal rate of 87.1%? Though we are unable to quantify the effectiveness of any of our outreach and education efforts, the data strongly suggests that adequate outreach and education is vital. Residents who do not know what can go in each bin or who are uninformed about the program will simply put all of their waste into trash by default. Residents should be informed of the program well in advance and be given an explanation of what will be expected of them, what difference composting makes, and why their participation makes a difference. Additionally, residents of Sproul 2N indicated that signage above the bins should be eye-catching, with little text and as many pictures and/or physical items included as possible.

Waste Diversion at Other Colleges

The data obtained from these audits indicates that institutionalized composting in UCLA on-campus housing is highly feasible. But additionally, there are numerous model campuses across the nation that have already successfully implemented aggressive waste diversion and reduction strategies. According to our research, at least fifteen colleges in the United States,

including UC Davis, UC Berkeley, Dartmouth, Middlebury, and North Carolina State, have already adopted composting or other food waste disposals programs on varying scales.

Middlebury diverts over 20% of its waste stream annually through composting, which has saved approximately \$200,000 in avoided landfill disposal costs since beginning its compost initiative in 1993⁶. Bard and Grinnell colleges both have dormitory composting programs⁷.

One particularly popular program is called Recyclemania. The program requires colleges to report their recycling data, and there are prizes for various categories, such as least trash generated and highest percentage of waste diverted from landfill. Six University of California campuses – Davis, Irvine, Merced, San Diego, Santa Barbara, and San Francisco – participated in the competition in 2009 along with over 500 other colleges and universities.⁸

Much can be learned from student efforts at the University of Texas – Austin (UT). There, students have created an extensive guide for methods of implementing recycling programs in dormitories at any college, including practical action steps and explanations such as “How to Educate Students about Recycling.” Based primarily on student empowerment, their system uses students as “EcoReps” and “Conservation Leaders” – sustainable student role models – who spread the word about living sustainably in the residence halls. There are also a variety of different positions residents can take on with varying time commitments, allowing them to get as many busy students involved as possible. These student leaders are involved in student recycling committees within each residence hall, and their primary objective is to educate the other students – ordinary students are empowered to design signage explaining the importance of recycling, what is and is not recyclable, tips to live “green,” and opportunities for

⁶ <http://www.middlebury.edu/administration/enviro/initiatives/food/composting.htm>

⁷ http://inside.bard.edu/community/projects/dorm_compost/index.html

http://www.grinnellwiki.com/images/d/d4/Grinnell_College_Dorm_Compost_Guide.pdf

⁸ <http://www.recyclemania.org>

other students to get involved. UT also utilizes resident assistants and social networking sites such as Facebook to spread awareness about sustainability. UT also recommends “Recycling Monitoring”, a practice somewhat similar in method to our waste audits. They do regular audits of the contamination levels of the recycling and trash bins and post this information on flyers around the hall. UT posts a great deal of important and interesting recycling facts on their website, which they distribute to students in the dorms as part of the education program. UT’s dorm recycling guide also suggests surveying students on what they know about what is recyclable in the dorms and how they go about recycling it, as well as the impact they think that recycling has on a global level. UT indicates that putting students’ responses alongside the real facts can make for a great flyer later on.⁹

Finally, UC Santa Cruz runs a student-supported program called “College Eight Waste Reduction,” which educates students about reducing waste and aids in the recycling of ink cartridges, hazardous wastes, electronics, light bulbs, glasses, metals, plastics and paper. College Eight conducts a weekly pick-up of compostable scraps from student apartments and a local cafe and collects discarded college mail for recycling. The program also leads students on “recycling tours” to monitor dorm recycling bins and visit a local recycling facility, where students don rubber gloves and sort through bins to assess how much of the contents are actually recyclable. The program also conducts periodic “Zero-Waste Events,” in which they collect dining hall waste and use it for composting projects on campus.¹⁰

Other Research Endeavors

Though our research focused primarily on the waste audits, we also looked into a number of other measures that, though not all directly related to composting, could certainly compliment

⁹ http://www.utenvironment.org/content/index.php?option=com_content&task=view&id=56

¹⁰ <http://ucscetec.com/leadership-opportunities.html>

UCLA's current sustainability efforts on the Hill. One particularly interesting find was electrolyzed water, an environmentally friendly and effective alternative to harsh chemical cleaning products. An electric current is run through ordinary table salt and tap water; the result is a chemical reaction that produces a cleaning/degreasing agent (sodium hydroxide) and a disinfecting agent (hypochlorous acid). Fortunately, UCLA Housing & Hospitality Services is already in the process of purchasing and piloting electrolyzed water equipment, according to the office's Sustainability Coordinator Robert Gilbert. We also worked with Hilltop, a small student convenience store located on the Hill, to implement a few basic sustainability best practices in the store, including eco-friendly notebooks in plain sight and selling energy efficient compact fluorescent bulbs. With the help of Jan Griwach, ASUCLA Director of Computers and Supplies, the changes were quickly implemented. Also, we researched the Sun Chip brand after noticing that Sun Chip bags were a major component of dorm room trash; this is because BruinCafe, one of four quick-service eateries on the Hill, offers Sun Chips (and no other chip brands) as a side item to meals. Among other environmentally conscious practices, the Sun Chip brand plans to switch to a fully compostable bag, the first of its kind, by 2010¹¹.

Recommendations

First and foremost, the waste audits provided valuable data concerning the feasibility of compost programs on campus. We have shown that when the resources are made available, students will sort out their compost, provided they are properly informed beforehand. As mentioned in the previous section, several minor recommendations that we have striven for have already been accomplished. Having accomplished these small successes, we hope that the data produced through our research will be used to create much more impactful changes. We hope, above all, to make one critical point: a composting program in on-campus housing is feasible,

¹¹ http://www.sunchips.com/healthier_planet.shtml?s=content_compostable_packaging

has a high probability of success, and would achieve an impressive waste diversion rate with minimal effort. Our data show that over half of the total waste thrown away by students can be collected as compost. Combined with the roughly 30% diversion rate achieved by the already existing recycling program, a diversion rate of 80-85% could very feasibly be achieved over the next year. Such a figure fits in nicely with the 75% overall waste diversion by 2012 target elaborated in the University of California's *Policy on Sustainability Practices* document¹².

Perhaps the most important aspect of this research is that everything detailed in this report was accomplished by a group of only seven undergraduate students over the course of five months, working on the project in addition to their normal coursework as full-time students. Given additional time and resources, there's no limit to the scale or success of an institutionalized compost program. Outreach and composting education could be incorporated into freshmen and transfer orientation, move-in week, floor government, and resident association programming. Implementing composting in this manner would have far-reaching impacts. During their time living on-campus, students could come to make composting as second nature as recycling is today and take their knowledge and habits with them as they move on in life to other endeavors. Through our audits, 268 total residents were given an inside look at how they can contribute in a big way simply by altering their waste habits; expanding this to over 9,300 living in on-campus housing could have far-reaching impacts.

Logistically, long-term composting on one or more floors would create some issues. The large amount of compost produced daily would be a challenge to collect on a per-floor basis. To remedy this issue, we suggest that the existing trash chutes be converted to compost/food waste chutes. One large bin per floor would then be provided for trash, much like the large recycling bins already on each floor. In the residential buildings currently set for construction on the Hill in

¹² http://www.universityofcalifornia.edu/sustainability/documents/policy_sustain_prac.pdf

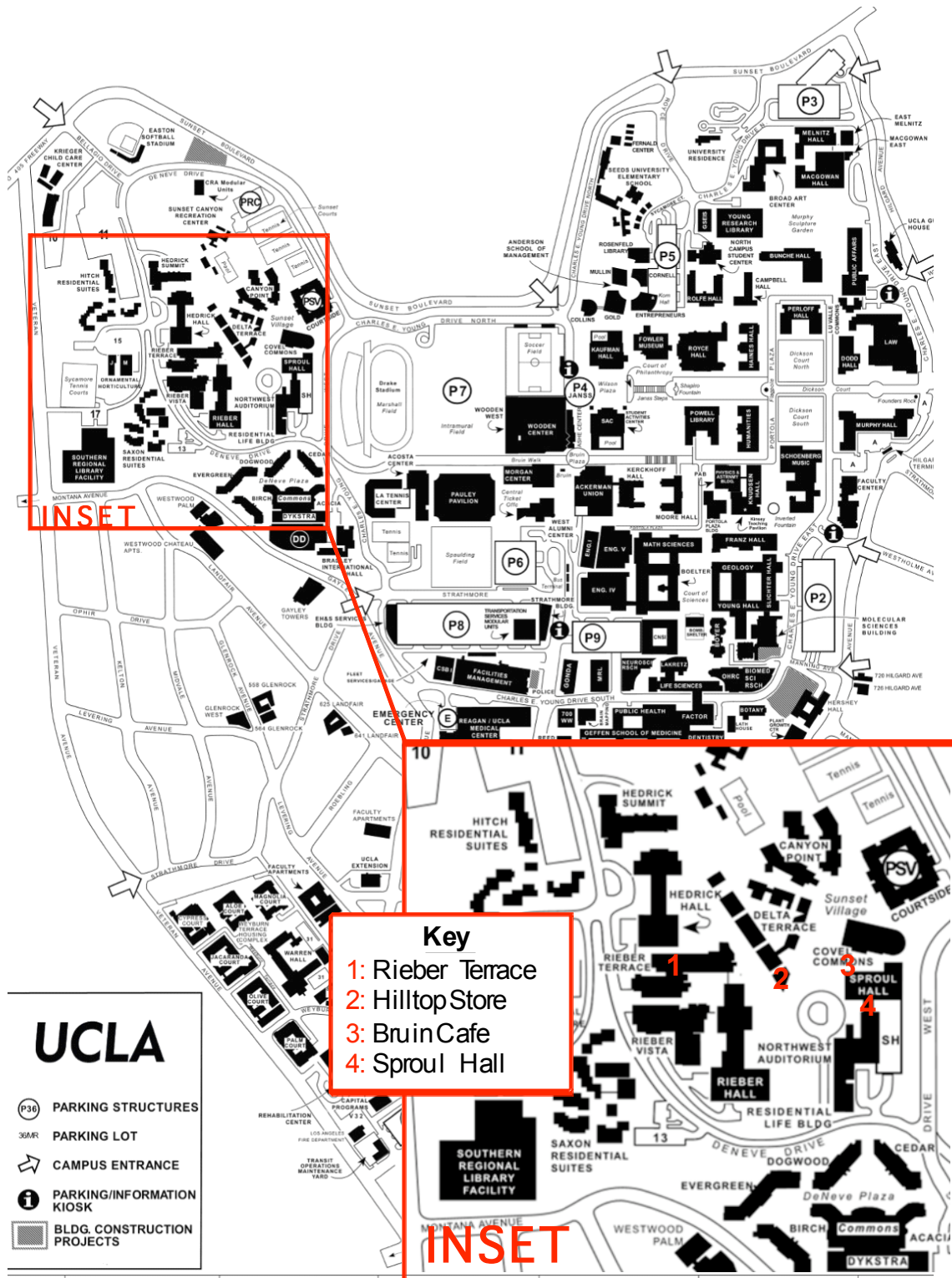
the next few years, plans are in place for two chutes per floor – one for trash and one for recycling. We suggest that these chutes be designated for compost and recycling instead, with only a large trash bin installed on each floor, which could be taken out daily in a fashion analogous to Housekeeping’s current protocol for recycling. In fact, given high enough diversion rates, this could potentially lessen the Housekeeping staff’s burden, as overall trash produced would be less than what is currently being put into the recycling bins.

In closing, we feel that implementing an in-building composting program in UCLA on-campus housing would be extremely beneficial, with little downside, and thus should be seriously considered by all relevant parties on campus. In our opinion, the sheer scale of potential waste diverted through an in-residence composting program warrants its serious consideration. Residents who have already participated in the waste audits were generally very happy with the program and many expressed the desire for the program to be made permanent and institutionalized. Additionally, implementing a waste-diversion program of this scale would bring UCLA to the forefront in college and university waste-diversion efforts – with other institutions potentially looking to UCLA as a model in waste reduction and environmental stewardship. An institutionalized compost program would be a definite highlight on UCLA’s sustainability resume, something that today’s generation of environmentally conscious college applicants will take note of.

References

- “About Dorm Composting.” Bard College. http://inside.bard.edu/community/projects/dorm_compost/index.html
- “College Eight – Nurturing Green Entrepreneurs.” University of California – Santa Cruz. <http://ucsctest.com/leadership-opportunities.html>
- “Composting.” Middlebury College. <http://www.middlebury.edu/administration/enviro/initiatives/food/composting.htm>
- “Composting - Basic Information.” Environmental Protection Agency. <http://www.epa.gov/wastes/conservation/rrr/composting/basic.htm>
- “Frequently Asked Questions About Landfill Gas and How It Affects Public Health, Safety, and the Environment.” Environmental Protection Agency. <http://www.epa.gov/landfill/faq-3.htm>
- “Grinnell College Dorm Compost Guide.” Grinnell College. http://www.grinnellwiki.com/images/d/d4/Grinnell_College_Dorm_Compost_Guide.pdf
- <http://www.recyclemania.org>
- http://www.utenvironment.org/content/index.php?option=com_content&task=view&id=56
- “University of California Policy on Sustainability Practices.” University of California. 22 March 2007. http://www.universityofcalifornia.edu/sustainability/documents/policy_sustainability_prac.pdf
- “Why Make A Better Bag?” http://www.sunchips.com/healthier_planet.shtml?s=content_compostable_packaging

Appendix A: Map of "The Hill"



Appendix B: Bin Diagrams

Appendix C: Examples of Signs Used During Audit

The following are examples of some of the signs that were put up in the three audits. This is not a comprehensive list of all signs put up, but rather a sampling of the outreach measures we utilized to achieve our results. Most signs were reused for multiple audits – any with specific information relating to a specific floor or dates were updated for subsequent audits.



Figure C1: Sign posted on floor trash chutes

WHY COMPOST?

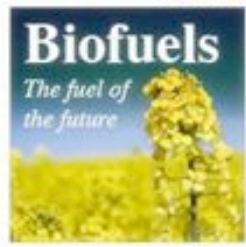
Starting Sunday, Sproul 2S is kicking off the first ever **Zero-Waste Program** from 5/3 to 5/10, where YOUR floor tries to divert 100% of its waste stream from landfills through composting and recycling!. As part of the program, compost and trash bins will be placed in your lounge to use instead of the trash chute. **During this time, the 2S trash chute will be locked.** This sheet will give you the low down on why we're doing this – and **why your individual effort makes a BIG difference.**

ORGANIC WASTE is more than just apple cores and vegetable scraps. We can compost so much more: meat scraps, dairy products, spudware, even Rendezvous, BruinCafe, and Puzzles paper food containers – almost everything that doesn't contain plastic, metal, or glass! Here are a few of the many reasons why composting makes sense:

1. **BAD LANDFILLS:** Everyone wants fewer landfills. Harmful chemicals found in landfills can escape, contaminating the local water and air. In addition, landfills produce large amounts of methane – a potent greenhouse gas and contributor to **global warming**. But there is a solution: **80% of waste currently in landfills could have been recycled and/or composted!**



2. **WHY COMPOST:** Through composting, organic waste biodegrades into nutrient-rich soil, which can be sold and used for growing a wide variety of plants. In addition, some of this organic matter can be converted into clean burning biofuels!



3. **IT'S REALLY EASY:** Just throw your organic waste into the designated bins in your lounge. (Just no plastic, metal or glass.) Signs posted on each will list exactly goes in which bin. We'll take care of the rest!

A Project of the Education for Sustainable Living Program at UCLA

Figure C2: Informational sign explaining benefits of composting


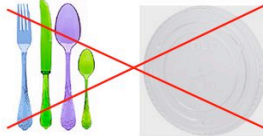
COMPOST

YES

- ALL FOOD ITEMS
- Paper food containers, drink cups, milk cartons, and spudware from Rendezvous, Bruincafe & Puzzles
- Napkins & paper towels
- Pizza boxes
- Fabric softener sheets
- Lint

NO

- Any plastic, metal or glass
- Drink lids or straws
- Bruincafe soup containers, smoothie cups, coffee lids, and cereal cups
- Rendezvous oatmeal lids
- Plastic silverware
- Cleaning products
- Personal hygiene products

TRASH

YES


- Chip bags
- Candy wrappers
- Plastic bags & silverware
- Cosmetics/make-up items
- Condoms & feminine products
- All non-recyclable plastic, metal, and glass

NO


- All hazardous materials
- Ink cartridges – can be recycled at Sproul front desk
- E-waste: cell phones, computer supplies, batteries, etc.
- Aerosol cans

All of the above items release harmful chemicals when dumped in landfills. Dispose these at the UCLA E-Waste center
<http://www.ehs.ucla.edu/pub/UCLA%20S.A.F.E.%20Center%20Flyer.pdf>



RECYCLING



YES

- Drink lids and straws
- Rendezvous oatmeal lids
- Bruincafe smoothie cups, cereal cups, coffee lids & soup containers
- Paper – newspaper, printer, notebook & color paper
- Cardboard
- Plastic bottles (empty)
- Aluminum cans (empty)
- Glass bottles (empty)
- All plastic labeled #1 through #9

NO

- Any food-contaminated items (ex: pizza boxes, napkins)
- Milk cartons from Bruincafe
- Plastic silverware




Figure C3: Yes-No item list posted on and above lounge bins

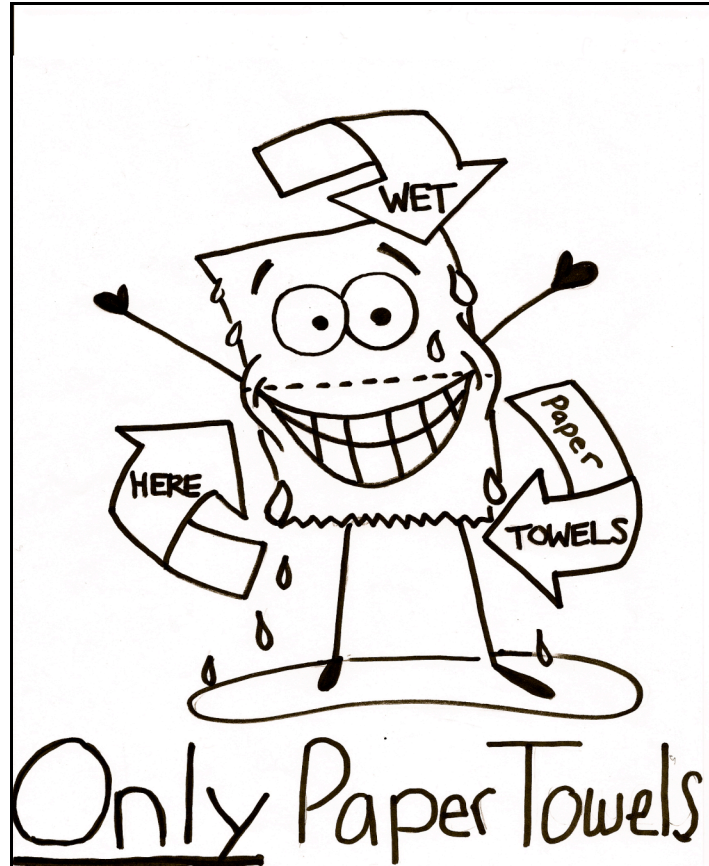


Figure C4: Signs posted on and above bathroom bins

<p>Happy oranges make happy compost.</p>  <p>Donate orange rinds to the food waste bin. Happy compost makes happy residents. <small>(Bins located in the lounge)</small></p>	<p>Enjoy your banana? Let Mother Nature enjoy the peel!</p>  <p>FOOD WASTE</p> <p>Good for the banana. Good for the environment. Good for you. <small>(Bins located in the lounge)</small></p>
---	--

An apple a day means more food waste. Hooray!



Trade apple cores for karma points.
(Bins located in the 2S lounge from 5/3 to 5/10)

IT'S COMING...

THE NEW & IMPROVED WASTE AUDIT IS COMING SOON TO RIEBER TERRACE 3RD FLOOR



Check out the flyer in your room for more info, or talk to your RAs.

Figure C5: “Silly” signs posted in floor lounges 3-5 days prior to startup of audits