

ZERO WASTE FOOTBALL

Behavioral Change Group

Global Sustainability, Fall 2011 Prof. Phoebe Crisman

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Mission Statement:

Develop a method to reveal people's knowledge about a Zero-Waste concept and to effectively use this information to alter their behavior to promote a zero-waste initiative.

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Abstract:

Zero Waste Football is an initiative to convert all of the products used at Scott Stadium to either compostable or recyclable materials in an effort to send zero waste to landfills. Specifically our group was tasked with figuring out the best way to encourage people to physically recycle and compost, which could then be implemented at football games. We focused on people's behavior in general rather than on focusing on the behavior of football fans. We went about this by creating an online survey to figure out people's preferences, and we created a prototype of a sign influenced by the survey responses. In addition we conducted an experiment at the Pavilion XI to see how effective our signage was. From the survey we found that most people knew what to compost but not what to recycle. Further, most people felt they recycled only moderately. In the experiment, we found that including both specific images of recyclable and compostable materials used, as well as having text on a sign is most effective. However, we also found that to be optimally effective, the venue would need to have substantial recyclable and compostable materials as well as proper receptacles for each.

Introduction:

Waste has become a prevalent issue in our world and consequently, at the University of Virginia. The problem is exacerbated by the lack of common knowledge of recycling and composting as well as the existing habits of the general public. The problems associated with sending all waste to landfills include consumers not seeing the waste flow or the direct consequences of depositing trash in large amounts. As population is bound to increase, along with trash flow, one way to bypass the landfills and reuse our materials is the concept of a zero-waste initiative. As a way to test the principles behind zero-waste, we have chosen University of Virginia football games to apply our ideas. Before examining the project further, the concept of a zero-waste initiative should be explained. Ultimately, all waste would be made recyclable or compostable; however, our goal is to decrease the amount of waste going to landfills by converting Scott Stadium to a recycling- and composting-friendly environment.

This is an achievable goal for the University of Virginia, as four notable universities have already implemented programs similar to what the University of Virginia's Zero Waste Football has in mind. These four universities include Akron, Ohio State University, University of Colorado at Boulder and Michigan State University. In Ohio State's inaugural zero-waste season, they sought to divert 90% of their trash from the landfill after their first home games. In reality, they were able to achieve 74.2%, recycling 37.3 tons of material and kept 4.9 tons of food from landfills. As a new program, a major implementation of the program was the process of evaluating themselves after each game to note areas of improvement to help them reach their 90% goal. Knowing that other universities around the United States are implementing similar goals gives us confidence that we can influence spectators at University of Virginia football games to change their recycling and composting habits for the better.

Project Definition:

Due to the large scale of this greater goal of establishing Zero-Waste at University of Virginia football games, our group is specifically focusing on behavioral changes among the fans to promote recycling and composting. Our aim is to convince people to participate frequently by recycling and composting automatically.

With the help of a few key people we will be able to narrow our approach to get the best results possible. Jess Wenger, head of Environmental Health and Safety at UVa, plays the role of our project mentor; she was also a key resource as she approved our survey questions and helped us develop our project. Jess is the information we obtain will go towards the larger project proposed initially by Matt Boegner and Ashley Badesch. Matt and Ashley are current UVa students that started the project in 2010 and are continuing to progress the initiative. They were able to help us move along with our project and give us helpful feedback

after our initial setback. Jason Bauman is the Associate Director of Facilities Management for Athletics. It was his decision on what actions could or could not be taken in Scott Stadium. Our resources include the project conversion group, as they informed us of the products that will be used during football games, and the precedents group who helped offer information for us to understand the background and also success and failures of other universities.

Approach:

Initial Approach

There were two main ways our ideas took form. The first was the idea of educating the general public and creating awareness about the zero-waste initiative, and the second focused more on specific ways to guide behavioral change. We mainly focused on the first objective as we began our project.

Our original mission statement was to develop a method to reveal people's knowledge about a Zero-Waste concept, and educate them in the process through demonstration and publication. Initial plans included collecting data on the current habits of football game attendees through observation and the use of surveys. Surveys were intended to provide insight into what the public attitudes on composting and recycling are, as well as what level of previous knowledge exists. Some of the questions in our initial verbal survey included:

- -Do you know what zero-waste is?
- -Do you know what materials are recycled versus composted?
- -Would you be willing to recycle and to compost at the football games?

We ultimately planned to use these responses to understand and to gauge potential support in our efforts. We also intended to expose the University of Virginia students and game spectators as to what zero-waste games mean and how to compost and to recycle the waste. Ideas of spreading information included posters or fliers, e-mails, word of mouth, a Cavalier Daily ad, and a short video on the Scott Stadium television screen. We were then going to take a second survey to gauge how effective signage and exposing the public to the zero-waste initiative actually would be to change their behavior. However, after contacting authorities, we realized that surveying at a football game was not a feasible option.

Modified Approach

This forced the group to take a change in direction, and we began to focus on another idea. The second aspect we had initially put aside was to research on people's current behaviors and the ways we could effectively alter this behavior. We came up with alternative solutions that would still maintain our general theme in helping us gather information on how a person's behavior could be affected in the specific area of recycling and composting. As such we decided to do an online survey where were not only be able to ask more questions but also reach a larger and more diverse sample group than a verbal survey. From these surveys we were able to glean insight into people's basic knowledge of recycling and composting. An example of a question we included had a group of compostable and non-compostable materials and our sample group had to choose which items were compostable. Some materials included were part of the list the product conversion group worked on to find sustainable alternatives to these specific products that are either plastic-lined or fully plastic: food boats used for wings, foil and wax for hamburger and hotdog bags, popcorn bins, fry-cups, hot beverage cups, nacho trays, plastic wine and beer glasses, and souvenir cups. Another question gave an example of different types of posters we would place in front of the receptacles and asked what our participants thought would influence them the most: descriptions, images, or demonstrations from volunteers.

The surveys provided us with information that we used to fully conduct our experiment. The experiment was designed to evaluate the most effective way to encourage people to recycle and compost. The experiment was conducted at the Pavilion in Newcomb Hall, which the main thing that can be recycled are bottles. We made a sign that demonstrated the items that could be recycled. We posted this sign above a trash can adjacent to a recycling bin. We then proceeded to observe for two hours the number of people who read the sign and followed the sign, read the sign and then threw recyclables in the trash, and those who did not read the sign at all. We deliberately chose the hours from six to eight, right before closing, as we had prior knowledge that this would be one of the busier time periods. From our observations during this experiment we expected to see the willingness of participants to recycle, and what initial actions and reactions the participants have.

Through these different modes of gathering information we are not only striving to educate people in a zero waste project and in turn learn more about their recycling and composting behaviors, but also discovering effective strategies in order to successfully implement a zero-waste initiative at University of Virginia football games.

Timeline:

Tuesday September 20th: Group met and discussed project definition.

Tuesday October 4th: Second group meeting.

Week of October 9-15 (Katie): Contacted via e-mail Jason Bauman in the Athletic Department and cc in Jessica Wegner, Environmental projects manager to see if carrying out our survey is a feasible option.

October 15th (Game day) (Everyone): Planned to carry out first guestion and answer survey.

Week of 16th-22nd (Anna): Contacted Megan Watson of conversion group to obtain a list of recyclable versus non-recyclable materials and compostable versus non-compostable materials.

Monday October 31st: Meeting to discuss alternatives after finding that our initial plan was not feasible (see appendix for email)

However, after we changed directions we designed a new timeline to fit our schedule and goals:

November 3rd: Our group constructed specific survey questions and sent it out via Facebook groups, Global Sustainability class email, available Listservs, etc.

November 6th: Group meeting where we wrote the survey questions.

November 15th: Group meeting with Matt to discuss specifics of survey.

November 17th: Our group collected the data and brainstormed ideas for the signs (Katie and Chad researched the prototype sign for football games and Anna and Heidi created the actual signs we used in the experiment).

November 27th: Group collected and compiled data into concise graphs and charts.

December 5th: (Anna) Printed out sign at A-School.

December 6th: Ran experiment in Pavilion X from 6 PM- 8 PM.

December 7th: Analyzed experiment and compiled photographs.

December 8th-10th: Gathered information.

Documentation and Assessment:

Survey

As we mentioned in our approach, we designed a survey on Survey Monkey in order to reach a wide range of people utilizing the Internet. Below are the questions that our group and Jess Wenger collaborated on in order to gather the best results with the least amount of questions.

On a scale from one to ten, how much recycling do you do?

Our Zero-Waste Initiative is a project to have the majority of waste at the UVa football games recycled and composted. How willing are you to participate?

(Yes, Maybe, No)

Would recycling and composting containers need to be right next to each other for you to more easily participate in a Zero-Waste effort?

(Yes. No)

What action(s) will be needed to motivate you to partcipate in a Zero-Waste effort?

(Signage with words only, Signage with words and pictures, Signage with demonstration (i.e. volunteers standing next to containers), Other (please specify))

Which of the following would go into a recycling bin?

(Plastic Bottle, Wax-lined Hamburger Tray, UVa's Popcorn Containers, Pizza Boxes, Souvenir Cups)

Which of the following items are compostable?

(Pizza Boxes, Hot Beverage Cups, Nutshells, Wing Trays, A Majority of Foods)

From each question we were able to obtain much data of people's knowledge about a Zero-Waste initiative. With a one to ten scale for Question 1, we got an idea of how much people actually recycled in their everyday life. Not only did we get a grasp on people's current recycling effort, but we also could see how willing people would be to support our Zero-Waste project, which rolls over to Question 2. According to Figure 1, the majority of our responses fell between a 5 and 8, which shows that people presently recycle moderately, and the graph resembles a bell curve. With the option of allowing comments for our questions on Survey Monkey, we could get additional feedback from our responders. For Question 2, one participant exclaimed, "Bare in mind that a fair percentage of students will be drunk at the game, therefore it is very important to make it as easy as possible for them to recycle." This concept has been brought up before, but with the right persuasion and commitment to the program, inebriation should not be a problem.

Furthermore, Questions 3 and 4 helped us in our experiment we conducted in the Pavilion. We found that 90.0% of our responders suggested that we ought to have the recycling and composting receptacles right beside each other. So, in our experiment we put the trashcan and recycling bin right beside each other to

uphold the results from Question 3. Question 4 gave us the influential amount of information for our sign because it essentially told us what to put on it. 73.5% said that a sign incorporating words and pictures would motivate them the best, while 31.6% supported a sign with only words and 15.3% suggested that we should combine a sign with volunteer demonstration. For our sign, we combined text and specific pictures plus materials that should NOT go in the receptacle.

Questions 1-4 gave us insight on how willing people are to commit to Zero-Waste and how to motivate them, but Question 5 and 6 revealed how much people actually know about recycling and composting. Figure 2 displays the percentage of people who thought the products would go into a recycling bin. Fortunately, 100% knew that plastic bottles are recyclable, but every other product in that question is not recyclable. From this, we see that assume that all plastics can be recycled and that most other items can also be recycled. Question 5 reveals two things, 1. People believe that most plastics are recyclable and 2. The majority of the products offered at Scott Stadium cannot be recycled at all. In addition, our responders actually did better on Question 6, which asked people to choose which items are compostable. Before our survey, we thought that most people would not know which products could be composted, but in reality they did. Of the five products, pizza boxes, nutshells, and the majority of foods were the actual compostable goods. 90.9% chose the majority of foods option, 86.9% chose nutshells, and 47.5% even knew that pizza boxes could be composted (see Figure 3). In all, our six question survey showed us how willing people are to participate, what to put on our sign, and how much people truly know about recycling and composting.



Figure 1 Bar Graph displaying the responses we gathered from Question 1 of our survey, which was "On a scale of one to ten, how often do you recycle?"

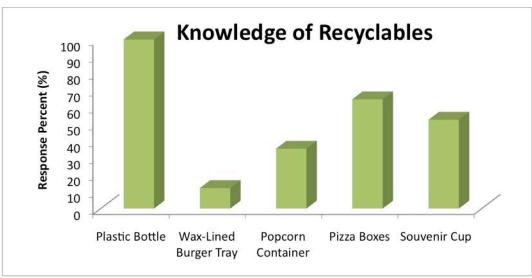


Figure 2 Bar Graph displaying the responses we gathered from Question 5 of our survey, which was "Which of the following would go into a recycling bin?"

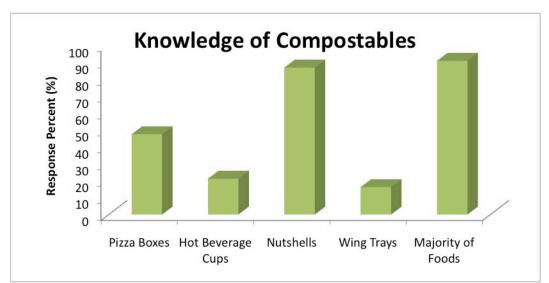


Figure 3 Bar Graph displaying the responses we gathered from Question 6 of our survey, which was "Which of the following items are compostable?"

Experiment

For our experiment, we arrived at the Pavilion XI at around 6:00 P.M., and put the sign up above an adjacent trashcan and recycling bin. We observed from a table across from the sign, and waited for people to approach. It was relatively crowded, however, there were few with recycling goods. The majority of the patrons used the wax-lined Pepsi cups instead of recyclable ones. In our two hours at our post, we encountered only four people with recyclable goods. Of the four, three correctly disposed of the recyclable goods, but one patron threw away his recyclable (Gatorade bottle) in the trashcan.

Although there were not many patrons with recyclable goods in the Pavilion, we were still able to gain some knowledge. People who walked in front of the trashcan to throw away items did notice our sign even if they did not have a recyclable good.

Things we noted that worked in our experiment were that people who walked in front of the trashcan did notice our sign, as it did catch people's attention, even if they had no recyclable items. Judging by other signage, we noticed that the best way to influence patrons is through the combination of pictures and words.

Since there were already many "Green" related signs around the Pavilion, our sign did not really stand out from all the rest of the many signs. Another improvement could be to use a larger sign, with more attention-grabbing qualities, and to use more than one sign around the Pavilion.

Another issue we encountered was that during the time we chose to conduct our experiment patrons were allowed to use a meal swipe for their food and a fountain drink. As such people were more likely to use the wax-lined Pepsi cup instead of buying a recyclable bottle because of the cheaper deal. Perhaps if we went a different time when meal swipes are not available, we would have gotten different results.

Overall, our experiment proved worthwhile, and gave us positive results. However, there is definitely room for improvement.

Project Dissemination:

Our project results first and foremost will go to benefit Matt and Ashley's larger project of Zero Waste Football. The goal is for our research to be able to provide convincing information that not only do University of Virginia students care about implementing a zero-waste initiative at the football games, but also that if Zero Waste Football were to become a reality, there would be effective results in the correct products being placed in the correct receptacles. For more publicity within behavioral change, we plan to put in a public service announcement with our results and findings to the Cav Daily to further educate the students and community of University of Virginia about Zero Waste Football.

Conclusion:

We conducted a simple survey and experiment to begin to understand the general public's perceptions and actions on recycling and composting. We brainstormed ideas for what products and signage are needed to promote behavioral change. Elaborating on the survey and experiment, we have analyzed behavior and willingness to participate in the future.

Currently our project is more about the general understanding of the public, if we wanted to get a more concise understanding we would attempt to cater more towards the football fans. Especially after the findings from the survey, we realized that many of the people we gained information from do not attend the football games.

To assess our work we used notes to write down our experiment results. And we used Excel to make graphs to analyze our survey results.

Future Work:

To expand on Ashley and Matt's project and to develop our own work further, we could either cater more specifically towards football fans, or should make the zero-waste initiative a university wide effort. If we were to focus on football fans, we could redo our experiment to actually gain information from football games. If we were to focus more broadly on the University, we could put receptacles around grounds to observe their effect. Specifically this could include dining halls and other cafes, libraries, general events, as well as smaller sporting events where we could begin to see results on a smaller scale.

Lessons Learned:

From the Survey

- -People know about recycling and what it is but not necessarily about the details meaning they do not really know what materials are recyclable.
- -People surprisingly knew more about composting than we initially anticipated.
- -Signs with text and pictures are the best form of signage to motivate people.
- -Currently, people only moderately recycle in their everyday lives.

From the Experiment

- -People are habituated to posters about recycling and green initiatives around grounds. In order to truly make an impact there should be a uniform effort across the university or specific ways to stand out and differentiate from other efforts.
- -More products should be recyclable than they presently are.

Budget and Funding:

Since we are just one portion of a larger project, our cost only consists of the printing for signage for our experiment. This will be funded through our individual donations.

Appendices:

1. On a scale from one to	o ten, how much recycling do you do?	Create Chart	Download
		Response Percent	Response Count
1	I	2.0%	2
2	1	4.0%	4
3	-	8.0%	8
4	_	10.0%	10
5	_	17.0%	17
6	_	13.0%	13
7	_	17.0%	17
8	_	17.0%	17
9	_	11.0%	11
10	1	4.0%	4
		answered question	100
		skipped question	0

Figure 4

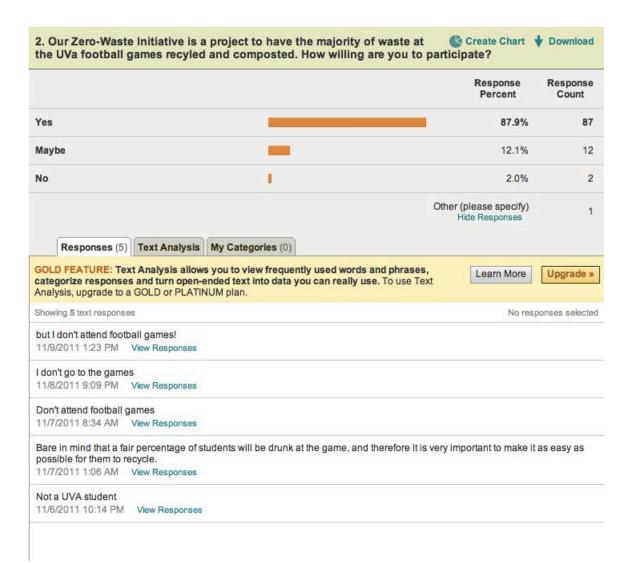


Figure 5



Figure 6



Figure 7

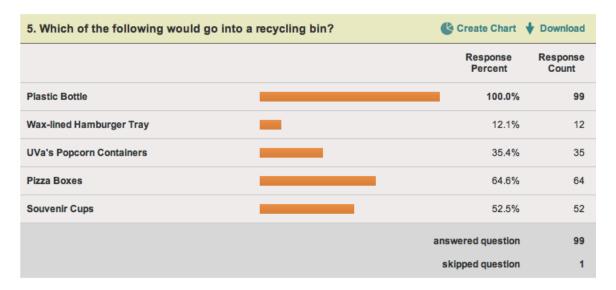


Figure 8



Figure 9

Zero Waste RECYCLE

GLASS

All glass food & beverage containers (All colors)



Plastic containers #1-7
NO plastic without a number
NO plastic bags or wrapping
NO Styrofoam or packing foam





Global Sustainaility Project

Figure 10 is the poster that we used in our experiment at the Pavilion.

Hi all.

Below is a summary of things with next steps. Let me know if you have any questions.

What the administration is interested in is more of "future" actions of attendees if a change were to take place. A possible test was given to see how the results of recycling / composting would be if 1) A new stream was set up for waste (add a composting can or a recycling can if not one there already) and 2) volunteers were placed at one set of new-stream receptacles versus only signage at another. This experiment could also be done at really any large university event.

If a survey is done, stopping individual patrons and approaching them (as opposed to giving out surveys en masse) to discuss the survey and ask questions (or administer a survey) would be best. Try to get at IF they would change their behavior and to what lengths the would be willing to do so. Generally – more of trying to figure out if and how behavior might change if new receptacles and options were added.

I would concentrate on possible signage ideas too, a few specific ways to spread the word about recycling (see how other universities have done this), and how a short study that would measure how behavior might change after new options were added (like – what if there were no "trash" – would people be confused? What would the response be? Etc).

Get specific on a simple study idea – don't shoot for too much, but a concise survey / experiment that is well designed and able to be carried out, possibly at a couple of events. Possibilities in other UVa events also – and narrow down any educational initiatives (think of a couple key ways that are feasible for a semester to spread the word and see if more possibilities arise).

I'll be distributing your concept design plan to our community partners to review (Jess, Matt, Ashley) – but if you're stuck, please let me / them know and we can work together. I realize it's a bit daunting to try to design a survey and get logistics together on how it will all work.

If people need to coordinate something inside the stadium during a game, they should email both Jason Bauman and Mike Stroud in Athletics. Direct the email to Jason and cc Mike. That way they are both in the loop and can decide between themselves who should respond - jb3t@virginia.edu and mjs6re@virginia.edu.

One last thing: when you contact these folks, make sure they know overall what you're working toward and what your group's focus is - if you leave the discussion open a bit, they could be helpful in unexpected ways.

Tom Gibbons
UVa - M.Arch Candidate 2013
Master of Environmental Mgmt - Yale University F&ES - 2010
tsq7ph@virginia.edu

Figure 11

Hi Katherine,

I have been asked by Mr. Bauman to let you know that he does not want the class surveying or interacting with fans during the football game. I am awaiting confirmation at to whether this only applies to fans inside the stadium or whether that also includes tailgaters and others outside the stadium prior to the game. I have not heard back on this issue, but based on the wording of his initial email to me, I am operating on the assumption that he does not want any fans surveyed.

Unfortunately it looks like it's back to the drawing board, at least with the survey. If I hear anything else, I will let you know, but my current instructions state that the class cannot survey or interact with the fans. I'm sorry to be the bearer of bad news!

Don't hesitate to let Ashley or Matt or myself know if you need any help coming up with alternative ideas!

~Jess

Jessica Wenger Environmental Projects Manager Office of Environmental Health and Safety

University of Virginia Phone: <u>434-982-5540</u> Cell: 434-531-0334

Figure 12

Hi Katie,

I think all of these questions are great. I'm assuming that for 4 and 5 you'll have a list or pictures or something for people to choose from. I think this is a great approach, in light of the fact we're not allowed to survey the football fans.

Thanks for coming up with a great alternative project. I think this data will be just as valuable as if you'd surveyed the fans themselves.

Let me know if there's anything I can do to help! Have a great weekend!

~Jess

Jessica Wenger Environmental Projects Manager Office of Environmental Health and Safety

University of Virginia Phone: <u>434-982-5540</u> Cell: <u>434-531-0334</u>

Figure 13

Hi Anna,

Nice effort. My suggestion would be to use pictures of items that are actually sold in the Pav, like the Snapple bottle you picture, rather than generic bottles and cans. Things like silverware and other items that people might not know can be recycled would be good. Just a suggestion, but I know some of the libraries have started putting up targeted signs to show what items that are sold in the associated cafes can be recycled. Granted, you can't put a picture of every soda can and bottle that the Pav sells, but a few pictures of common items they sell thrown in with a few lesser known items (do they still sell yogurt in plastic containers – not many people know they can be recycled) might attract a little more attention.

I assume you've made contact with Kendall from UVa Dining to get the okay to put up signs in the Pav. I'm meeting with Dining's marketing manager today on another topic. I'll check in with her to make sure she doesn't have any issues, as she's in charge of all signage in Dining areas. How many days are you hoping to have the signs up?

Thanks!!

~Jess Jessica Wenger Environmental Projects Manager University of Virginia Environmental Health and Safety T: 434-982-5540 C: 434-531-0334

Figure 14

Hey guys! Sorry for the late response but we just consolidated this list yesterday. These are the products that need to be converted:

Products that we are working to find more sustainable alternatives include: food boats (used for wings, plastic-lined), foil/wax hamburger and hotdog bags, popcorn bins (plastic-lined), fry cups (plastic-lined), hot beverage cups (plastic-lined), nacho trays (#6 plastic), and plastic wine and beer glasses (#6 plastic), Souvenir cups (#7 plastic)

Thanks, Megan

Figure 15

Hi Anna,

I just wanted to follow up after my meeting with UVa Dining. The marketing manager is fine with the signs being put up. Do you know what hours you are planning to be there next Tuesday? She just wants to let the Pav manager know.

She also requested that any products featured on the sign be products that they sell. They don't sell Snapple, but Pepsi products or anything else you see for sale in the Pav is fine.

Thanks for your efforts! Just let me know about the timing and I will pass it along.

~Jess Jessica Wenger Environmental Projects Manager University of Virginia Environmental Health and Safety T: 434-982-5540 C: 434-531-0334

Figure 16



Figure 17



Figure 18

Bibliography:

United States Environmental Protection Agency. "Recycling at Penn State's Beaver Stadium." Epa.gov. U.S. EPA, Nov. 2009. Web. Oct. 2011. http://www.epa.gov/osw/conserve/rrr/rogo/documents/beaver.pdf>.

Wright, Shawn. "Ohio State University Scores with Zero-waste Effort." Waste and Recycling News. Wasterecyclingnews.com, 17 Oct. 2011. Web. Nov.-Dec. 2011. http://www.wasterecyclingnews.com/headlines2.html?cat=1&id=1318861518.

We would like to specially thank Jess, Matt, and Ashley for giving us guidance and helpful advice throughout our project. We hope our efforts will be of service to you and UVa throughout this initiative. Thank you also to Tom for motivating us and being a great workshop leader!