



# Zero Waste Team 2019 Final Report

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## Introduction

With the entire UCLA campus focused on achieving the ambitious goal of Zero Waste to landfill by 2020, there are countless options for research and action in the field of waste reduction and awareness. After assessing all of these options, the 2019 Sustainability Action Research (SAR) Zero Waste Team decided to focus our research and education efforts on one building: Charles E. Young Research Library (YRL). Some might say one building is not enough to achieve zero waste on campus; however, the team would reply with a quote by Howard Zinn that our stakeholder, Kikei Wong, relayed to us: “We don’t have to engage in grand, heroic, actions to participate in change. Small acts, when multiplied by millions of people, can transform the world.” While it is true that YRL is only one building, it is a large center of student activity and therefore has a significant impact on UCLA’s campus and community. With the plan of implementing several strategies to achieve zero waste, YRL proved to be a perfect pilot building because of its high usage and immense potential for improvement. Focusing on YRL over the past two quarters proved to be quite an experience, both for our SAR Team and the library. From doing waste audits - sorting through all the waste produced in one day to analyze how well people are sorting their waste - to having early meetings with the library staff and installing new tri-waste and compost bins, we came to understand that one change in one building can definitely still make a big impact. Throughout this final report, the Zero Waste Team will depict these two quarters of amazing action and research in order to fulfill the goal of Zero Waste on campus.

The United States produces the most landfill waste of any country in the world. To be exact, around 1,609 pounds of waste are produced per person per year, making up 40% of the world’s waste according to Recycling Revolution. The population of UCLA on any given day

is around 73,000 people, meaning an average of 117,457 pounds of waste is likely produced on campus per year. However, recycling and compost provide other waste disposal options which can significantly reduce the amount of actual waste sent to landfills. Yet individuals and institutions often do not use these options, likely due to a lack of awareness and the necessary infrastructure to do so.

In 2007, the UC system established their Zero Waste to Landfill by 2020 goal. As of April 2019, the campus diversion rate hovers around 65%. This means that roughly 65% of all waste produced at UCLA is diverted away from landfill to either compost or recycling. In order to increase the diversion rate, Zero Waste Coordinator Kikei Wong and the Sustainability Action Research (SAR) Zero Waste Team focused on YRL as a pilot building to research the efficiency of different techniques for increasing waste diversion. Through our collaborative efforts, the library, a hub for student, faculty, and staff activity, can become a model for other buildings on campus.

## **Our Story**

When we started our program, we had many different ideas for possible projects we could do to improve waste habits on campus. However, once we decided to work with YRL, we dove right in. After conducting an initial survey of YRL, our team noticed that there were no compost receptacles in the public study areas. Additionally, there were very few recycling receptacles in the library, and the ones that were sparsely placed throughout the library were not clearly labeled and were thus effectively used as trash cans. From this survey, it was clear that the availability and accessibility of waste receptacles would be a large part of our project. At this point, our team had also established our primary research question: “How will an

education based campaign affect the waste streams created by YRL users on any given day?”

In order to measure this, we came up with a 10-week long project plan. We wanted to initially start with a baseline measurement, so we needed to complete a waste audit.

With only 20 weeks to complete our project, we knew that communication would be extremely important from the start. Luckily, our stakeholder Kikei Wong had knowledge of YRL’s current waste practices and contacts within the library management and staff. With this, we were able to arrange our first waste audit fairly quickly. We settled on having the waste audit Week 6 of the Winter Quarter, so the library would be seeing moderate activity, but not the frantic environment that occurs during finals. With some minor weather-induced delays, we were eventually able to complete our baseline waste audit during Week 7.

From there, we worked with Kikei Wong and UCLA Facilities Management to implement compost and additional recycling bins in YRL. 15 large compost and 15 large recycling bins were placed at locations that we determined would be high traffic areas in order to maximize the usage of these bins. In addition, 40 new tri-stream waste bins were placed in less frequented, but still important, areas around YRL. These bins had 3 sections (landfill, recycling, and compost) along with instructional information and images showing common items and their correct waste receptacle. Additionally, the rollout of these new bins also included an update on the liners used. Each type of waste bin now used a corresponding color liner so the custodians could tell which bags belonged in which dumpsters. Even without the educational aspect of our campaign occurring, we noticed students began using these bins immediately.

However, we wanted to ensure that these bins were actually being used in the correct way, so we proceeded with our educational campaign. By this point, Spring Break had come

and gone and we were officially into Spring Quarter. This meant we only had 6 weeks until our final waste audit, and we were running into a problem. Communication can be a major barrier, and we spent the better half of two weeks trying to contact YRL staff in the hopes of getting informational waste sorting signage that we created posted near the bins throughout the building. After a few weeks of struggling to find the correct contact with no luck, we were running out of time. Luckily, we were still able to table during this time. We tabled outside of YRL for three of the remaining weeks, twice a week for several hours, which was less than we had hoped. We still attempted to make the best of this shortened time by avoiding traditional tabling methods like flyers and speeches. We instead had a raffle for winners of a straw guessing game, complete with jars full of straws we found during our first waste audit, and a mini waste sorting game with both common and obscure items, such as takeout containers, coffee cups, and plastic utensils.

These methods were extremely effective, and we had many students and facility approach us simply to ask, “What do I do with this when I’m done with it?” Questions and comments from passersby affirmed that what we were doing was making an impact and really shined a light on how visitors and UCLA students alike are willing to go the extra 10 feet to a compost bin for sustainability. At the conclusion of our tabling campaign, we completed another waste audit to determine whether the new bins and the tabling campaign had impacted library users’ waste sorting behavior.

We immediately noticed a difference. As soon as we arrived at the library loading dock to start the waste audit, there was visibly much less trash to sort through compared to last time. We quickly realized that this was because 200 pounds of compostable waste was already sorted by students into compost bins, making the amount of waste in the landfills

significantly less. Though it only lasted two quarters, this project took a lot of planning and we definitely experienced some road bumps along the way. However, the results of that second waste audit instantly made all those challenges we had faced seem small.

## **Challenges**

Our project was not without challenges, though. One of our first challenges as a team was to create a project that would have practical deliverables, fit under the jurisdiction of our stakeholder, and leave a lasting impact on UCLA's campus. After meeting with our stakeholder for the first time, the SAR team met up to brainstorm. The possibilities seemed endless, and we soon came up with an extensive list of zero waste projects. The next time we met with Kikei, we were excited to share all our ideas with her. Much to our surprise, our ideas were shot down one by one. It turns out that many of our ideas were already being put into action. Little did we know that UCLA already had pilot programs in place to implement reusable trays in to-go dining halls, or composting bins put in the many restrooms on campus. Our large list of grand zero waste projects soon dwindled down to zero. This was our first challenge as a team; we needed to find a project and fast. It was in a further meeting with Kikei that zero waste within libraries was brought up and we all had a "light bulb" moment. Libraries are one of the most high-traffic places on campus and do not have great waste diversion programs. If our team could revolutionize the way people think about waste, we could have a tangible project.

Fast-forward a few weeks and we had set up dates for a waste audit of Young Research Library as well as plans to launch educational campaigns. Our initial meeting with library staff left us feeling positive. They all seemed like they wanted to cooperate and work

with us towards a zero-waste future. We had our first waste audit scheduled for Valentine's Day, February 14<sup>th</sup>. Unfortunately, there was a misunderstanding, and the waste we needed to sort was picked up before the waste audit had begun. After rescheduling the waste audit, we made sure to call Athens and verify with everyone involved that the waste audit was occurring so we did not face the same problem as the week before. The day of our waste audit came around and everything went very smoothly – until the rain, that is. Around 4 pm the sky started to frown upon the Zero Waste Team as we frantically tried to finish up the last few bags of garbage before calling UCLA Facilities to help us clean up. We managed to get through 90% of the waste from a single day, gathering more than enough data moving forward. In fact, it was enough data that, with the help of our stakeholder, we were able to get compost bins implemented into YRL in due time.

With our initial waste audit completed, we moved onto the second phase of our grand plan. We wanted to roll out educational campaigns within YRL which included signs above the tri-waste bins and tabling outside of YRL during library hours. We reached out to library correspondents, but a few weeks flew by and there was no response. Another email was sent and another week passed and still no reply. This was especially frustrating because we had done the groundwork and research. We had made signage to complement the tri-waste bins that were already implemented. We had all the games and tabling items ready to table outside YRL. All we needed was approval from library staff and we would start phase two of our project. Yet there was still no response from the library. We understood that the working professionals were busy, but after four weeks of silence from YRL staff, we joked that we would go to the library and search for their offices to ask them in person to approve our plans. With the help of Kikei Wong, we finally got approved to table outside YRL from

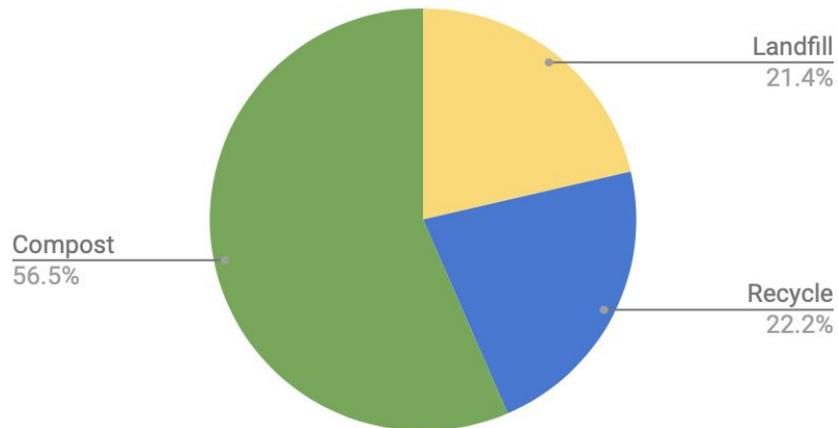
another staff member during Weeks 5-7 of Spring Quarter. Our team was very excited about this: if we could, we would table from 9am-5pm Monday-Friday. While this is impractical, we optimized our times and tabled outside YRL during peak student traffic hours.

The Zero Waste Team has had our fair share of challenges this year, but it was nothing that we could not solve without a little brainstorming. Throughout all this, our stakeholder, Kikei Wong, has been more than fantastic. All five of us have learned great lessons and skills from this project and will be grateful for years to come.

## **Results**

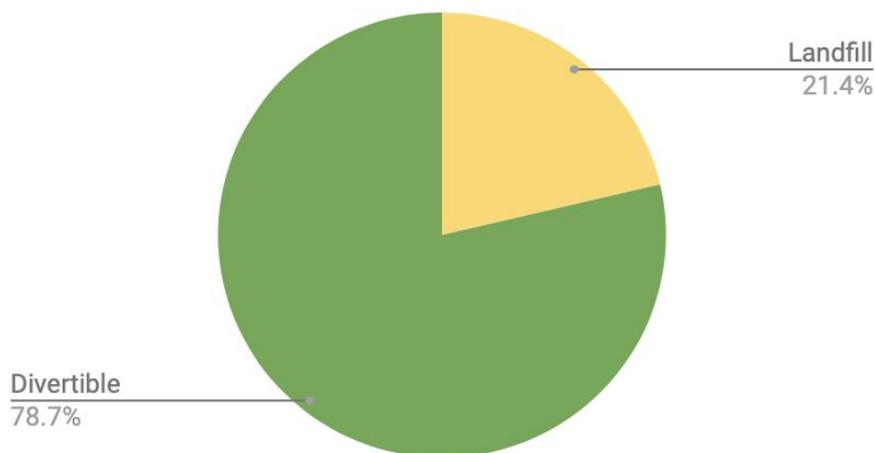
To analyze the effectiveness of the tri-waste bin implementation and the educational tabling campaigns, our team conducted two waste audits: one prior to the campaigns and one after the campaigns. Large recycling and compost bins were installed at YRL during Spring Break, the tri-waste bins were installed during Week 3 of Spring Quarter, and the educational tabling sessions were held Weeks 5-7 of Spring Quarter. Keeping this in mind, we conducted the first waste audit during Week 7 of Winter Quarter and the second waste audit during Week 8 of Spring Quarter. Our team performed the waste audits around the same time each quarter in order to control for potential changes in library use and fluctuation of waste generated throughout the quarter. For each audit, we sorted one day's worth of landfill waste produced at YRL into the three waste streams (landfill, compost, and recycle), and then weighed the sorted waste in order to determine the composition of the waste going to landfill. The results are shown below.

### YRL Waste Audit Results (2/20)



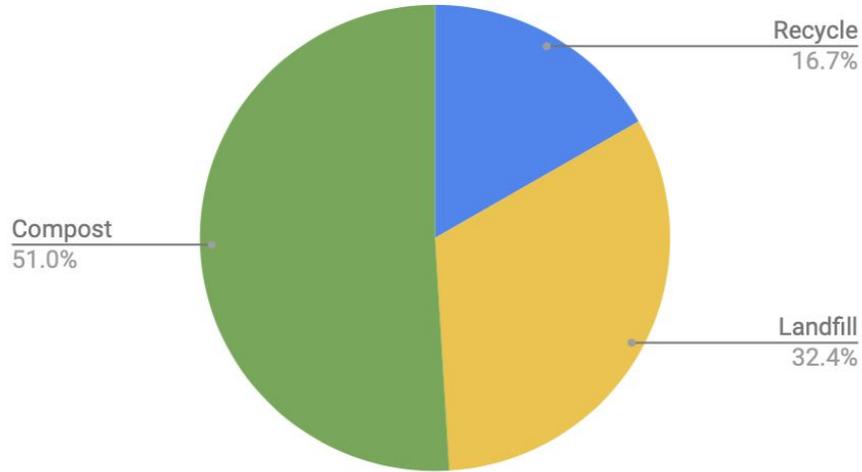
**Figure 1a.** Results of the first waste audit conducted during Week 7 of Winter Quarter. The above pie chart shows the breakdown, by percentage, of the 500 pounds of waste we sorted.

### Divertible Waste (2/20)



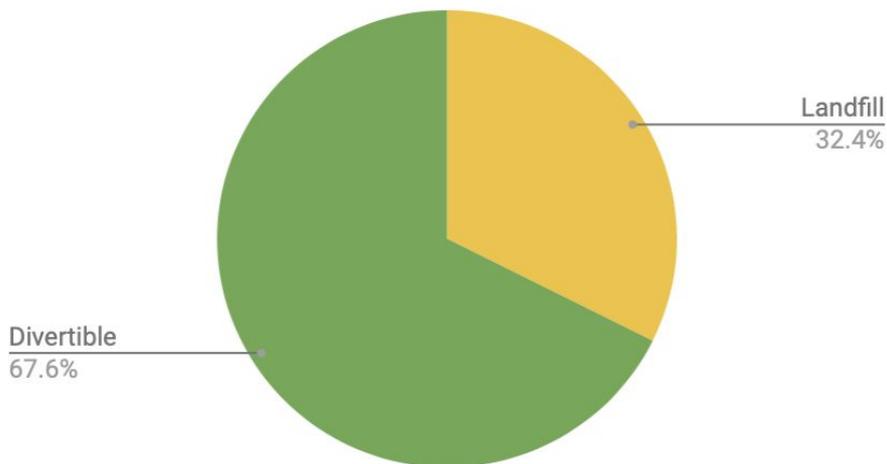
**Figure 1b.** Results of the first waste audit conducted during Week 7 of Winter Quarter. The above pie chart shows the total percentage of waste that could have been diverted to either recycling or compost.

### YRL Waste Audit Results (5/23)



**Figure 2a.** Results of the second waste audit conducted during Week 8 of Spring Quarter. The above pie chart shows the breakdown, by percentage, of the 295 pounds of waste we sorted.

### Divertible Waste (5/23)



**Figure 2b.** Results of the second waste audit conducted during Week 8 of Spring Quarter. The above pie chart shows the total percentage of waste that could have been diverted to either recycling or compost.

Comparing the amount of waste sorted from each audit, we sorted about **500 pounds** of trash in the first waste audit as compared to about **295 pounds** in the second audit. This

roughly 200-pound difference in the amount of waste sorted clearly shows that there was a significant decrease in the amount of waste going to landfill at YRL, which is most likely attributable to the installation of the compost and tri-waste bins in the library. Because it is unlikely that the total amount of waste generated at YRL changed significantly between the first and second waste audit (especially since the audits were conducted around the same time each quarter), it is clear that library users are using the new tri-waste bins and are sorting their waste into the newly available compost or recycling streams.

In comparing the breakdowns (shown in **Figure 1a** and **Figure 2a**), the percentage of compostable and recyclable materials going to landfill decreased slightly from our first waste audit to our second waste audit. The amount of recyclable waste going to landfill decreased from about 22% to 17% between the two waste audits. The amount of compostable waste going to landfill decreased from about 56% to 51% between the two waste audits. These decreases demonstrate that library users are not only using the new tri-waste bins implemented in YRL, but they are also more effectively and accurately sorting their waste. The increased accuracy of waste sorting is likely attributable to the availability of the compost and recycling receptacles in the library, as well as the helpful signage on the tri-waste bins which detail the accepted items in each waste stream.

To compare the overall diversion rates in each audit (shown in **Figure 1b** and **Figure 2b**), the diversion rate improved slightly. In the first waste audit, 79% of waste going to landfill could have been diverted to either compost or recycling, and in the second waste audit, about 68% of waste going to landfill could have been diverted. The roughly 10% improvement in the diversion rate is presumably due to the installation of the compost and tri-waste bins in the library. As stated previously, library users are more effectively sorting

their waste, which is due in part to the availability of compost and recycling receptacles and the waste sorting signage on the tri-stream bins.

Despite the 10% increase in the diversion rate, there is still plenty of room for improvement. More education and outreach would most likely be the best method of further improving the diversion rate since it is evident that incorrect waste sorting is still an issue.

During our second waste audit, in addition to sorting and weighing the waste going to landfill, we also decided to weigh the waste going to compost. We were able to estimate how much waste was being composted in the library through the use of the compost bins that we helped install. After weighing the bags of waste going to compost, we found that roughly **210 pounds** of waste were being composted. Before our project, there were no compost bins in the library, so all 210 pounds of compostable waste would have simply been thrown in the trash and gone straight to the landfill. So, although our overall diversion rate only slightly improved (as discussed earlier), the installation of the compost bins in the library significantly reduced the amount of waste going to landfill.

One final thing to note was the ongoing occurrence of waste generated by Cafe 451 located inside of YRL. In both of our waste audits, we found a considerable amount of divertible waste produced by Cafe 451, including recyclable milk cartons and compostable coffee grounds (see Appendix A and Appendix C). One aspect of our project has been trying to work with ASUCLA and Cafe 451 to address the large amount of waste produced at Cafe 451 and ensure that it is sorted into the proper waste streams. For example, our stakeholder, Kikei Wong, has held multiple training sessions for YRL and Cafe 451 staff to help inform them of correct waste sorting behaviors. We expected to see a decrease in divertible Cafe 451 waste in our second waste audit, but unfortunately, there was still a significant amount.

Because of this, it is clear that improper waste sorting in Cafe 451 is still an issue that needs to be addressed. Inputting recycling and compost receptacles in the Cafe 451 kitchen area could be a possible solution, as well as holding more frequent and consistent training sessions for staff that tend to have a high turnover rate. Providing more resources could also help, such as hanging large signs around the kitchen area or creating pocket-sized waste sorting information sheets for employees.

## **Recommendations**

Based on our research and results we have a few recommendations to improve the waste diversion at YRL. First, instructional material is imperative in ensuring that any infrastructure implemented to divert waste is utilized correctly. Educational signage is the most obvious and potentially impactful example of instructional material that could be used in the library. Signage should be clear and catchy, allowing people to easily and quickly understand how to dispose of their waste. While YRL is a hub for undergraduate student activity there are also many graduate students, faculty, tourists, visiting scholars, and other employees who use the library and contribute to its waste stream. Signage should be understandable and relevant as possible to the diverse visitors at YRL. The library may also benefit from engaging educational campaigns before its busiest periods such as midterms season or finals week. During this time, the waste bins often fill up quickly as use of the library increases and busy students bring snacks, take-out, and store-bought caffeinated beverages to the library. Various engagement tactics such as contests, displays, and tabling could help educate a large number of library users on proper disposal and alternatives to single-use items.

It has also been made evident from the waste audits conducted in the library that Cafe 451 is a consistent and large contributor to the waste stream. For this reason, we recommend that there be more focused efforts on transitioning the cafe to zero-waste. The cafe staff, including baristas, should be trained and equipped with the tools to properly compost and recycle. In our previous audits, compostable and recyclable materials such as coffee grounds and creamer containers were found in the landfill. Education on proper disposal and adequate recycling and compost bins could allow the cafe to increase its waste diversion. On the other hand, Cafe 451 should also play a role in educating its own customers on waste disposal. While their coffee cups are compostable, often times the cups are found in the wrong bins. Similarly, the cafe could implement a fee for single-use cups or simply educate and encourage people to use reusable coffee mugs.

Lastly, the Zero Waste Team would recommend further altering the bins in the library. Bins still need to be placed in the higher floors of the buildings, feedback from librarians who have witnessed the bins overflow during busy periods have revealed a possible need for larger bins, and centralization of colors and design throughout the campus all would likely aid in waste diversion.

## Appendix A

First Waste Audit: February 20, 2019



The Zero Waste Team sorting landfill waste into the proper waste stream (landfill, recycle, and compost).



Recyclable waste generated by Cafe 451.



All 500 pounds of waste sorted by waste streams: tan for landfill, blue for recyclables, and green for compost.



The Zero Waste Team showing off our efforts.

## Appendix B

### Campaigns: Tri-Waste Bin Implementation and Tabling Sessions



The Team creating a map of proposed locations for the new tri-waste bins. This map was then used as a guide when the bins were installed.



The new tri-waste bins that we helped to install in YRL. The tri-waste bins have compost, recycle, and landfill streams.



New high-volume compost and recycle bins installed in Young Research Library. We decided to install these in addition to the tri-waste bins after getting feedback that the tri-waste bins were slightly too small for the high volumes of waste generated in YRL.



Compost	Recycle	Landfill
<ul style="list-style-type: none"> <li>Food</li> <li>Soiled Paper</li> <li>Green-Ware</li> </ul>	<ul style="list-style-type: none"> <li>Paper</li> <li>Clean Cardboard</li> <li>Hard Plastic</li> <li>Metal</li> <li>Glass</li> </ul>	<ul style="list-style-type: none"> <li>Snack Wrappers</li> <li>Styro-foam</li> <li>Soiled Plastic</li> </ul>

Two interactive aspects of our tabling sessions. Shown on the left is a waste sorting game, and on the right is an educational waste sorting flyer which we handed out to passersby.



The Zero Waste Team at two of our tabling sessions in front of Young Research Library.

## Appendix C

Second Waste Audit: May 23, 2019



Brand-new printer cartridges recovered from the waste going to landfill.



A glimpse into the waste going to compost. Almost all the items in this bag are indeed compostable, which shows that library users are correctly sorting their waste.



The Zero Waste Team and waste audit volunteers sorting waste generated by YRL.



Our team's disappointment at again finding recyclable and compostable waste from Cafe

451.



All 295 pounds of waste sorted by waste streams: tan for landfill, blue for recyclables, and green for compost.