UBC OKANAGAN

WASTE AUDIT REPORT: OCTOBER 8TH, 2014

Prepared For: Facilities Management and UBC Okanagan Sustainability Office

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EXECUTIVE SUMMARY

On October 8th, 2014, UBC Okanagan and GreenStep Solutions Inc. partnered to facilitate a waste audit. This year three different waste streams (garbage, recycling, and compost) were assessed from 12 different buildings/areas on campus. The 2014 waste audit marked was the fourth audit that GreenStep had facilitated with UBCO since 2008 and the garbage audit remains the primary focus of the overall audit.

The audit was set up at UBC Okanagan's courtyard at 9:00 am and was facilitated by Derek Mahoney, Allisha Heidt, Andrea Mackintosh, and Lindsay Eason. Three separate areas were designated for the three waste streams, bags were placed on tarps with a-frame signs identifying the building from which they came. The GreenStep team, members from UBC Okanagan staff, and student volunteers dressed in protective equipment audited the garbage for seven hours.

A total of 8,377 L of garbage, 3304 L of recycling, and 54 L of compost was audited, totaling 11,736 L of waste audited.

The Garbage Audit findings concluded that only 15% of the total volume of waste was 'true' garbage, meaning that 85% of the waste had the potential of being diverted from the landfill. The findings of the Recycling Audit deemed 71% of the contents to be recyclable (87% if you include returnable items), and the Compost Audit found 89% of the total volume to 'true' compostable waste.

Figure 1. Garbage audit - Percent of total volume of waste by type

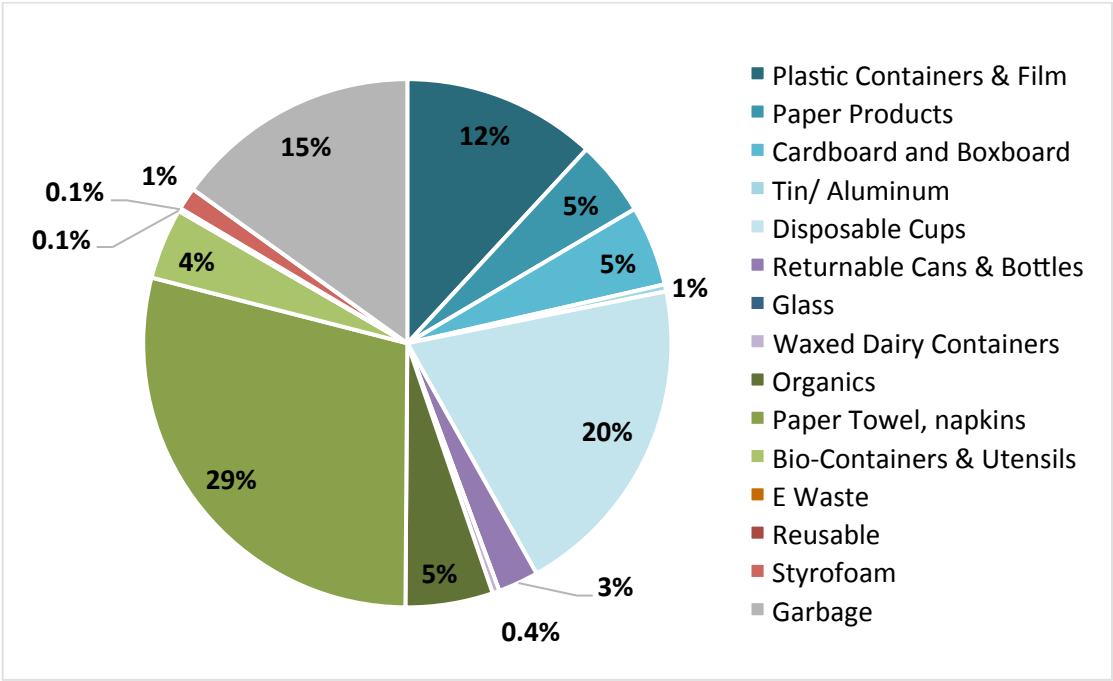


Figure 2. Recycling audit - Percent of total volume of waste by type

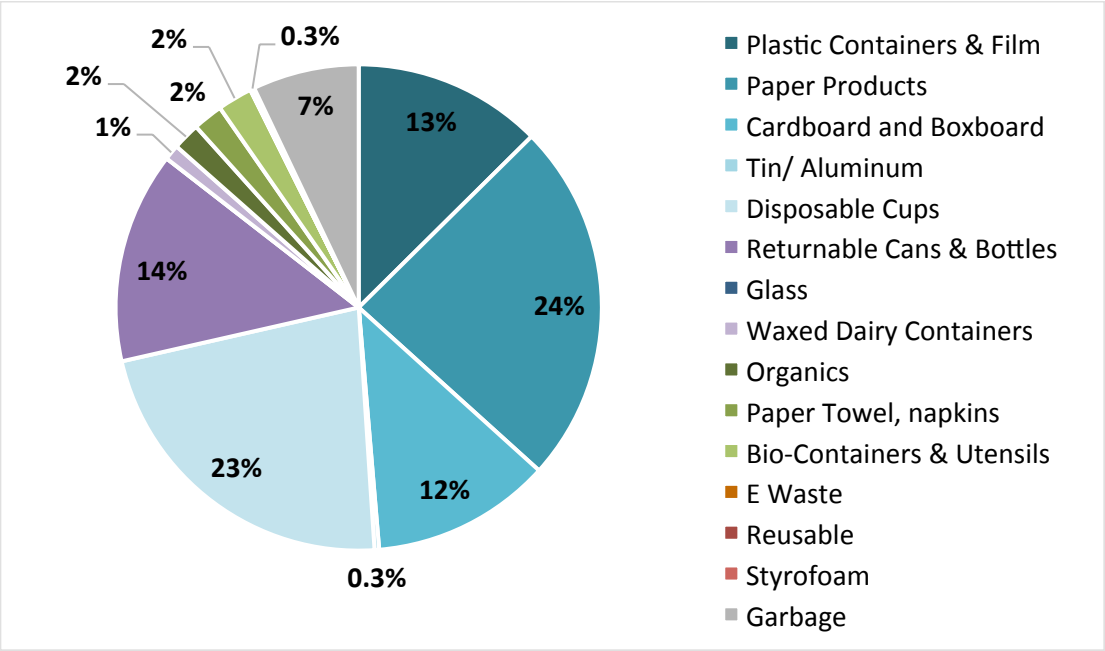
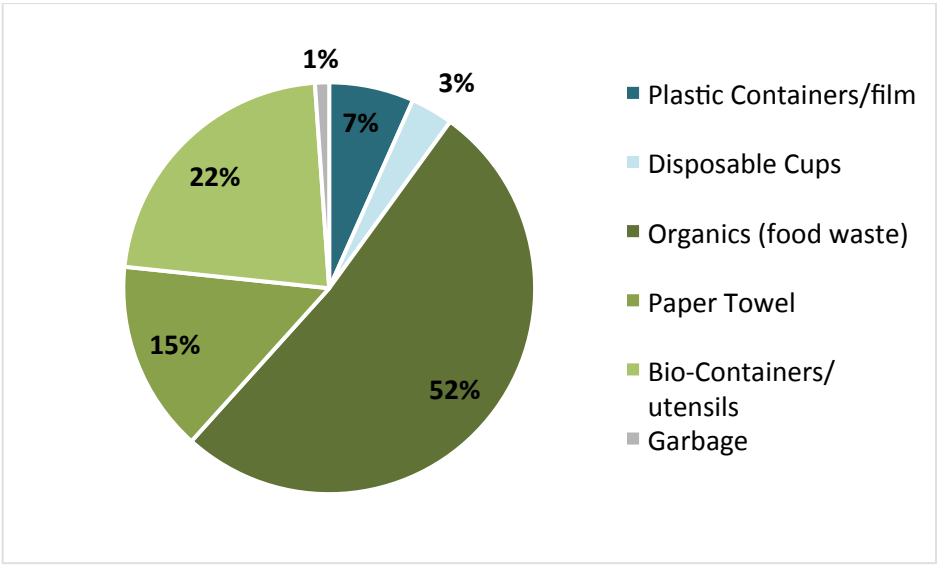


Figure 3. Compost audit - Percent of total volume of waste by type



Key Recommendations include:

GARBAGE AUDIT

- Consistent and improved signs across campus and in residences
- Remove any stand-alone garbage containers and pair them with the multi waste stream receptacles located in across campus
- Consider having a separate containers for disposable cups
- Improved and increased education is needed about recycling disposable cups

RECYCLING AUDIT

- Increased education on recycling disposable cups
- A separate vessel is needed to divert refundable items from the waste stream

COMPOST AUDIT

- Research a composting system that can accommodate organic waste, disposable coffee cups and foodware similar to what is in place at Okanagan College Salmon Arm and Kalamalka Campus

INTRODUCTION

In early September, Facilities Management and the UBC Okanagan Sustainability Office contacted Angela Nagy of GreenStep to assist in facilitating a waste audit on campus. A meeting was set with interested parties on campus including Leanne Bilodeau from the Sustainability Office, Guy Guttman from Housing Operations and Services, and Roger Bizzotto and Derek Mahoney from the Facilities Maintenance Office. A date of October 8th, 2014 was set to audit one day's worth of waste from thirteen different buildings/areas on campus:

- Administration
- Arts
- Arts & Sciences Centre (ASC)
- Courtyard
- Creative & Critical Studies (CCS)
- Engineering, Management & Education (EME)
- Fipke Centre
- Gym
- Library
- Reichwald Health Sciences Centre (RHSC)
- Residences (*Sample)
- Science
- University Centre (UNC)

On the day of the audit, approximately 21 volunteers participated throughout the course of the day. Volunteer participation was generated by the Environment and Sustainability Society, professors, and the Maintenance Department. The cafeteria provided pastries, hot chocolate, water, and coffee.

Allisha Heidt, Andrea Mackintosh, and Lindsay Eason facilitated the event by helping to set up, greeting the volunteers, facilitating a safety orientation, explaining the waste audit categories and procedure, answering questions throughout the audit process, collecting the data, and cleaning up after the audit was complete.

The objectives of the waste audit were to:

- Record the type, volume, and composition of waste generated at UBC Okanagan and break it down by source
- Identify opportunities to improve current waste systems on campus
- Identify buildings to target with additional education
- Raise awareness about waste reduction on campus
- Identify opportunities for improvements and find ways to get students involved

UBC OKANAGAN WASTE REDUCTION PRACTICES

UBC Okanagan has already implemented some waste reduction practices from the recommendations of the three waste audits conducted by GreenStep in the past. To date, UBC Okanagan has completed the following initiatives:

- Implemented a campus-wide composting system
- Removed most single stand-alone garbage bins
- Begun to incorporate compostable utensils and plates in food service areas
- Included compost in the current four-bin waste stations with updated signs

METHODOLOGY

Quantities of waste were estimated using volume rather than weight for two reasons: 1) Waste is picked up and disposed of based on how full the bins are, not by weight. 2) Items like paper, plastic film, and Styrofoam weigh significantly less than other items such as food waste.

Clear and black bags used for the audit were supplied by both GreenStep and UBCO. The volumes of the three types of bags supplied by UBCO were estimated using the bag dimensions given on the box and the conversion chart shown in Figure 1: 42x48= 196 L, and 22x24 = 23 L

Bag Size (in inches)	Approx. Useable Capacity Gallons	Approx. Usable Capacity Litres
17 x 16	1-2	4-8
20 x 22	2-3	8-11
22 x 24	4-6	15-23
24 x 30	9-11	34-42
26 x 36	16-20	60-76
30 x 38	22-26	83-98
35 x 47	33-40	125-151
35 x 50	35-42	132-159
38 x 50	37-45	139-170
42 x 48	45-52	170-196

Usable is deemed as 80-85% capacity, with a portion of the bag being used to close the bag at the top

Figure 1. Bag size estimation chart. Source: http://www.polyethics.com/wp-content/uploads/2012/11/Bag-Gallon-Litre.pdf

Rather than sorting through one entire day's worth of waste for the residence building, a sample was used. For the garbage audit, one bag from Similkameen and one from Kalamalka were audited, totaling 358 L. For the recycling audit, 173 L of recycling was audited from a mixture of residence buildings. Results for the residence audits are presented separately because the sample size relative to the total amount of waste from one day is unknown.

After the audit was complete, the sorted bags were put into piles corresponding to the type of waste so all waste could be appropriately diverted, ie. recycled, composted, returned for refund, or sent to the landfill. Volunteers wore protective coveralls, shoe covers, and nitrile gloves. The use of safety glasses was optional.

All waste was sorted, either physically and/or visually, into the following five categories with 14 sub-categories:

- Recycling
  - Plastic containers/film
  - Paper products
  - Cardboard and boxboard
  - Tin/aluminum
  - Disposable cups
- Returnable
  - Refundable cans/bottles
  - Glass
  - Waxed dairy containers
- Compost
  - Paper towel;/napkins
  - Organics (food/yard waste)
  - Bio-containers/utensils
- Garbage
- Other
  - E-waste
  - Reusable

- Styrofoam

GARBAGE AUDIT

Each bag of garbage was physically sorted into the five main categories by volunteers, then visually sorted into the sub-categories by GreenStep. The only exception was the waste from the library, which was sampled from rather than sorting each bag. Four out of 18 bags were audited, and data was extrapolated to estimate the contents of the unsorted bags by multiplying the volumes in each category by a factor of 4.5.

After the audit was complete, the following data was recorded: waste origin (building), how full the sorted bag was (by percent), the size of bag, and the percentage of each type of waste within the five main categories.

Waste composition results for the Admin building was unfortunately not collected. Based on photos of the audit, the Admin waste was placed outside of the tarped area and may not have been sorted and/or recorded. In 2012 the admin building accounted for only 1% of the total waste audited, so the overall results should not be significantly skewed.

RECYCLING AUDIT

The Recycling Audit was a new component to the traditional waste audits that took place in 2012, 2010, and 2008. Following a similar fashion, one day's worth of recycling was placed on the tarp separated by building origin. A visual audit of the recycling bags was conducted by GreenStep to determine what percent of each bag's composition was 'true recycling' and what percentage was contamination.

COMPOST AUDIT

An audit of the existing compost system was also conducted in tandem with the garbage and recycling audit. The audit was completed on one day's worth of compost originating from inside all buildings for staff and students; this excluded compost produced by food services. UBCO staff estimated that the audited compost accounted for about 10-15% of the total compost produced on campus in one day.

The bags of compost were placed on a separate tarp adjacent to the garbage and recycling audit. The bags were sorted using the same categories as the garbage and recycling audit. This audit was conducted to understand the type of organic waste and what the percentage of contamination, if any, has been entered in to the compost system.

RESULTS

Results of the waste audit are presented below and broken down into the three audits: garbage, recycling, and compost. As discussed previously, residence results are presented separately in each section. A section the end summarizes the results of the garbage and recycling audits combined.

GARBAGE AUDIT

The results indicate that of the 8,020 L of waste audited, 42% was recycling, 3% was returnable, 39% was compost, 1% was Styrofoam, and 15% was actual garbage. Specific details and breakdown on the volumes of waste can be found in the tables and figures below.

Table 1 shows the complete breakdown of the garbage audit, including the volume of waste from each building and in each waste category, the percentages of each category, and totals in litres and percent. *Note: semi-total rows occur within the table for recyclables and compost

Table 1. Garbage Audit- Volume of waste (in litres and %) measured by type of waste for each building/area on campus (UBCO Waste Audit, October 8, 2014)

Type of Waste	Origin of Waste																					
	Arts		ASC		Courtyard		CCS		EME		Fipke		Gym		Library *Calculated from sample		RHSC		Science		UNC		Total	
	%	L	%	L	%	L	%	L	%	L	%	L	%	L	%	L	%	L	%	L	%	L	%	L
Plastic Containers & Film	7%	73	8%	30	14%	112	5%	17	15%	220	15%	127	7%	11	10%	162	7%	12	12%	82	14%	86	12%	932
Paper Products	3%	30	5%	18	5%	39	8%	25	5%	79	6%	49	1%	1	4%	65	4%	7	4%	30	4%	22	5%	365
Cardboard and Boxboard	4%	42	7%	24	6%	44	5%	17	8%	121	5%	43	1%	1	0%	0	0%	0	3%	17	4%	23	5%	333
Tin/ Aluminum	0%	1	3%	12	0%	1	0%	1	0%	1	0%	1	0%	0	2%	32	0%	0	0%	0	1%	5	0%	55
Disposable Cups	34%	338	10%	36	31%	240	8%	25	19%	281	15%	134	7%	11	22%	356	14%	24	16%	107	13%	82	20%	1635
Returnable Cans & Bottles	4%	41	2%	6	3%	21	2%	5	4%	57	1%	5	0%	0	2%	31	1%	1	2%	12	2%	12	2%	192
Glass	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0
Waxed Dairy Containers	1%	7	2%	6	0%	4	0%	1	0%	3	0%	1	0%	0	2%	34	0%	0	0%	0	0%	0	0%	55
Total Recyclables	53%	532	37%	133	59%	460	29%	91	51%	762	41%	361	15%	24	43%	680	25%	45	37%	248	37%	230	45%	3566
Organics	8%	84	3%	9	10%	74	4%	13	4%	56	5%	42	3%	5	6%	87	5%	9	4%	26	4%	24	5%	431
Paper Towel, napkins	24%	237	48%	172	5%	37	36%	110	25%	370	31%	266	53%	87	40%	642	41%	73	37%	249	35%	216	29%	2459
Bio-Containers & Utensils	4%	42	0%	0	6%	46	3%	10	4%	65	4%	38	3%	5	3%	49	8%	14	4%	27	6%	38	4%	333
Total Compostables	36%	363	50%	182	20%	157	43%	133	33%	491	40%	346	59%	97	49%	778	54%	96	45%	303	45%	278	39%	3223
E Waste	0%	2	0%	0	0%	1	0%	0	0%	1	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	4
Reusable	0%	2	0%	0	0%	0	0%	0	0%	1	0%	0	4%	6	0%	0	0%	0	0%	0	0%	0	0%	9
Styrofoam	0%	2	3%	12	3%	23	3%	10	1%	16	1%	6	0%	0	0%	0	3%	6	1%	6	2%	12	1%	93
Garbage	10%	97	10%	36	17%	133	24%	75	14%	212	18%	157	22%	36	8%	130	17%	30	18%	121	16%	97	15%	1124
Total Waste Volume	12%	998	5%	363	10%	774	4%	309	18%	1483	11%	870	2%	163	20%	1588	2%	177	8%	678	8%	617	100%	8020

The percentage of waste identified within each category is represented in Figure 2.

Figure 2. Garbage audit - Percent of total volume of waste by type for each building/area on campus (UBCO waste audit, October 8, 2014)

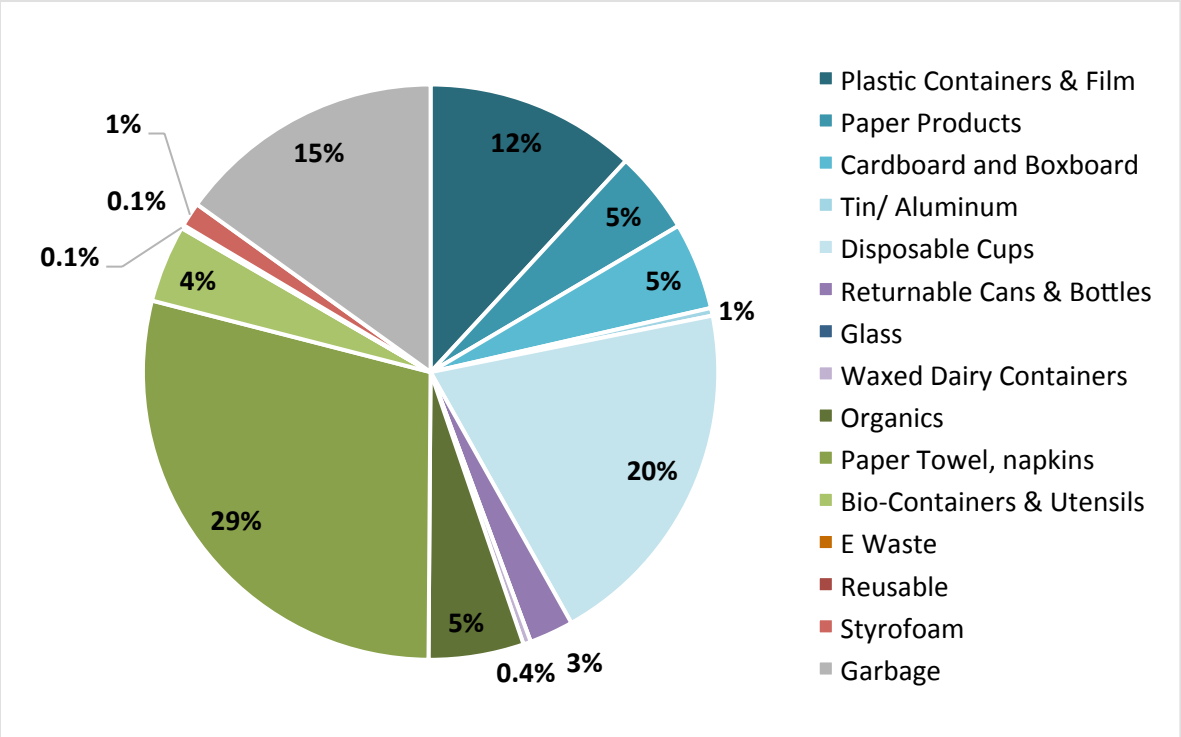


Figure 3 and Table 2 below show the volume of waste collected from each building. The areas that produced the largest quantities of waste were the Library and EME buildings.

Figure 3. Garbage Audit - Percent of total volume of waste by source (UBCO waste audit, October 8, 2014)

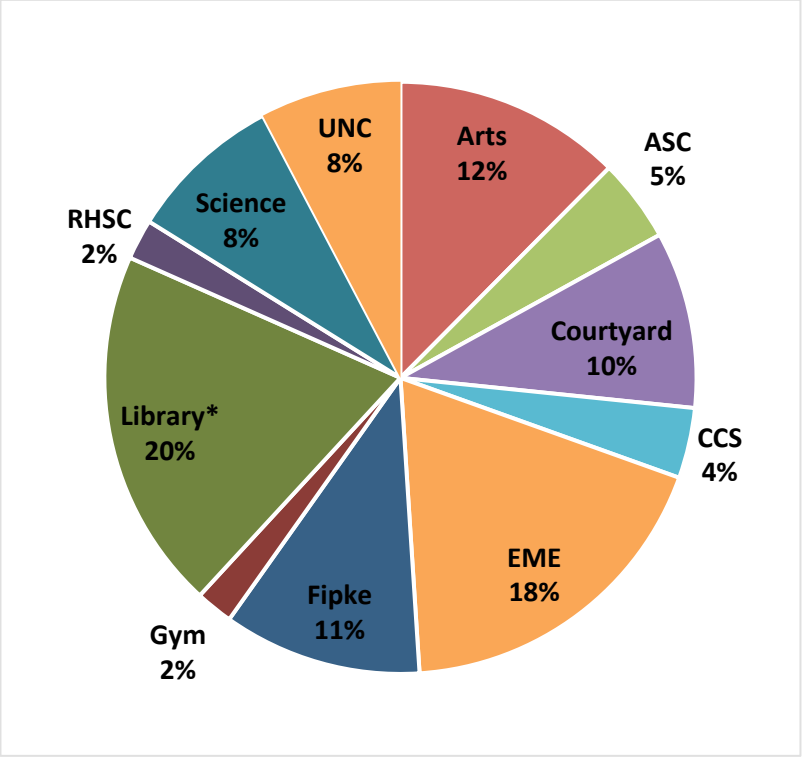


Table 2. Garbage Audit – Percent of total volume of waste by source, in descending order (UBCO waste audit, October 8, 2014)

Source	Percent of total waste
Library	20%
EME	18%
Arts	12%
Fipke	11%
Courtyard	10%
Science	8%
UNC	8%
ASC	5%
CCS	4%
RHSC	2%
Gym	2%
Total	**100%**

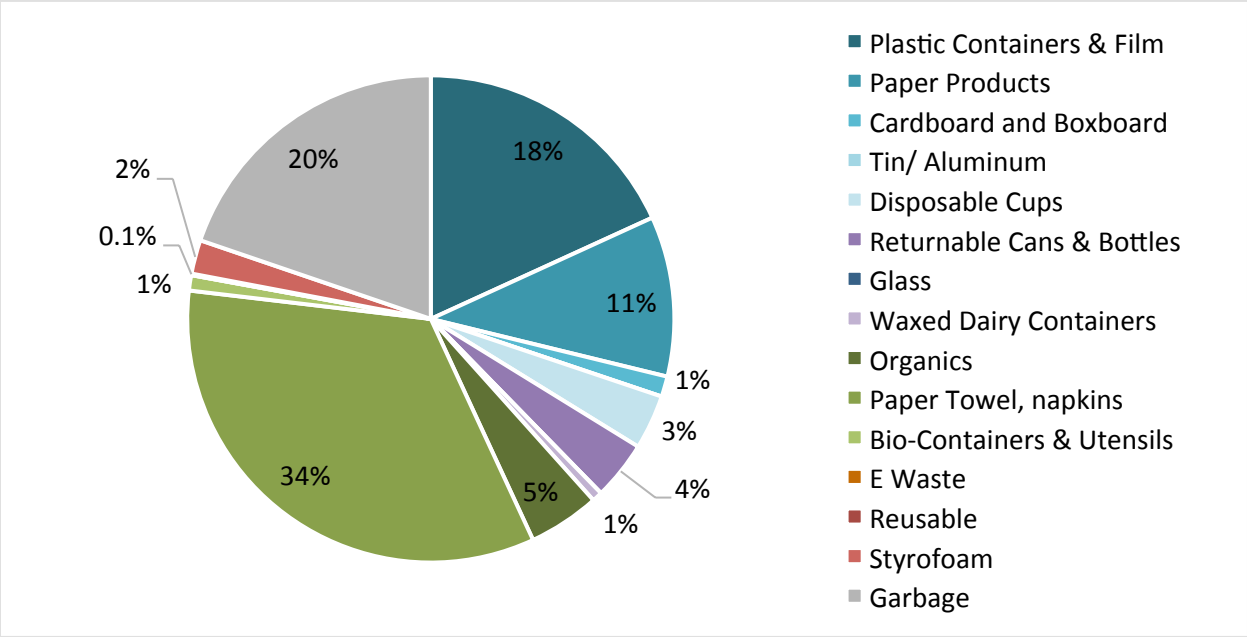
GARBAGE AUDIT - RESIDENCE

Table 3 and Figure 4 below show the results of the garbage audit completed on the sample from residence, which was 358 L. Thirteen bags were brought to the audit site as a sample from several residence buildings on campus. Two bags were audited (one from Similkameen, and one from Kalamalka). The sample contained 34% recycling, 5% returnables, 40% compost, 20% garbage, and 2% Styrofoam

Table 3. Garbage audit - Volume of waste (in Litres and %) measured by type of waste for residence sample (UBCO Waste Audit, October 8, 2014)

Type of Waste	Origin	
	Residence (Sample)	
	%	L
Plastic Containers & Film	18%	65
Paper Products	11%	38
Cardboard and Boxboard	1%	5
Tin/ Aluminum	0%	0
Disposable Cups	4%	13
Returnable Cans & Bottles	4%	14
Glass	0%	0
Waxed Dairy Containers	1%	2
Total Recyclables	38%	137
Organics	5%	17
Paper Towel, napkins	34%	121
Bio-Containers & Utensils	1%	4
Total Compostables	40%	141
E Waste	0%	0
Reusable	0%	0
Styrofoam	2%	8
Garbage	20%	71
Total Waste Volume	**100%**	**358**

Figure 4. Garbage audit - Percent of total volume of waste by type for residence (UBCO waste audit, October 8, 2014)



RECYCLING AUDIT

The results of the recycling audit indicate that of the 3,131 L of waste audited, 71% was recyclable, 15% was returnable, 6% was compost, and 7% was garbage. Specific details and breakdown on the volumes of waste can be found in the tables and figures below.

Table 4 shows the complete breakdown of the recycling audit, including the volume of waste from each building and in each waste category, the percentages of each category, and totals in litres and percent. There was no recycling collected form the RHSC building. *Note: semi-total rows occur within the table for recyclables and compost

Table 4. Recycling Audit- Volume of waste (in Litres and %) measured by type of waste for each building/area on campus (UBCO Waste Audit, October 8, 2014)

Type of Waste	Origin of Waste																					
	Admin		Arts		ASC		Courtyard		CCS		EME		Fipke		Gym		Library		Science		UNC		Total	
	%	L	%	L	%	L	%	L	%	L	%	L	%	L	%	L	%	L	%	L	%	L	%	L
Plastic Containers & Film	0%	0	20	68	10%	26	12%	35	23%	35	10%	49	16%	32	75%	74	5%	26	8%	28	9%	22	**13%**	**394**
Paper Products	64%	141	6	19	53%	136	6%	16	28%	44	15%	74	21%	42	15%	15	13%	65	40%	134	30%	69	**24%**	**755**
Cardboard and Boxboard	19%	41	3	11	24%	61	5%	14	23%	35	20%	101	1%	1	0%	0	1%	5	24%	79	11%	26	**12%**	**374**
Tin/ Aluminum	0%	0	0	0	1%	3	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	1%	2	2%	4	**0%**	**10**
Disposable Cups	11%	24	20	70	4%	10	37%	104	14%	21	24%	116	38%	75	10%	10	41%	212	10%	33	13%	29	**22%**	**704**
Returnable Cans & Bottles	0%	0	10	36	0%	0	23%	66	5%	7	10%	49	7%	14	0%	0	36%	189	10%	32	21%	48	**14%**	**440**
Glass	0%	0	0	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	**0%**	**0**
Waxed Dairy Containers	0%	0	0	0	2%	6	3%	8	0%	0	2%	10	1%	1	0%	0	1%	5	0%	1	0%	0	**1%**	**32**
Total Recyclables	93%	206	59	204	94%	243	85%	243	91%	143	81%	399	85%	165	100%	98	97%	502	94%	310	86%	197	**87%**	**2709**
Organics	0%	5	8	28	0%	0	3%	9	0%	0	1%	7	2%	4	0%	0	0%	1	0%	1	0%	1	**2%**	**57**
Paper Towel, napkins	2%	5	6	19	4%	9	1%	2	6%	10	1%	4	1%	3	0%	0	0%	0	1%	4	3%	6	**2%**	**62**
Bio-Containers & Utensils	0%	0	0	43	0%	0	0%	4	0%	0	0%	8	0%	3	0%	0	0%	0	0%	3	0%	12	**2%**	**72**
Total Compostables	4%	10	26	90	4%	9	6%	16	6%	10	4%	18	5%	10	0%	0	0%	1	3%	9	8%	19	**6%**	**192**
E Waste	0%	0	0	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	1	0%	0	**0%**	**1**
Reusable	0%	0	0	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	**0%**	**0**
Styrofoam	0%	0	0	0	0%	0	1%	2	0%	0	0%	0	0%	0	0%	0	1%	4	1%	2	0%	0	**0%**	**8**
Garbage	2%	5	15	52	2%	6	8%	24	3%	4	15%	76	10%	19	0%	0	2%	12	3%	9	6%	14	**7%**	**222**
Total Waste Volume	7%	220	11.1%	346	8%	258	9%	284	5%	157	16%	493	6%	194	3%	98	17%	518	11%	331	7%	230	**100%**	**3131**

The percentage of waste identified within each category is represented in Figure 5.

Figure 5. Recycling audit - Percent of total volume of waste by type for each building/area on campus (UBCO waste audit, October 8, 2014)

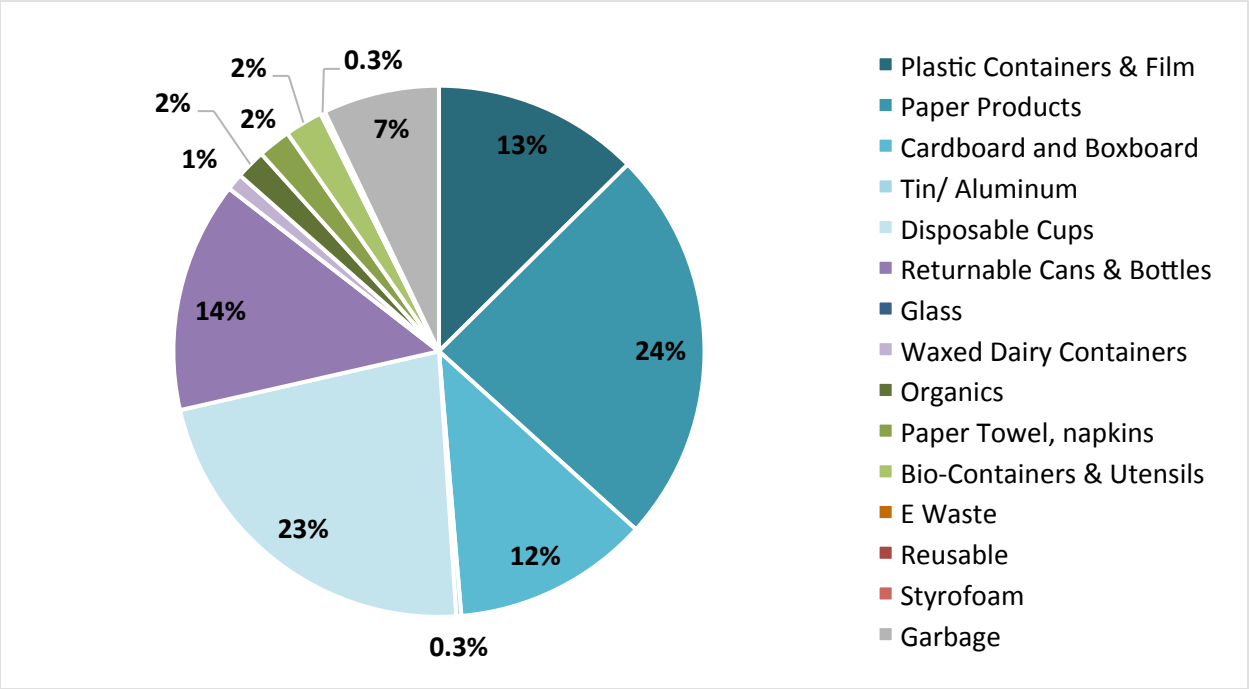


Figure 6 and Table 5 below show the volume of waste collected from each building. The areas that produced the largest quantities of waste were the Library and EME buildings.

Figure 6. Recycling Audit - Percent of total volume of waste by source (UBCO waste audit, October 8, 2014)

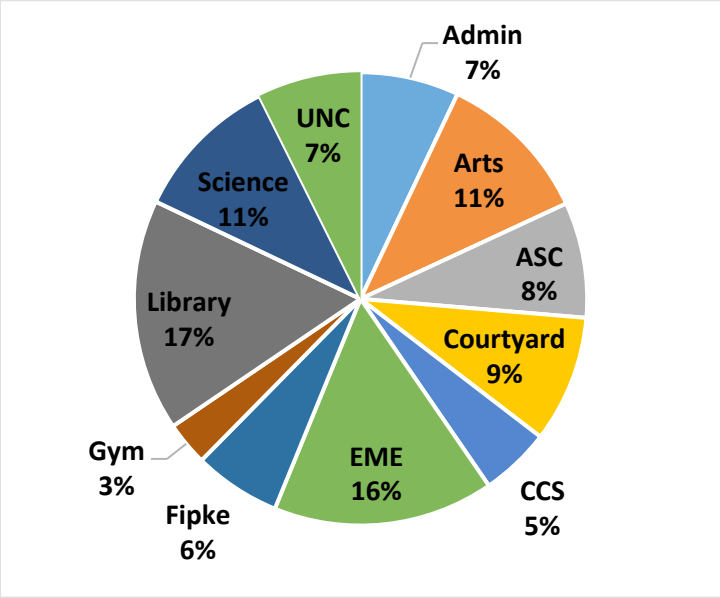


Table 5. Recycling Audit – Percent of total volume of waste by source, in descending order (UBCO waste audit, October 8, 2014)

Source	Percent of total waste
Library	17%
EME	16%
Arts	11%
Science	11%
Courtyard	9%
ASC	8%
UNC	7%
Admin	7%
Fipke	6%
CCS	5%
Gym	3%
Total	**100%**

RECYCLING AUDIT - RESIDENCE

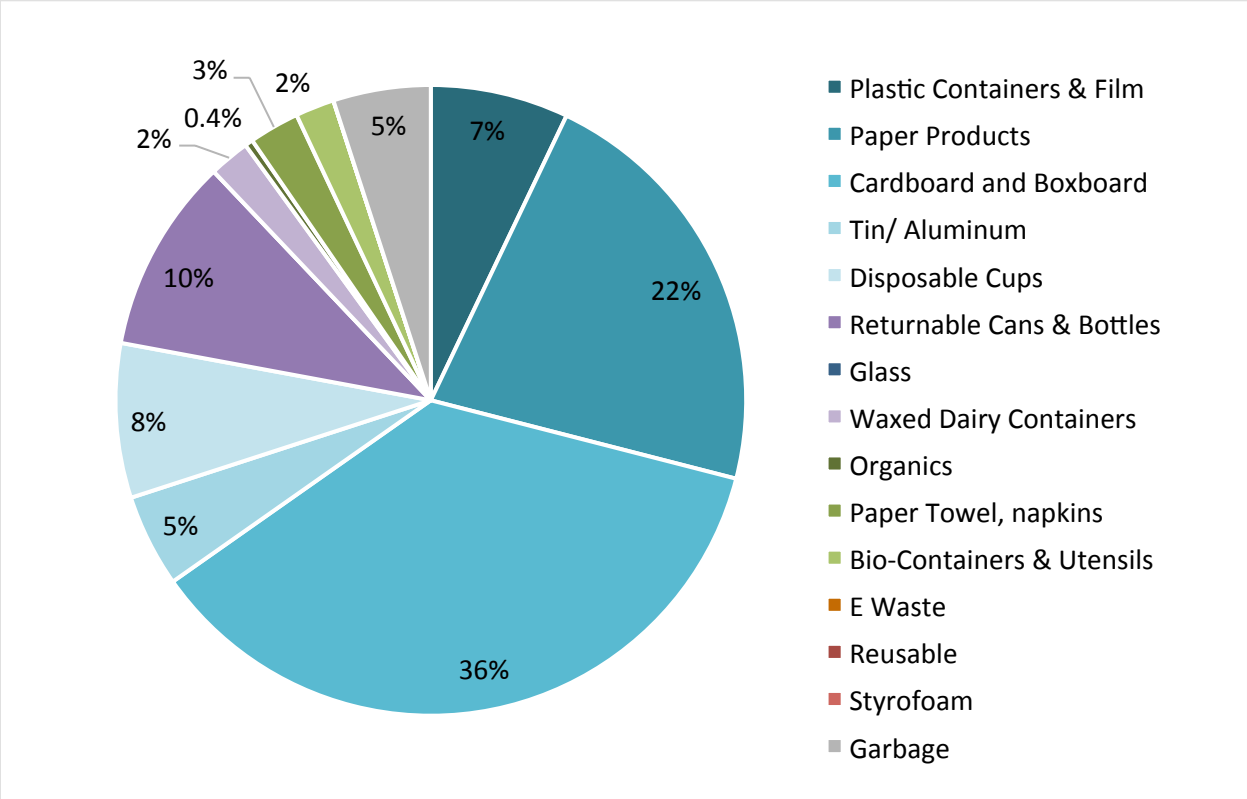
Table 6 and Figure 7 below show the results of the recycling audit completed on the sample from residence, which was 173 L. The sample contained 78% recycling, 12% returnables, 5% compost, and 5% garbage.

Table 6. Recycling audit - Volume of waste (in Litres and %) measured by type of waste for residence sample (UBCO Waste Audit, October 8, 2014)

Type of Waste	Origin	
	Residence (Sample)	
	%	L
Plastic Containers & Film	7%	12
Paper Products	22%	38
Cardboard and Boxboard	36%	63
Tin/ Aluminum	5%	8
Disposable Cups	8%	14
Returnable Cans & Bottles	10%	17
Glass	0%	0
Waxed Dairy Containers	2%	4
Total Recyclables	90%	156
Organics	0%	1
Paper Towel, napkins	3%	4
Bio-Containers & Utensils	2%	3
Total Compostables	5%	9
E Waste	0%	0
Reusable	0%	0
Styrofoam	0%	0
Garbage	5%	9

Total Waste Volume	**100%**	**173**

Figure 7. Recycling audit - Percent of total volume of waste by type for residence sample (UBCO waste audit, October 8, 2014)



COMPOST AUDIT

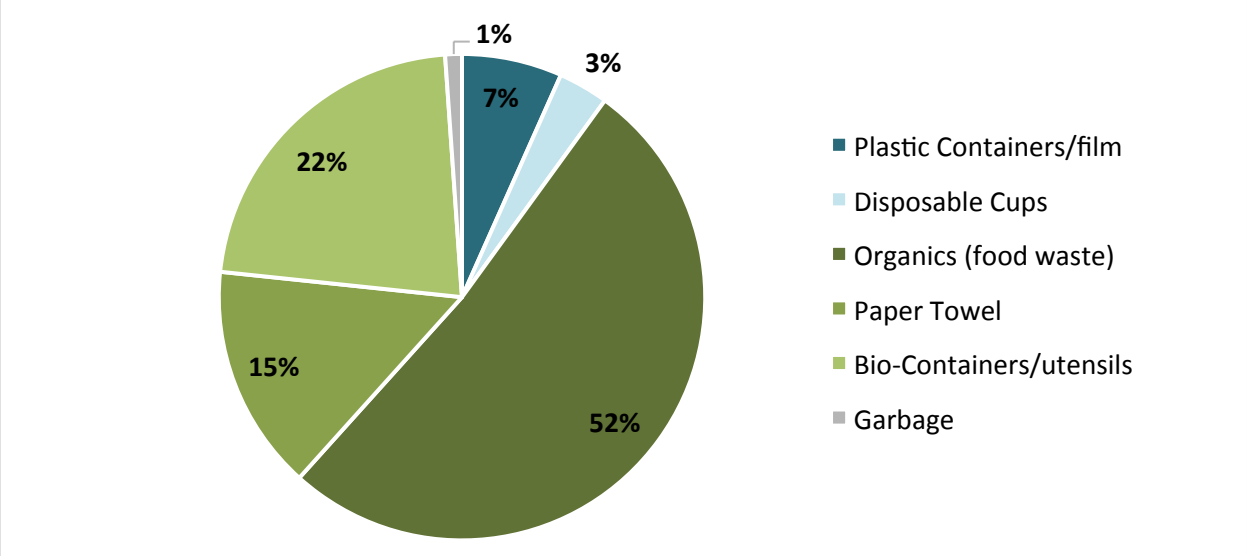
The results of the compost audit indicate that of the 836 L of compost waste audited, 89% was compost, 10% was recycling, and 1% was garbage. Specific details and breakdown on the volumes of waste can be found in Table 7 and Figure 8 below.

For the purpose of this audit, paper towel was included in the compost category, even though it is not currently included in the composting program at UBCO.

Table 7. Compost Audit - Volume of waste (in Litres and %) measured by type of waste (UBCO Waste Audit, October 8, 2014)

Type of Waste	Volume (L)	%
Plastic Containers/film	3.6	7
Disposable Cups	1.8	3
Organics (food waste)	28.1	52
Paper Towel	8.2	15
Bio-Containers/utensils	12.1	22
Garbage	0.6	1
Totals	**54.5**	**100**

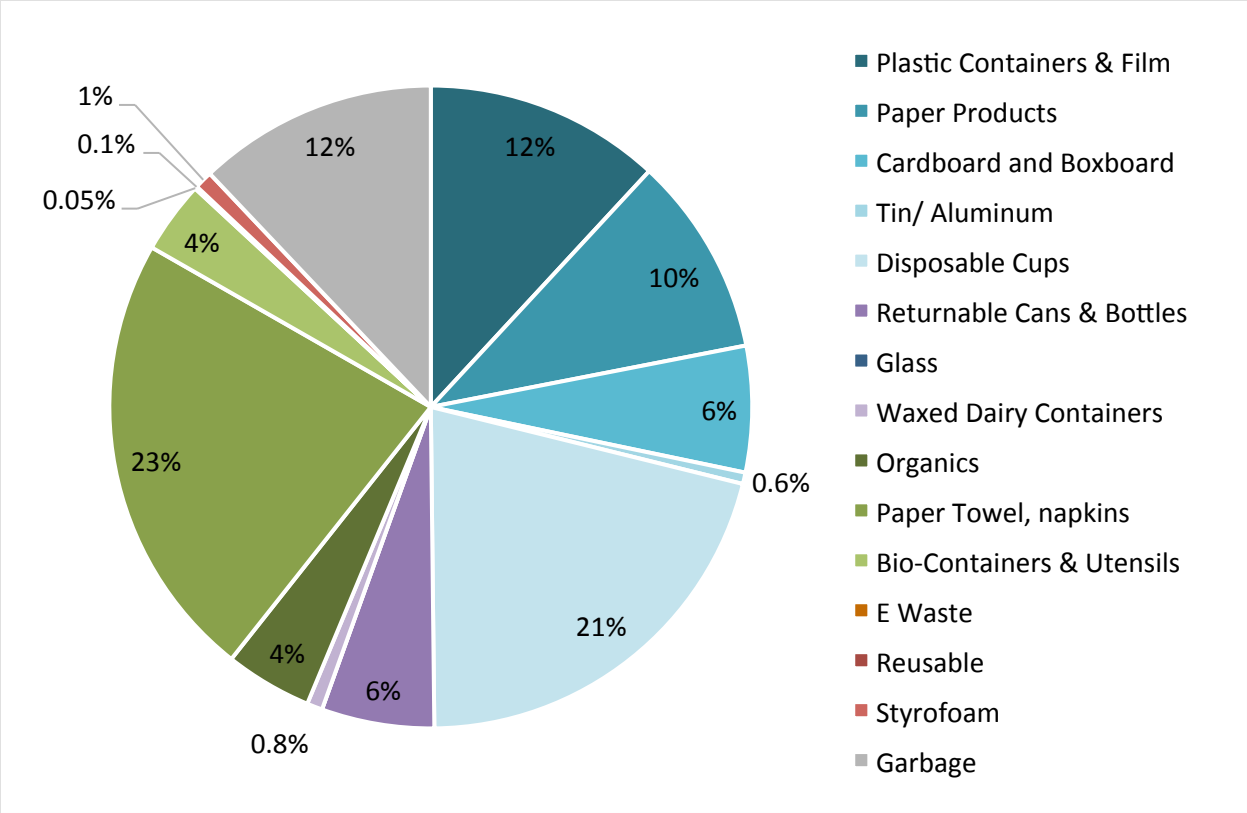
Figure 8. Compost audit - Percent of total volume of waste by type (UBCO waste audit, October 8, 2014)



GARBAGE AND RECYCLING AUDITS

Figure 9 below shows the results from the garbage and recycling audits combined, giving an indication of the overall composition of waste created at UBCO.

Figure 9. Compost audit - Percent of total volume of waste by type (UBCO waste audit, October 8, 2014)



OBSERVATIONS BY TYPE OF WASTE

The observations presented in this section are focused on the garbage audit results only.

RECYCLING

Of all the garbage bags collected, recycling accounted for 42% of the waste. For the purpose of this audit and report, recycling is defined as those items which are accepted in the blue bin (plastic containers/film, paper products, cardboard/boxboard, tin/aluminum, and disposable paper cups).

Of the 42% in recyclable materials, the largest sub-category was disposable cups (20%), followed by plastic containers and film (12%), and paper products and cardboard/boxboard each totaling 5% in their respective categories.

The biggest sources of recyclable items (by percent of total waste) were the Courtyard (56%), Arts (48%), and EME (47%).

In 2012, 58% of the total waste audited was comprised of recyclable materials. This indicates a 16% reduction due to improved efforts on campus. One key item that was noticed was lids from disposable cups. Placing signage that educates students and staff that the lids are recyclable may help for further diversion.

RETURNABLES

Returnables accounted for 3% of the waste audited. This included refundable bottles and cans (2.5%), and waxed dairy containers (0.4%). The biggest sources of returnable items (by percent of total waste) were Arts (5%), EME (4%), and Library (4%).

COMPOST

Approximately 39% of the total waste audited was compostable. This included paper towel and napkins (29%), organic food and yard waste (5%) and bio-containers and utensils (4%). This percentage has increased by 15% compared to the 2012 waste audit results (24% of total waste).

The buildings with the largest contribution of compost (by percent of total waste) were the Gym (59%), RHSC (54%), and ASC (50%).

GARBAGE

Garbage accounted for approximately 15% of the waste audited. The smallest sources of garbage (by percent of total waste) were the Library (8%), Arts (10%), and ASC (10%).

OTHER

Other divertible items accounted for 1.6% of the waste audited. This included Styrofoam (1.4%), Reusable items (0.1%), and E-Waste (0.1%). The largest sources of other divertible items (by percent of total waste) were the Gym (4%), RHSC (3%), and ASC (3%).

YEAR OVER YEAR COMPARISON BETWEEN 2008, 2010, 2012 AND 2014

The four figures and tables below show comparisons in garbage audit results from 2008 to 2014.

Figure 10. Comparison of waste sample size (Volume in Litres). Does not include residence sample for 2014 audit. (UBCO Waste Audit, October 8, 2014)

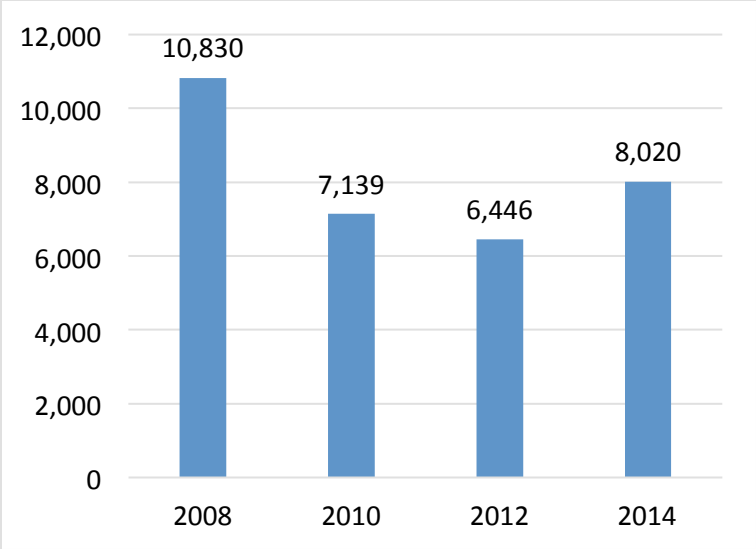


Figure 11. Comparison of percent of total volume for each waste category from 2008 to 2014 (UBCO Waste Audit, October 8, 2014)

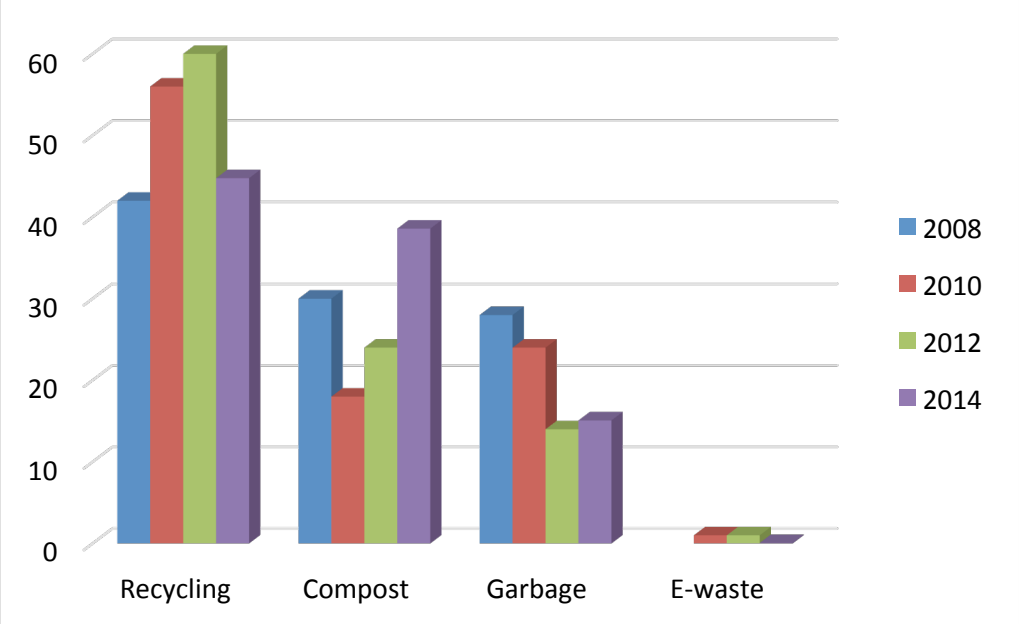


Table 8. Year over year comparison of percent of total volume of waste by source (UBCO waste audit, October 8, 2014)

Source Building	Year			
	2008	2010	2012	2014
Admin	18%	1%	1%	
Arts	20%	25%	11%	12%
ASC		3%	7%	5%
CCS	6%	6%	4%	4%
Courtyard				10%
EME			12%	18%
Fipke	6%	6%	6%	11%
Gym	28%	1%	2%	2%
Library	12%	18%	10%	20%
Offices		38%	35%	
RHSC			1%	2%
Science	10%	3%	8%	8%
UNC			4%	8%

Table 9. Year over year comparison of percent of total volume of waste by type (UBCO waste audit, October 8, 2014)

Volume of Waste by Type (%)	2008	2010	2012	2014	Change (2012 to 2014)
Plastic	18	15	24	12	Better, needs improvement
Paper	13	12	8	5	Better
Cardboard/ Boxboard	6	2	2	5	Worse
Tin/ Aluminum	0.0	2.0	0.2	0.4	Static (trace found in garbage)
Disposable Cups	14	25	24	20	Better, needs improvement
Bottles/Cans	4	0	3	2	Better
Glass	0.3	0.0	0.0	0.0	Static (trace found in garbage)
Waxed Dairy Containers		0.0	0.3	0.4	Static (trace found in garbage)
Wet Organics	10	13	6	5	Better
Paper Towel/Bioware	21	5	18	33	Worse, needs improvement
E-Waste		1.0	0.7	0.1	Better
Styrofoam	3.6	1.0	2.0	1.4	Better
Reusable				0.1	Baseline Set
Garbage	11	23	13	15	Needs improvement*

*The low number in the case of garbage indicates a need for improvement because the goal is to have 100% garbage in the garbage audit. An overall improvement would be more actual garbage and less of everything else.

RECOMMENDATIONS FOR IMPROVEMENT

The following recommendations are to help guide improvements in the collection and disposal of recyclable, returnable, compostable, and hazardous waste material. Each section is aimed at creating programs, policies, or pilot projects to reduce waste heading to the landfill. Education and communication are a key component to the success of every recommendation.

REDUCING AND REUSING

- Connect with the major food services suppliers (GFS, Sysco) and ask them to provide food with reduced packaging. Bulk items or larger shipments on dry goods can substantially reduce the amount of cardboard/boxboard that is being produced.
- Start an anti-disposable coffee cup campaign to reduce the amount being consumed and disposed of on campus. This could include a cost savings incentive at each coffee outlet for students who bring their own mug, or could be a campus-wide reusable mug program where a deposit is paid and mugs can be dropped off and picked up at students' convenience to avoid carrying them around all day and washing it themselves. Student surveys will be needed to properly assess the readiness and feasibility of implementing such a program.
- Provide students with reusable water bottles, coffee mugs, and food containers to encourage them to avoid disposable items. Work with the Student Union and make it a campus-wide campaign. Student Union Federations give away all sorts of promotional materials for this very purpose.
- Distribute reusable food containers that students can bring into food services on campus and receive a discount.
- Garner support from food service establishments on campus and encourage them to provide discounts or incentives for students and facility that bring their own mug, cutlery, or food containers to pick up food or coffee. Ensure this is properly advertised.
- Create a campus-wide policy to eliminate single serving items such as creamers, sugar packets, plastic stir sticks, ketchup, mustard, butter, and any other single serving items.
- Create and implement a Zero Waste Policy to eliminate disposable products during meetings and conferences. Only reusable items can be used such as coffee urns, water jugs, reusable coffee cups, and water glasses. Research policies at other universities/organizations.

RECYCLING

- Display clear and consistent waste stations with at least three compartments (recycling, garbage, and composting). Place these waste stations at strategic locations such as high traffic areas in buildings, common areas, and outdoor areas. Easy to understand signage indicating what can go in each bin is extremely important and should follow the signs already created for these stations with some additions. People will do the right thing as long as it is conveniently located and easy to understand.
- The Library was identified as a high problem area. Approximately 92% of the garbage audited from this building had the potential to be diverted from the landfill. Re-evaluate the placement of waste stations and the signage being used.
- Ensure there are no stand-alone garbage cans on campus, as this encourages people to dispose of their waste because of its convenience. A recycling container, at minimum, should accompany every single garbage can on campus.

- Create a separate container for refundable items in support of a year-round campus-wide bottle drive where students and staff can donate their refundable bottles towards a college group, charity, or other good cause.
- Work with your waste hauler company and the RDCO Waste Reduction Office to get the most up to date information on what is recyclable and where items should be placed. Make the recycling directory available to all students through the website and at an on campus waste reduction depot.

COMPOSTING

- Since UBCO is not able to compost foodware items (utensils, plates, coffee cups) and paper towels, consider the purchase of another Earth Tub that collects and composts only foodware related items. Okanagan College (Graham Kershaw) has compost dumpster bins where all items including organic matter, paper towels, and compostable foodware is all placed in the same bin.
- The composition of the compost audit was approximately 89% compostable items, however some contamination was still evident. Consider simple, easy to understand signage so that students and staff understand what can and cannot be disposed of in the compost bins.
- Currently students are placing compostable foodware items into the compost bin because they are unaware that the Earth Tub cannot process these items. Capture these items in a separate labeled container and provide signage that educates student about why the foodware cannot enter the campus composting system. Our conversations with students have led us to believe that they do not understand what is compostable and what is not.
- Implement Green Champions to take responsibility of office compost bins. This should be embedded into the stewardship component of a position's job description. This way if there is employee turnover, the responsibility for the compost remains within the job.

E-WASTE

- Ensure that an electronic waste bin is placed in all buildings, especially the library.
- Have a departmental drop of area for all E-waste. Have the janitorial staff take out and leave E-waste behind with a note if and when it is detected. Set up a biweekly collection of E-waste from each area on campus.

EDUCATION AND COMMUNICATION

- Make policies online easy to locate on website and in high waste generating areas (ie. Library, EME, Arts)
- Display clear and consistent signs around campus about what is and is not recyclable, compostable, and garbage.
- Work with the Student Union and other clubs on campus. The results of this waste audit in conjunction with effective signage and presentations can help generate a buzz about the need for better waste diversion practices and help motivate students to choose wisely.
- Engage sustainability champions, likely the Sustainability Coordinator or Green Team leader, to lead the implementation strategy and oversee the measurement and monitoring of the success of each recommended action.
- Organize a recycle, reduce, and reuse flash mob where students can creatively express and educate the importance of reducing waste on campus in a fun and creative way. Work with the Student Union or other creative groups on campus.

PARTICIPATION

- Involve more staff and teachers
- Connect with sororities and fraternities to garner volunteers
- Have a booth at the Volunteer Fair at the beginning of the year. This is something GreenStep could spearhead.

RESIDENCES

- Conduct a Residence only audit in the alternative year to the campus audit.
- With UBCO residences attracting students from all over the world, it is essential that waste policies, rules, and regulations be simply and effectively communicated during the start of the school year. This should be done during the first week of school during campus orientation.
- Signage about what can and cannot be recycled, composted, and placed in the garbage should be consistent to what is located on campus.
- Compost bins should be placed in in rooms/common space with kitchens. Creating a system where students can empty their bin into a larger outside compost or where the bins are picked up would be a great way to divert waste. This compost could be directed to the campus Learning Garden or simply placed into the Earth Tub.

NEXT STEPS: EDUCATION AND IMPLEMENTATION

- **UBCO's current Climate Action Plan on Recycling and Waste** should present the findings of 2008-2014 waste audits. Link to Facilities website where some graphs and charts exist. State clear goals, timelines, and action plans on how the campus aspires to be a 'Zero Waste' campus. What are the opportunities available for students and employees to help the campus reach these goals?
- **Create a Green Team or identify a Green Champion** within all campus departments. Sustainability and green practices should be woven into the fabric of all UBCO's departments. Consider embedding Green Team leadership into the job description of one or two staff members in each department. This will ensure that even if employee turnover occurs, the culture and responsibility of sustainability will remain.
- **Connect with students and staff** to determine what they think is important, effective, and efficient in terms of waste management on campus. This would be especially effective for residences and the library. An end of year survey can help identify what challenges and barriers exist for students to properly divert their waste from the garbage bins. ("Wave part of your end of year library fees is you fill out this survey") This information can be used to improve existing systems and help create policies to support UBCO's long-term sustainability goals.
- **Create a communication strategy** to ensure the entire campus is aware of UBCO's Climate Action Plan. Education is the basis of a successful strategy.

- **Internal Communications can include:** holding educational seminars for key staff and faculty to convey information to students and staff members; setting up a webpage through the Sustainability Office that is regularly updated with new recycling information; put up posters with the website around campus and include the website and a phone number of the waste station signs to direct people to where they can find more information; hold a kickoff event to education students about successes or changes; have a group of volunteers visit all classrooms to convey the message of the new programs and policies; send out emails, memos and put up posters with the new actions; or develop a challenge between faculties or buildings to see which can reduce their waste the most.
- **External Communications can include:** issuing press releases, showcasing programs and successes in common areas for campus visitors to view

- **Launch each new initiative with the help of the communications strategy. Start with clear, consistent signs and waste stations** around the entire campus and remove all old systems and stand-alone garbage cans. Let everyone know how these stations work and what is to go in each bin. If budget is an issue, make the phase in process known so staff and faculty can get used to the idea and will know when certain buildings will be getting their waste stations.
- **Measure, monitor, review, and expand programs as needed.** Create indicators and measures to track progress. Increased metrics should focus on cost of disposal, volume of compost, and increased in student/staff population. Continually refer back to the action plan, timeline, and budget as well as the communications strategy to stay on track, or make adjustments as necessary. Talk with staff, students, and those involved in collection and disposal of waste materials to see where new improvements can be made.
- **Continue to facilitate a waste audit every two years** in order to keep tracking your progress towards zero waste (Next waste audit: October 2016)

CONCLUSION

UBC Okanagan has shown only a slight improvement in waste diversion in comparison to the results of the 2012 Waste Audit. In order for sustainability practices to be successful, the concept and practices need to be integrated into every aspect of campus life in a clear and easy to understand manner.

Despite the low rate of improvement, it is clear that UBC Okanagan has made some large scale improvements to their waste systems including campus-wide composting bins and the removal of many stand alone garbage bins. It seems now that the barrier is around education. A low cost/no cost simple initiative is to display signs that not only *direct* staff and students what to do but also *educate* them and raise their *awareness* about the role they play in achieving local and global sustainability. This motivates and encourages staff and students to make the correct choices and also understand why they are doing what they do.

The data collected from the waste audit clearly shows a need to divert organic waste to a local or on-campus composting facility. Paper towels and disposable paper coffee cups are two largest contributors within the waste streams. The first step would be to focus on opportunities to divert these two items by re-evaluating the effectiveness of the current compost system. Other systems can compost both of these items in addition to other organic wastes.

Evaluate which of these recommendations are within the scope of UBC Okanagan's financial and human resources and use these as opportunities to showcase UBCO as a forward thinking green campus. Empowering and

supporting the students and staff to act in accordance with the sustainability values that UBC Okanagan embodies will sustain behavior towards effective and efficient waste diversion practices.

GREENSTEP'S COMMENTS

Below is a list of pre-established processes and methods that were not accomplished on the date of the audit

1. **Plan:** All garbage bags and recycling bags to be placed on separate areas on tarp. **Actual:** some bags were mixed up (garbage in recycling area)
2. **Plan**: UBCO to organize enough volunteers to sort all garbage and recycling. **Actual**: Not enough volunteers/time to sort everything resulting in a visual sort only of recycling and samples taken from library and residence.
3. **Plan**: Waste sample from residence of 100 lbs total (25 pounds each from garbage and recycling from two residence types: apartment and traditional). **Actual:** Received a last minute sample from residence mixed buildings. Ended up sampling two bags for garbage from the mixed bags that were brought up, and all the bags for recycling (also from mixed buildings)
4. **Plan**: Audit of all compost from everywhere on campus for one whole day. **Actual:** The audit was completed on one day's worth of compost originating from inside all buildings for staff and student; this excluded compost produced by food services. UBCO staff estimated that the audited compost accounted for about 10-15% of the total compost produced on campus in one day.
5. **Plan**: Waste audit was to be run the course of the day 9-4pm. **Actual:** Maintenance informed the GreenStep team that they had to remove the garbage from the courtyard by 3:30pm. This resulted in a rushed completion with limited photos and observations.

THANK YOU

Thank you to all the volunteers, faculty, and staff that helped plan and complete UBC Okanagan's 4th biennial Waste Audit. Much gratitude to Derek Mahoney and Roger Bizotto, Sarah Bird, and Leanne Bilodeau for helping plan the audit and organize volunteers. Despite a couple of logistical challenges, we had a lot of fun and the audit definitely raised awareness and curiosity about UBC Okanagan's waste systems.

~ Allisha Heidt, Andrea Mackintosh, Lindsay Eason – GreenStep Solutions Inc.

MORE RESOURCES

GreenStep is available as a local resource to help UBC Okanagan establish or implement any of the recommendations and action items in this report. We are also available to solve issues that may arise and answer any questions.

GreenStep Solutions Inc
Ph 250-862-8941
www.greenstep.ca

Regional Waste Reduction Office
Ph 250 469-6250
www.regionaldistrict.ca
recycle@cord.bc.ca

Progressive Waste Solutions
Ph 250 765-0565
http://www.progressivewaste.com

Local Recycling Directory
http://www.regionaldistrict.com/media/21318/2004_recycle_dir.pdf

Recycling Council of BC
http://rcbc.bc.ca

Zero Waste Campuses (GrassRoots Recycling Network)
http://www.grrn.org/page/zero-waste-campuses

Zero Waste Campus (Concordia University)
http://sustainable.concordia.ca/working-groups/r4-rethink-reduce-reuse-recycle/projects/zero-waste-campus/

Report: Life Cycle Assessment of Hand Dryers (MIT)
http://msl.mit.edu/publications/HandDryingLCA-Report.pdf

Styrofoam Recycling (Local): Poly Rock (Jim Ripley) **www.polyrock.ca**

Websites to list and purchase reusable items
Casatanet www.castanet.net
Craig's List http://kelowna.en.craigslist.ca/