

UBC Social Ecological Economic Development Studies (SEEDS) Sustainability Program

Student Research Report

**Sustainability in Athletics: Textiles Recycling Program**

**Siobhan Finan, Sarah Haysom, Laura MacTaggart, Danae Shephard**

**University of British Columbia**

**GRS 397/457**

**Themes: Community, Materials, Waste**

**April 30, 2018**

*Disclaimer: "UBC SEEDS Sustainability Program provides students with the opportunity to share the findings of their studies, as well as their opinions, conclusions and recommendations with the UBC community. The reader should bear in mind that this is a student research project/report and is not an official document of UBC. Furthermore, readers should bear in mind that these reports may not reflect the current status of activities at UBC. We urge you to contact the research persons mentioned in a report or the SEEDS Sustainability Program representative about the current status of the subject matter of a project/report".*

UBC SEEDS PROGRAM  
**SUSTAINABILITY  
IN ATHLETICS:  
TEXTILES  
RECYCLING  
PROGRAM**

APRIL 2018

Laura MacTaggart

Siobhan Finan

Sarah Haysom

Danae Shephard



## Executive Summary

The aim of this SEEDS project was to develop a clothing and shoe recycling program model within a subset of UBC Thunderbird teams to reduce the waste from athletic gear. Four varsity teams were selected for the recycling trial: men's volleyball, men's basketball, women's volleyball and women's basketball. It is our hope that this recycling program will continue with these teams and expand to the other 21 varsity teams at UBC in the future. Furthermore, this project involved creating a survey tool that can be tested in a future SEEDS project to assess the sustainability literacy of varsity athletes and to better understand how they view the environmental impact of their sport.

The idea for this project emerged when one of our students attended the 2017 Association for the Advancement of Sustainability in Higher Education (AASHE) conference in San Antonio, Texas where members of the Green Sport Alliance presented on the possibility of advancing sustainability goals through sport. Specifically, the idea for this project is based off a program at Ohio State University where they have partnered with Nike to recycle approximately 4,000 pairs of shoes they purchase each season for their varsity teams (Oberly, 2018). All students in this SEEDS project are current or previous Thunderbird volleyball players and understand firsthand the challenges that athletes and sport managers face to reduce the environmental footprint of athletics.

The volleyball and basketball teams were first approached the week of January 29-31. The general overview of the project was explained and teams were given a recycling bin to put in their locker rooms. Two recycling bin collections occurred, on March 1<sup>st</sup> and April 3<sup>rd</sup>, where materials were weighed, sorted and put into storage at War Memorial Gym. The recycling program was very successful: after two months of collecting clothing, 137.48 lbs of material were donated (247 individual items) and donations included sport shoes, shirts, hats, children's clothing, sport balls and jackets. One key recommendation from this project is to expand the recycling program to include all 25 UBC varsity teams which would require a one-time payment of approximately \$1,922, approximately 37 hours per school-year and the involvement of teams, coaches and facilities staff. It is predicted that at least 3,500 lbs of gear and \$550 could be earned each year by recycling textiles with Trans-Continental Recycling Inc. Money from this project could fund further sustainability projects in athletics.

## Acknowledgement

Laura, Siobhan, Sarah and Danae would like to thank the following people for their support throughout this research project:

- UBC SEEDS, with special thanks to David Gill for providing useful advice and helping make this project a reality.
- Elizabeth Tiamzon for leading group photoshoots at War Memorial Gym.
- AMS Sustainability for providing grant funding to provide recycling bins and other materials required for this project.
- Brent Skura for his guidance over the course of this project.
- Jenny Black, for being a contact person within UBC Athletics.
- UBC Men's and Women's Volleyball and Basketball teams for their cooperation and participation in this project.
- Brian Wilson, Kshampta Hunter, Matt Dolf, Bud Fraser, Karen Storey and Jiaying Zhao for providing advisement and assistive resources for this project.

## Group Members



### Laura MacTaggart

As a fifth-year student in the BSc Global Resource Systems program and Thunderbird volleyball alumni, Laura's interests center around improving the sustainability of cities and human-behavior. Recently, she has taken a special interest to the green sport movement and is looking forward to pursuing further education and work in this field. During summer breaks, Laura enjoys returning home to her farm in Lacombe, Alberta where she takes part in gardening, hiking and camping with her family.



### Danae Shephard

As a fourth-year women's volleyball athlete and transfer student in the BSc Conservation program, Danae's academic interests center around the conservation of the world's resources, and she loves any opportunity to research, learn, and inspire others to share her passion for the natural world. Recently she has decided to pursue a science and management major, and would like to specialize in aquatic and marine environments. During time off from school and volleyball, Danae enjoys being outside with friends and family, either on the coast or back at home in Kelowna, British Columbia.



### Sarah Haysom

As a third-year women's volleyball athlete and student in the BCom Marketing program with a French minor, Sarah has always been passionate about sustainability. Growing up in North Vancouver, she spent the majority of her time out in the forest exploring nature. While playing varsity sports, Sarah was exposed to the enormous amount of waste that is continuously produced. Sarah is excited to have had the opportunity to decrease this waste while working on this project, and to have helped take a step towards improving sustainability in varsity sports.



### Siobhan Finan

Siobhan is a third-year women's volleyball student athlete pursuing a B.Sc. in Natural Resource Conservation. Siobhan also works within the department of Sustainability and Engineering at UBC educating professionals and students alike about sustainable architecture on campus. Siobhan's passion for sustainability has been lifelong, in Grade 4 she created the superhero 'Recycle Girl' to encourage students to recycle juice boxes and bottles for the program at her school. During her free time, you can find Siobhan enjoying the incredible natural beauty British Columbia has to offer hiking, canoeing, kayaking surfing, or skiing.

# Table of Contents

## Executive Summary

## Acknowledgement

## Group Members

### 1.0 Introduction

- 1.1 Background Information ..... 1
- 1.2 Objectives ..... 3
- 1.3 Deliverables ..... 4
- 1.4 Participants ..... 4

### 2.0 Methodology

- 2.1 Recycling Program ..... 5
- 2.2 Survey ..... 7
- 2.3 Spreading Awareness ..... 8
- 2.4 Survey ..... 8
- 2.5 Budget ..... 8

### 3.0 Results and Analysis

- 3.1 Recycling ..... 10
- 3.2 Study Limitations ..... 12

### 4.0 Discussion ..... 13

- 4.1 Recommendations ..... 13
- 4.2 Recommendations for Further Sustainability Initiatives ..... 16

### 5.0 Conclusion ..... 17

## Appendix

- Appendix A- Survey ..... 18
- Appendix B- Media Releases ..... 22

## References ..... 23

# 1.0 Introduction

## 1.1 Background Information

The University of British Columbia (UBC) is an internationally renowned institution for its research focus on sustainable resource use, climate change, green architecture and environmental sciences. Furthermore, the UBC Thunderbirds Varsity program is currently the most decorated athletics program in Canada with over 110 National titles and has produced 231 Olympians to date (UBC Thunderbirds, 2018). Despite these accomplishments, campus sustainability and varsity athletics have not yet collaborated on improving the sustainability of the Thunderbirds athletics program. This trend is found in sport programs across the world as sport managers, fans and participants struggle to find a balance between environmental sustainability and the consumerist patterns associated with being a spectator or participant (McCullough & Kellison, 2017). As awareness on this topic has grown, regional federations have developed to connect sport managers to share ideas for sustainability in sports. These include the British Association for Sustainability and Sport, Sports Environmental Alliance (Australia and New Zealand) and the Green Sport Alliance (North America). Recent research by Matt Dolf from the UBC Center for Sport and Sustainability has provided essential information to the field of sustainability in sport and has worked to quantify the environmental impact of varsity teams and facilities at UBC (2012). This SEEDS project aims to initiate progress towards improving the sustainability of the Thunderbirds program and generating ideas for further research in this field.

The term “sustainability” is most commonly explained by the definition from the 1987 Brundtland Report where sustainability, or sustainable development, is defined as that which “meets the needs of the present without compromising the ability of future generations to meet their own needs” (United Nations, 1987). Various literature attempts to explain the term “sustainability” and its three founding pillars: social, economic and environmental sustainability. All three themes of sustainability are integral for this SEEDS project. While we are working to improve the environmental sustainability of sports through materials recycling, social and economic factors must also be considered for the recycling project to be continued for future years.

### Why sport and the environment?

"Sport is a great unifier, transcending political, cultural, religious and socioeconomic barriers. It also wields a uniquely powerful influence, both cultural and economic, that provides much needed leadership in sustainable practices and, in so doing, promotes a nonpolitical public commitment to environmental protection"(National Resources Defense Council, 2012).

There are three pillars of sustainability; environmental, economic, and social. For some sports, such as hockey and skiing, the connection between sport and the environment is obvious--specific environmental conditions are required for the competitions to be held. For indoor sports, the relationship to the environment is much more abstract. None the less, “clean air, good nutrition, and stable, generally predictable weather” are necessary to achieve optimal performance (McCullough & Kellison, 2017). One of the least talked about, but perhaps one of the most important roles of sports teams, is the opportunity that sports have to generate awareness of environmental issues and to influence fans across the world to engage in

environmentally sustainable behavior, or in other words, to promote the social side of sustainability. As outlined in the “Routledge Handbook of Sport and the Environment”, “few other activities generate the passion and dedication that sport commands, seen in quite different ways in both the elite performer and the admiring fan” (McCullough & Kellison, 2017).

For many decades, sport has been used as a tool for social development as an individual’s integration into sports has been shown to improve an individual’s ability to partake in group activities and provides an outlet to channel aggression and frustration in a positive way. Many sportsmanship values align with those of sustainable development where both aim to create spaces where people of all age, gender, class, size, sexuality and race can actively participate to reach a common goal. Sport has the means to communicate what needs to be done in a non-threatening way to an audience that trusts them as a source (McCullough & Kellison, 2017).

For event managers, economic sustainability can express itself as working sustainably with the environment to maximize efficiency and reduce costs (McCullough & Kellison, 2017). Several reports directed by the National Resources Defense Council (NRDC) provide insight as to how greening professional and collegiate sport programs makes economic sense. One such report outlines how sport teams that have a green image have increased corporate sponsorships, entertainment clients and media coverage (NRDC, 2012). Also, that greening enhances fan experience, strengthens community ties, inter-departmental connections and builds local economic growth by supporting the alternative energy and other green economies (NRDC, 2012).

The textiles recycling program implemented in this project aligns with several targets from the UBC Zero Waste Action Plan. This includes to “implement multi-stream waste sorting and collection infrastructure and communications across campus by end of 2015” (UBC Campus and Community Planning, 2014). Next, to “increase diversion rates toward meeting the Metro Vancouver regional diversion targets” of 70% by 2016 and 80% by 2020 (UBC Campus and Community Planning, 2014). Finally, the textiles recycling program works towards decreasing “operational waste disposal to landfill/incineration steadily, despite campus growth, toward the long-term aspiration of a zero-waste campus” (Campus and Community Planning, 2014). While the UBC Department of Athletics and Recreation does not have a unique zero-waste plan, the recycling program works towards many of the departments goals, including to:

1. Increase participation
2. Deliver excellence on the national and world stage
3. Build school spirit
4. Nurture a strong sense of community
5. Cultivate an inspired workplace where staff are at their best (UBC Athletics and Recreation, 2018).

### **Why textile recycling?**

Worldwide less than 1% of textiles are recycled (Matteis, 2018). In North America that materializes as 11 billion kilograms per year of waste textiles (Matteis, 2018), or in Vancouver 40 million kilograms (Tetra Tech, 2016). It is also crucial to recognize that the technical



definition of recycling involves returning the material to its original form, this is often specifically referred to as closed-loop recycling. When a material is repurposed for lower value it is term 'down-cycling,' for example recycling textiles for insulation (Storry & Mckenzie 2018).

Textiles recycling is critically important to environmental, social and economic sustainability for several reasons. The textiles industry uses massive amounts of water, polluting dyes, and energy to arrive at their final product (Storry & Mckenzie 2018). For example, it is estimated that 2600 L of water, about nine bathtubs full, is involved in producing one single cotton T-shirt (Storry & Mckenzie 2018). As most clothing production occurs in developing countries, this creates an enormous social problem because critically needed water sources become polluted beyond repair, denying whole societies of clean drinking water (Shen et al. 2017). Economically, it is much more efficient to reuse materials, rather than pay for brand new materials and all the processing fees associated with them (Storry & Mckenzie 2018).

Textiles are also filling up large amounts of our landfills; in Vancouver it accounts for 5% of the total garbage waste (Tetra Tech, 2016). As these textiles slowly break down in landfills they release carbon dioxide into the atmosphere, further exacerbating the impacts of global warming (Wallander, 2012). Many of the materials however, do not break down. Due to technical advances in the clothing industry, especially the sports clothing industry, increased amounts of clothing have become synthetic. Synthetic clothing is extremely difficult to recycle, cannot break down in landfills and pollutes by releasing harmful microplastics, which often end up in the oceans (Boucher & Friot, 2017).

Sport provides an arena with great potential for textile recycling. Inherently, sports require large amounts of clothing, gear, and shoes for athletes to wear during training and competitions. There is also added pressure to constantly have brand-new gear to perform at the highest possible level. For example, the UBC Men's Basketball team received new pairs of shoes this year, Women's volleyball received 37 pairs, and next year both of these teams will likely receive at least that number of new shoes again (Personal Communications, 2018). On top of the brand-new gear required for training, for every different team an athlete plays for, they usually get new outfitting as well. Combining all these factors sums to a large amount of textile waste. Fortunately, sports have the added benefit of being in a position of power. Much of this textile waste also has great potential for resale or donation value because of its status and light use. Many athletes are celebrities, with a large and influenceable following. This should be used as a tool at UBC, since the greatest potential for generating change in the community lies less with the specific amounts of material recycled, but instead with the athletes and their ability to influence, provide leadership, and raise awareness of sustainability in sports. If textile recycling can be promoted by key athletic figures, fans will follow.

## 1.2 Objectives

The objectives of this project are as follows:

- Reduce waste from clothing, shoes and sports gear
- Spread awareness of the environmental impact of varsity sport programs to student-athletes, coaches and the greater community
- Create a survey tool that can be used to assess the awareness among student-athletes of the environmental impact of their sport

### 1.3 Deliverables

This project collaborated with the UBC Department of Athletics, UBC Sustainability and Engineering and the Center for Sport and Sustainability to achieve the following deliverables:

- Implement a recycling program with four varsity teams to divert waste from shoes, clothing and gear, and make recommendations for this to be adopted by all UBC Varsity teams.
- Create a survey that assesses an athlete's understanding of "sustainability"; their perception of the environmental impact of their team and venue; possible solutions to decrease the environmental impact of their sport and facilities.
- Presentation to UBC Stakeholders
- Make a series of recommendations to SEEDS, UBC Department of Athletics, Sustainability and Engineering for future research and projects to improve the sustainability of UBC Varsity Athletics.

### 1.4 Participants

This project involved a subset of UBC varsity teams to implement, monitor and manipulate a clothing recycling program model. The four teams selected for this project were men's and women's volleyball and basketball teams, and each was selected based on several criteria:

- Environmental footprint: Based off Matt Dolf's Life Cycle Assessment of UBC varsity teams, men's basketball has the largest environmental footprint of any campus team while women's volleyball, men's volleyball and women's basketball ranked 5<sup>th</sup>, 6<sup>th</sup> and 7<sup>th</sup> respectively (2012).
- Gender: Both men's and women's teams were included to assess whether a relationship exists between gender and project participation.
- Schedule: Involve teams who are currently competing in regular Canada West season play and participating in regular practices and competition throughout the duration of the project.

Each team involved in the study trains and competes at War Memorial Gym which is located off Westbrook Boulevard in the heart of the UBC campus. Apart from the ease of completing the project in a single location, War Memorial Gym is also an ideal location as it contains the offices for many of the athletics staff and coaches. Throughout the project, speaking to various athletics staff and spreading the word about our project was easily done. Due to staff encouragement, decisions were made to involve staff and coaches in the project by placing a recycling bin in the Welcome Center of War Memorial Gym, also known as the foyer in the staff office area.

**Table 1** indicates the size of each participating team and the amount of gear bought for the 2017-2018 season. This information is useful for multiple reasons. First, it provides context as to the volume of gear purchased per team in one year and how much will eventually be thrown in the landfill. Next, this information can be used as a comparison to the items collected from recycling bins to assess what and how much is being recycled. Due to team discounts, total cost of gear could not be calculated.

<b>Team</b>	<b>Size of Team</b>	<b>Gear purchases for 2017-2018 season</b>
<b>Men's Basketball</b>	16 players	Shoes (pairs): 64 Shirts: 64 Sweat suit: 16 Fleece hoodies: 16 Pants: 16 Socks (pairs): 96 Backpack: 16
<b>Women's Basketball</b>	13 players plus 9 staff	Shoes (pairs): 13 Shirts: 28 Hoodie: 22 Shorts: 18 Pants: 17 Jacket: 14 Bags: 8
<b>Men's Volleyball</b>	18 players plus 4 staff	Shirts: 106 Hoodies: 22 Shorts: 76 Pants: 22 Jacket: 22 Jerseys: 54 *Men purchase shoes individually
<b>Women's Volleyball</b>	13 players plus 3 staff	Shoes (pairs): 37 Shirts: 14 Shorts: 39 Pants: 18 Hoodies: 22 Jerseys: 36 Socks (pairs): 68 Backpacks: 21 Kneepads (pairs): 34

*Table 1* indicates the size of each team according to unofficial roster (University of British Columbia, 2018) and the approximate cost of athlete's gear for the 2017-2018 season. Data retrieved from team receipts.

## 2.0 Methodology

### 2.1 Recycling Program

Recycling bins were purchased online from Uline, as the company offers a variety of bin shapes, sizes and colors. Uline is an existing supplier for War Memorial Gym, facilitating the organizing of future purchases. It was suggested to use green bins, as the color stands out from other recycling bins (typically blue). The green bin could be used in the future to symbolize the "Green Thunderbirds" program. Two large green 32 Gallon bins were purchased (see *Figure 2*), one

placed in men's basketball changeroom and the other in the joined bathroom for women's volleyball and basketball teams. In addition, two smaller green 14 Gallon bins were purchased, one placed in the men's volleyball changeroom and the other in the Welcome Centre of War Memorial Gym (see *Figure 1*). Furthermore, four Sterilite storage bins were purchased for the operations of this project to store excess materials between collections and pickups.

Initial meetings with teams were held between January 29-31 at War Memorial Gym, where one-to-two group members provided teams with their recycling bins and described the project and its contribution to sustainability. During these dates, each team was approached at the beginning or end of their practice time to accommodate to their schedules. It was decided to have two collections of recycled clothing: one at the project halfway point in early March and another at the end of the project in early April.



*Figure 1* demonstrates one of the 14 Gallon recycling bins used during the project.



*Figure 2* demonstrates the larger 32 Gallon recycling bin/lid and the signage for project advertisement and guidelines for accepted donations.

During the collection process, several measures were taken to assess the success of the project. First, all donated items were weighed (lbs) using a hanging scale. This measurement is important since it informs partners, such as Trans Continental Textiles, about how much material was being donated. Since they provide reimbursement based on the weight of materials donated, this is an important metric to collect. Also, items were sorted and counted based on the type of good (eg. shoes, shirts and shorts). This provided insight as to what teams were providing the most material, and what type of material was being donated more often. This information can provide insight into the life-cycle and turnover rate for each article of clothing.

### **Trans-Continental Textile Recycling Ltd.**

Trans-Continental Textile Recycling Ltd. from Surrey, BC was specifically selected as a partner for this project because they are local, operate a meticulous breakdown and recycling of materials and commit to community service initiatives. The company accepts all clothing, used or unused, including paired socks and shoes. New and gently-used items are cleaned and re-sold in a small store on the ground level of their warehouse in Surrey, BC. Heavily-used clothing and shoes are broken down to threads and base components that can be repurposed into items such as cloths and rags. This was especially appealing for this project as most sport clothing and gear is heavily worn and is in poor condition to be re-worn by people in the community. Furthermore,

Trans-Continental has experience in accepting branded items, such as jerseys and uniforms, that are sensitive to being redistributed in the community. To alleviate this problem, Trans-Continental agreed to de-thread Thunderbird jerseys and other items displaying logos until the individual fibers are left and can be repurposed. The company's operational costs are covered by selling clothing, threads and textiles to areas all over the world.

Another benefit of partnering with this company is they offer pickups for clothing drives and they offer financial reimbursement for donations over 500 lbs. Reimbursements begin at \$0.08/lb and do not exceed \$0.22/lb. Reimbursement rates start at 500 lbs donations and increase at 1,000 lbs and 3,000 lbs. A payment of \$0.20/lb is provided for materials that are dropped off at the company warehouse in Surrey. Money earned from this project could internally fund future sustainability projects in athletics.

## 2.2 Survey

A survey (see *Appendix A*) was created to be used as a tool for a SEEDS project in the future. The purpose of the survey is to assess the sustainability literacy of varsity athletes and to better understand how they view the environmental impact of their sport. Capturing an athlete's understanding of "sustainability", their perception of their team and venue's environmental impact, and their solutions to decrease the environmental impact will aid with future research. Due to time constraints, collection of survey results from the 4 varsity teams could not be conducted. In lieu, the survey questions have been refined to use as a tool for future research.

### **The survey is composed of three main parts:**

First, the demographic information is stated at the beginning. The survey asks each athlete for their age, gender, program of study, year of study, and duration of residence in Vancouver. This demographic information is used as a characteristic of the total population. Asking athletes to answer these questions will be useful when analyzing all the data. By using cluster sampling, this tool can be used in the future to compare the results for varsity athlete with the results of non-varsity athletes.

Secondly, three open ended questions are stated. While having an open-ended question makes it difficult to record data, it is a useful tool to collect responses without the limitations of a closed answer response. This survey style allows athletes to state their opinions, without any thought provoking questions that could potentially hinder their answers. The placement of these three questions at the beginning of the survey is crucial - having the questions listed after the multiple-choice questions could perhaps lead to biased or misleading results.

Lastly, 12 multiple choice questions are stated. These questions were taken from Kshamta Hunter, Claire Crowther and Will Valley, from the SEEDS projects that undertook the development of UBC Sustainability Literacy in 2016 (Hunter, Crowther & Valley, 2016). Hunter had created a sustainability literacy survey in Fall 2017, which were presented to a sample of UBC students. Hunter's questions have already been used on a group of UBC students, but results have yet to be collected. By presenting these same questions to a group of varsity athletes, it will be possible to gauge how well-informed varsity athletes are compared to the normal UBC student population. If results indicate that varsity athletes are not well-informed about sustainability-related topics, this could trigger the need to increase sustainability education among student-athletes. This could include information sessions, signage at sport venues or other

resources to help improve varsity athletes' comprehension about sustainability in their sport. If results indicate that student-athletes are well-informed about sustainability-related topics, there could be opportunities to explore greater athlete engagement in sustainability initiatives and promotion.

## 2.3 Spreading Awareness

As outlined in the project deliverables, it is of the utmost importance that this project be shared with as many people as possible. Only a few sources of literature exist that outline the relationship between sustainability and sports. Furthermore, this concept is poorly represented in sport programs in Vancouver and across the world. Mega sport events, such as the Olympics, taint society's perception of sports to view them as highly consumeristic programs. It is for this reason that throughout this project, relevant media sources were contacted to share information of this project and the possibilities that exist to improve sustainability of athletics programs. Articles were published by the following media sources:

- UBC Sustainability website
- GoThunderbirds website
- The Province
- CityTV Breakfast Television
- Roundhouse Radio

See *Appendix B* for links to media releases. Hopefully, spreading awareness of this topic at UBC will generate a conversation among students and staff around the environmental standards of sport events and their facilities and will gain support for similar projects. This is the first SEEDS project that combines textiles recycling and sport and hopefully, it will inspire staff, professors and students to conduct similar projects in the future.

## 2.4 Timeline

Two timelines were created for this project. *Table 2* outlines the overall timeline of the project between December and April while *Table 3* includes how much time was spent on the recycling project. The values from *Table 3* were used to inform the recommendations regarding the expansion of the project. See *Figure 5*.



**Table 2: SEEDS Project Timeline**

<b>Task</b>	<b>Start/End dates</b>
Preliminary meetings with key stakeholders (Dan Cooper, Adriana Laurent, Steph Mihalatos, David Gill)	November 2017
Submit application for AMS Sustainable Projects Fund	November 27, 2017
Submit project proposal	December 7, 2017
Project kickoff meeting	December 12, 2017
Preliminary research and meetings with stakeholders	December 13, 2017- January 15, 2018
Meet with coaches	January 8-12, 2018
Initial contact with teams (Introductions and recycling bins distributions)	January 22-26, 2018
First collection from recycling bins	March 1, 2018
Second collection from recycling bins	April 3, 2018
SEEDS project presentation	April 9, 2018
Submit final report draft for review	April 13, 2018
Submit final project report	April 25, 2018

*Table 2* indicates the SEEDS project timeline.

**Table 3: Recycling Project- Allocation of Time**

<b>Task</b>	<b>Description</b>	<b>Time</b>
Talking with teams	Explain the SEEDS project and recycling program, provide context to sustainability in sports	2 x 10-minute discussions per semester for each team*
Meetings with stakeholders	Meetings with David Gill, Bud Fraser, Gilles Lepine, Matt Dolf, Brian Wilson, Jiaying Zhao, Rahul Devaskar	~8 hours
Coordination and planning	Coordinating meetings with teams and stakeholders, project meetings	Coordinating = 5 hours Project meetings: 1.5 hours / week = 24 hours
Purchasing supplies	Researching and purchasing bins, stationary and promotional materials	3 hours
Promotions	Speaking with coaches, athletics and sustainability staff and journalists	4 hours
Collecting and sorting materials	Collected materials from each team bin, sorted, counted, and weighed them	3 hours
Presentation of results	Present recycling project results to stakeholders	Preparation: 20 hours Presentation: 2 hours
Total		70 hours 20 minutes

*Table 3* demonstrates the approximate time spent on various parts of the SEEDS project. \*2 x 10-minute sessions are optimal with teams to explain the program at the beginning of the semester and gather feedback at the end of the semester. Please note that schedule conflicts did not allow us to complete a concluding meeting with each team.

## 2.5 Budget

This project successfully received funding from the Sustainable Projects Fund (SPF) Grant operated through AMS Sustainability. The project was approved for \$775.00, however only \$542.37 was used. As indicated in **Table 3**, the majority of the cost came from purchasing recycling bins, lids and the storage containers for overflow material.

**Table 4: Total Budget**

Item	Description	Cost
Signage	8 laminated signs for recycling bins	\$ 34.86
Storage containers	4 containers for storage of gear before pickup occurs	\$ 57.21
Recycling bins and lids	4 recycling bins, 2 lids	\$ 234. 33
Stationary	Sharpie and tape for storage bin labeling	\$ 12.26
Transportation	Transportation of recycling bins to UBC campus	\$ 10.56
Photography	Student photographer honorarium	\$ 75.00
Garbage bags	Plastic garbage bags for clothing transportation	\$ 8.95
Mesh bags	10 mesh bags for storage and transportation of lost and found items in 10 sport facilities.	\$ 109.20
Total		\$ 542.37

**Table 4** indicates the total budget (\$ CAD) for the SEEDS project.

## 3.0 Results and Analysis

### 3.1 Recycling

Two collections of materials took place, on March 1<sup>st</sup> and April 3<sup>rd</sup> at War Memorial Gym. Results from both collection are summarized in **Table 4**. The two collections proved to have different results, both in quantity of donated items and in types of items being donated.

In the first collection, we received significantly more gear from women's teams than men's, receiving only 4 pairs of shoes and one shirt from both men's volleyball and basketball teams combined. Women's teams donated both a larger variety of items (9 types) and a greater total number of items overall (27 items). However, there was an overwhelming difference between the contributions from teams compared to the athletics coaches and staff. The small 14 Gallon recycling bin that was placed in the Welcome Centre was repetitively filled and emptied into storage by facilities staff Jenny Black. One hundred and ninety-eight items, equaling 91.58 lbs of materials, were donated by athletics coaches and staff in the first month of collections. In the second collection, we received much fewer donations from the bin in the Welcome Centre while donations from men's and women's change rooms remained similar. This time, only 1.95 lbs, or 6 items, were collected from the bin in the Welcome Centre while men's and women's bins received 4 donations (6.63 lbs) and 31 donations (11.27 lbs) respectively. Overall, the first collection received 230 donations (117.63 lbs) while the second received 41 donations (19.85 lbs).



As outlined in the table below, men’s and women’s teams donated 15.71 lbs and 28.24 lbs of materials respectively while staff and coaches donated 93.53 lbs of material. There were significant differences in the diversity of items being donated by the various participants. For example, items donated from men’s and women’s teams were mostly sport-related and included shoes, knee pads, sport pants, sport shirts and socks. Items collected from coaches and staff included; family items such as baby clothing, hats, underwear and gloves; casual attire such as sneakers and polo shirts; and facility materials such as leftover fabric from special events decorations.

**Table 5: Textiles Recycling Collection Results (February & March)**

Items	Welcome Centre		Men's Teams		Women's Teams	
	Number	Weight (lbs)	Number	Weight (lbs)	Number	Weight (lbs)
Shoes (#pairs)	6.5	6.57	7	14.68	5	7.03
Balls	21	8.29			5	1.25
Bags	5	3.5				
Shorts	9	5.48	1	0.55	4	0.94
Shirts	87	30.94	1	0.48	20	7.24
Underwear	17	2.71			4	0.24
Baby Bib	1	~0				
Socks (#pairs)	11	1.02			10.5	1.75
Misc. fabric	2	1.26				
Pants	8	5.93			1	3.58
Tutus	5	0.69				
Jackets/Hoodies	21	22.91			1	2.62
Uniforms (tops and bottom)	5	2.94				
Hats	4	0.62			1	0.26
Gloves (#pairs)	1	0.49				
Scarf	1	0.18			2	0.94
Knee pads					5	1.25
Bra					3	0.57
Ankle braces (pairs)					1	0.57
<b>Total</b>	<b>204.5</b>	<b>93.53 lbs</b>	<b>9</b>	<b>15.71 lbs</b>	<b>34</b>	<b>28.24</b>

*Table 4* indicates the weight (lbs) and the number of items collected in various categories of gear from the four recycling bins in women’s volleyball/basketball joint washroom, men’s basketball changeroom, men’s volleyball changeroom and the Athletics Welcome Centre. Tiles highlighted in grey indicate nothing was collected from that bin in that category. Note: ~0 values indicate items whose weight was not measurable by the scale.

### 3.2 Study Limitations

- I. In the interest of time, the clothing collection only occurred over a 2-month period. However, we predict that certain times of the year would have greater inputs of gear. I.e. the beginning of a new season when new gear arrives and old gear is thrown out.
- II. The goal of the project was to have two in-person meetings with the teams. The first, to explain the project and the instructions for the recycling bins. The second, to share results and gather feedback on the project. However, a second meeting was not possible as teams no longer held regular practices after the end of their competition schedule.
- III. We could not test the survey on teams due to time limitations and restrictions from the Ethics Review Board. However, it is our hope that this survey will be conducted by a SEEDS team in the future and they can draw comparisons to results from the campus-wide sustainability literacy assessment.

### Infrastructure Limitations

- I. An extremely small amount of material at Transcontinental Textiles is up-cycled, meaning it is only being given one more use. This is because of the limits in current materials recycling technology which is not yet able to recycle blends and polyesters.



*Figures 3 and 4* show SEEDS group members Sarah Haysom, Danae Shephard and Siobhan Finan sorting used clothing in War Memorial Gym.

## 4.0 Discussion

Based on the data from the materials collections, several trends can be identified. First, more items were donated from women's than men's teams and that they donated more varied items. This could be a result of turnover rate- the amount of time an individual uses an article of clothing before throwing it out. Perhaps men are more likely to use clothing longer and throw them in the trash less often than women. Furthermore, the location of the bins in each team's locker room could have contributed to the success of the recycling program as they impact the visibility and accessibility of the bin. For example, the 14 Gallon recycling bin in the men's volleyball changeroom was placed on a closet shelf in the corner of the room. This bin was less visible and accessible than the 32 Gallon bin placed in the joint washroom of women's volleyball and basketball teams. Furthermore, facilities staff mentioned how men's changerooms are consistently less organized than women's changerooms. The cleanliness and organization of a changeroom could impact an individual's ability to find old materials and recycle them.

Another trend that donations from coaches and staff were much more diverse than those from the athletes, including items as unique as children's tutu's and baby bibs. Considering the demographic of individuals using this bin from the Welcome Centre (includes more varied demographic of 30+ individuals and those with spouses and children), it makes sense that items from home would be brought in and donated. Furthermore, this demographic might have access to a car and could more easily transport large amounts of used clothing to UBC to donate whereas students would likely have to carry it across campus and/or on the bus. It is important to recognize the large decrease in donations from the Welcome Centre bin from the first to the second collection and consider potential causes for this change. One cause for this change is War Memorial facilities manager, Jenny Black, mentioned emptying all items from the facilities lost and found into the recycling bin in the Welcome Centre. Furthermore, staff may have had an accumulation of used family items at home that they wanted to dispose of to clear space in the house. This could include clothing that young children have outgrown. Once these items were gone, they had no more to donate. Perhaps the most likely cause for the change in donated materials is due to the decreased advertisement in the second month of collections. At the beginning of the first month, a group-member visited each team and an e-mail was sent out to all staff and coaches in War Memorial Gym describing the project and outlining what could be donated. For the second month, teams and staff were not contacted. While this was not intentionally done, it undoubtedly affected the motivation of individuals to donate items. Further research is recommended in this area, to determine whether this would be a long-term trend or just a one-time occurrence.

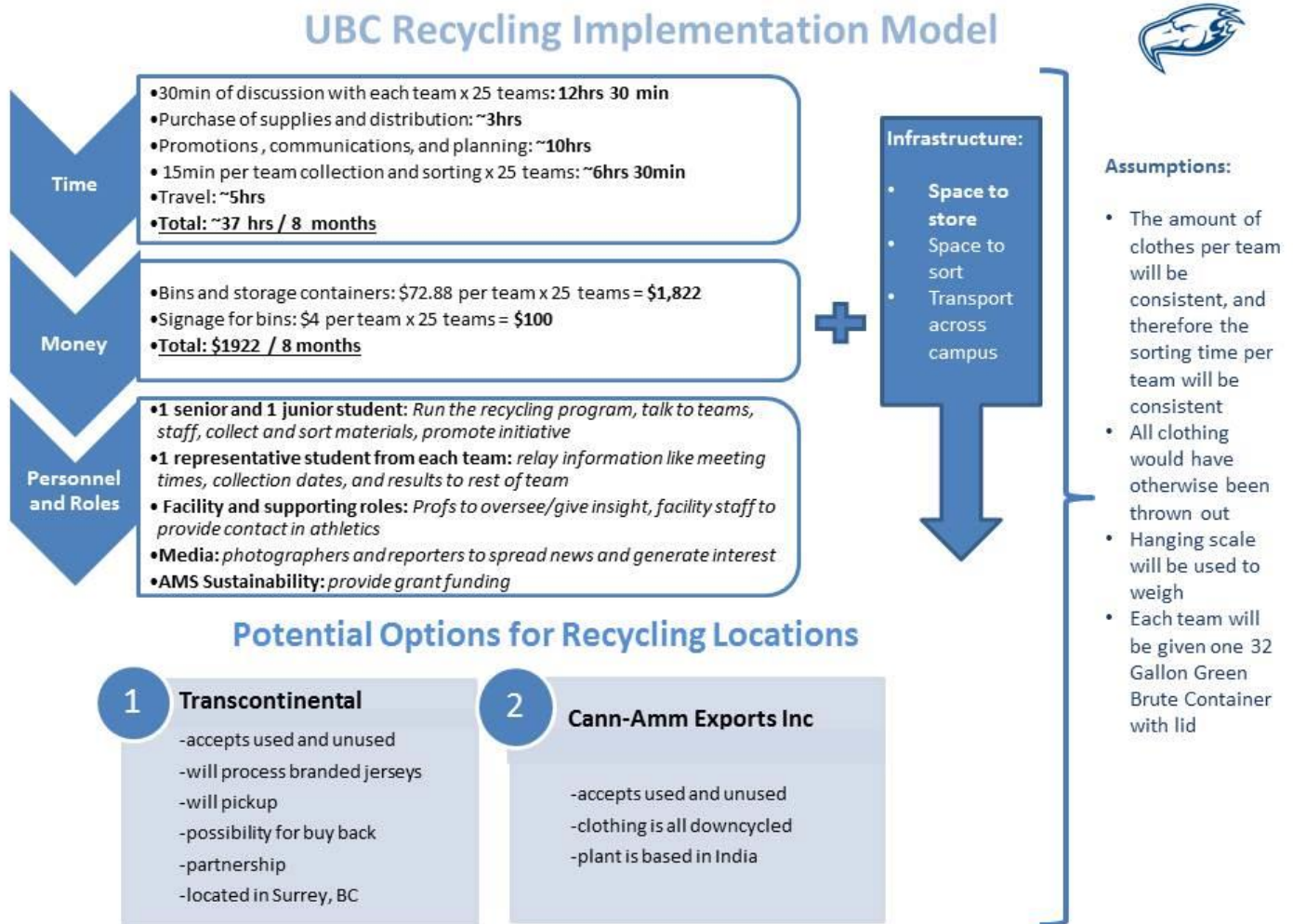
## **4.1 Recommendations**

This SEEDS project revealed many opportunities that exist within the UBC Athletics program to advance sustainability goals while building school spirit and a sense of community. Several recommendations are made to both expand the materials recycling program and other sustainability initiatives within UBC Athletics.

### **Recycling Program**

As described throughout this report, the recycling program was a success after only two months of materials collections, small amounts of advertisement, and the involvement of only four varsity teams. One of the key deliverables of this program was to ensure it could be applied to all 25 varsity Thunderbird teams. A visual model was created to outline the approximate costs and

commitments necessary to implement this recycling program to other varsity sport teams. **Figure 5** includes the various costs, time, personnel and infrastructure required to expand the recycling program.



**Figure 5** demonstrates the approximate cost, time, personnel and infrastructure to implement the materials recycling program to all UBC Varsity teams. Note: most calculations are for an 8-month period as that is the duration of a school year when the majority of student-athletes are at UBC.

### Assumptions

This model makes several assumptions. First, that the system used this semester would be scaled up. Second, that the amount of clothing donated from each team would be consistent and therefore the cost, personnel and time for sorting would be equal for each time. Of course, this is likely not true as teams vary greatly in size (eg. Football vs. golf), in the amount of gear provided each season, and in the time of year that each team will donate (ie. More donations in the beginning and end of seasons). As well, it does not include opportunities for other facilities and staff beyond the teams to donate material. Next, this model assumes that the clothing donated

would have otherwise been thrown out. This may not be the case. This can be better understood once the survey is issued to the teams (see *Appendix A*). Finally, in the cost calculations, we assumed that each team will be given one 32 Gallon Green Brute container with lid. It is possible that other containers may be used or that larger teams, such as men's football and rugby, may be given more than one bin.

### **Time**

The amount of time required to implement this project is approximately 27 hours over an 8-month period. This includes discussions with teams, purchasing supplies, promotions and communications and the collecting and sorting of goods.

### **Money**

One of the benefits of the materials recycling program is how relatively inexpensive it is. The only costs included in this model are for storage bins (\$ 1,822) and bin signage (\$ 100). However, it is possible that other costs will arise such as transportation costs for donated items (between campus facilities, between campus and Trans-Continental Textiles in Surrey). None the less, the projected cost of \$ 1,922 is a one-time cost and would only need to be paid at the beginning of the project.

### **Personnel and Roles**

The work necessary to implement this project across all teams can be divided up between students, athletics and facilities staff, and athletes. For student-athlete involvement, creating a sustainability director within the Thunderbird Athletic Council (TAC) would benefit the program as they could facilitate and oversee the recycling program. Furthermore, each team could have a sustainability representative who is to keep in contact with the TAC sustainability director for when their team's bin is full and needs to be emptied into storage.

### **Infrastructure**

The recycling program requires one, or several, spaces on campus where materials can be stored for a short-term period before being sent to Trans-Continental Textiles in Surrey. It is of the utmost importance that facilities staff are on board with this project as they would be key in assigning and monitoring storage spaces. This program would also require access to a UBC vehicle for the transportation of materials around campus or from the more remote facilities (ie. John M.S. Lecky Boathouse).



## 4.2 Recommendations for Further Sustainability Initiatives

Several recommendations are listed below:

### **Recommendations for the Department of Athletics:**

- Create a position for an Athletics Sustainability Coordinator who would have the primary responsibility of managing the recycling program, and can lead sustainability initiatives within Athletics and act as a liaison between athletics and campus sustainability organizations.
- Create a sustainability representative within the Thunderbird Athletic Council (TAC) to direct student-athlete-led sustainability initiatives.
- Collaboration with Campus and Community Planning's Sustainability and Engineering to organize zero waste game days, zero waste practices, pilot textiles recycling on game days, and explore opportunities to procure highly recyclable equipment
- Continue to prioritize building new campus athletic facilities according to LEED building standards and designate space in new facilities for storage of recycled clothing.
- Post educational signage at each sport facility to inform guests, athletes and staff about the energy usage and environmental footprint of each facility.

### **Recommendations for Varsity Thunderbirds teams:**

- Collaborate with sustainability coordinator and clothing sponsors for creation of more environmentally sustainable gear. Explore options to purchase gear made from recycled materials.
- Decrease volume of gear and jerseys purchased each year.
- Manage future gear purchases to buy materials that can easily be recycled (cotton and wool) and less that are difficult to recycle (polyester).

### **Recommendations for textiles recycling program:**

- Expand textiles recycling program to all 25 varsity teams at UBC.
- Collect lost and found items from facilities.
- Continue to sort and weigh materials being collected to track what is being collected and identify peak donation times.

### **Recommendations for further research:**

- Conduct another SEEDS project using the survey tool that was created during this project.
- Possibly sell used T-bird jerseys ending up in our recycling to fund recycling program?
- Look into post-construction adaption options for athletics buildings (ie. Increasing thermal insulation, opting for high efficiency bulbs) to decrease carbon impact.
- Explore options to purchase carbon offsets to minimize the carbon footprint of varsity travel.
- Study multiplier effect of sport leadership in sustainability
- Explore options to improve waste management practices at stadium
- Develop athletics-specific procurement guidelines
- Explore where the program could expand to, such as staff, events, and student housing

## 5.0 Conclusion



Based on the results of this project, there is a high demand for a materials recycling program both for athletes, coaches and staff. Furthermore, the relative ease and affordability of this project makes it a positive initiative for the Athletics department to continue in the coming years. While the implementation of the recycling program was a success, the value of this project goes above this deliverable. The impact of this project on the school community was quite large. During the report presentation, members from the Department of Athletics, Thunderbird Athletic Council, UBC Sustainability, UBC Equity and Inclusion, UBC Building Services and UBC Facilities and Engineering were all brought together in a room where they discussed a common goal—a more environmentally sustainable athletics program. By bringing these various stakeholders together, many connections were made and plans for future initiatives began.

Furthermore, this project reached out to the community via an article on the GoThunderbirds website, an article in the Province, an interview on City TV and an interview on Roundhouse Radio. Each media outlet expressed their interest in this program and their desire to share the news as it grows and evolves. The general community support expressed for this project has generated some positive momentum for the growth and continuation of the recycling program and for other sustainability projects within UBC Athletics. UBC is well positioned to make a difference in this field, given its research capacity and sustainability focused ambitions, which gives it the opportunity to become a global leader in sustainability and sports. Hopefully, the Thunderbirds Athletics program will set an example for children's, university and professional teams in the community who will be inspired to follow their lead.





4. What do the 4R's of waste management stand for?
- a) Refuse, Reduce, Reuse, Recycle
  - b) Reduce, Reuse, Recycle, Rent
  - c) Refurbish, Renovate, Rescue, Recycle
  - d) None of the above
  - e) Don't know
5. The combustion of fossil fuels emits greenhouse gasses, which are measured in terms of carbon dioxide gas equivalency. Which of the compounds listed is the most potent greenhouse gas?
- a) Carbon dioxide
  - b) Methane
  - c) Hydrofluorocarbons (HFCs)
  - d) Sulphur Hexafluoride
  - e) None of the above
  - f) Don't know
6. Ozone forms a protective layer in the earth's upper atmosphere. What does ozone protect us from?
- a) Acid rain
  - b) Climate change
  - c) Sudden changes in temperature
  - d) Harmful UV rays
  - e) None of the above
  - f) Don't know
7. What is NOT considered essential characteristics of a green building?
- a) Well insulated building exterior
  - b) Constructed to minimize air leakage
  - c) Constructed using building materials that have a low environmental impact
  - d) Use renewable energy so that levels of energy demand are not impacted
  - e) Toilets, showers and sinks that minimize water use
8. What are some of the main impacts of deforestation? Choose all that apply.
- Increased soil erosion
  - Potential loss of biodiversity
  - Impact on cultural practices of those who value forests
  - A source of carbon emissions
  - None of the above
  - Don't know
9. What are some sustainability, health and wellbeing benefits of active transportation? Choose all that apply. (Definition provided: Active transportation refers to any form of human-powered transportation)
- Promotes physical activity
  - Reduces sedentary behavior
  - Reduces GHG emissions
  - Improves air quality
  - Don't know



10. Where does most of Metro Vancouver's tap water come from? (see map above)
- Fraser River
  - ~~Burrard Inlet~~
  - Okanagan
  - None of the above
  - Don't know
11. What does '~~unceded~~ territory' mean?
- Title to the land has been relinquished to the government by treaty or otherwise
  - Title to the land has not been relinquished to the government by treaty or otherwise
  - Title to the land is retained by both First Nations and Second Nation government
  - Title to the land is retained by First Nation people only
12. What goes into calculating the life cycle impacts of a product like a piece of paper? Choose all that apply.
- The impact (not cost) of raw materials to make the product
  - The monetary cost of environmental damage caused by production
  - The environmental impacts of transporting that product from its manufacturing location to your location
  - The human health impact of the chemicals in the product
  - None of the above
  - Don't know
13. What are the benefits of fair trade for producers? Choose all that apply.
- Access to markets (buyers)
  - Access to credit (loans)
  - Worker protection through international development programs
  - Access to long term relationships with buyers
  - No benefits for producers
  - Don't know

14. Where do you primarily obtain sustainability knowledge at UBC? Choose all that apply.

- Sustainability-oriented courses
- Student clubs, groups, or organizations
- Sustainability-oriented program
- Volunteering
- UBC sustainability events (talks, lectures)
- Informal conversations with friends and peers
- UBC news (i.e. The ~~Ubcyssey~~ UBC Sustainability newsletter)
- Other: \_\_\_\_\_

15. What do you do with your old sports clothing and shoes once they wear out? Choose all that apply.

- Throw it away
- Sell it
- Recycle it
- Donate it
- Give it to friends or family
- Throw it in a pile in my room
- Other: \_\_\_\_\_

*Thank you for taking the time to complete this survey. If you have any questions regarding the survey, please contact (blank) for more information.*

## Appendix B- Links to media releases

### **GoThunderbirds publication:**

<https://www.gothunderbirds.ca/news/2018/4/9/womens-volleyball-thunderbirds-blue-and-gold-goes-green.aspx>

### **The Province article:**

<http://theprovince.com/sports/university/ubc-womens-volleyball-goes-green>

### **Interview on Roundhouse Radio:**

<http://cirh2.streamon.fm/listen-pl-15468>

### **City TV Breakfast Television:**

<https://spaces.hightail.com/receive/NsccqroQgl/fi-ecd50ac2-7a79-4ed7-a6e0-de1e8b96c49e/fv-3926fcc0-22fa-492a-b14b-1d1ff9ef986a/16Apr2018%20Breakfast%20TV%20athletics%20recycling.mp4>

### **UBC Sustainability website:**

<https://mailchi.mp/ubc/ubc-sustainability-news-2852773?e=2e2e26afc8>

## References

- Boucher, J. and Friot D. (2017). Primary Microplastics in the Oceans: A Global Evaluation of Sources. Gland, Switzerland: IUCN. 43pp.
- Dolf, M. (2012). *Life Cycle Assessment of the UBC Teams, Events, and Venues*. Retrieved from <http://cfss.sites.olt.ubc.ca/files/2011/01/Life-Cycle-Assessment-of-the-UBC-Thunderbirds-teams-events-and-venues.pdf>
- Dolf, M., & Teehan, P. (2015). Reducing the Carbon Footprint of Spectator and Team Travel at the University of British Columbia's Varsity Sports Events. *Sport Management Review*, 18(2), 244-255. doi:10.1016/j.smr.2014.06.003
- Dolf, M., Vigneault, A., Storey, S., Sianchuk, R., Teehan, P., Zhang, S., & Adams, T. (2011). UBC Athletics & Recreation Sustainability Project: Measuring the Climate Change Potential Impacts of a UBC Thunderbirds Men's Basketball Game. *Online Report*. Retrieved from <https://open.library.ubc.ca/cIRcle/collections/graduateresearch/42591/items/1.0222975>
- Hunter, K., Crowther, C., Valley, W. (2016). *UBC Sustainability Literacy*. Retrieved on March 29 from <https://open.library.ubc.ca/cIRcle/collections/undergraduateresearch/18861/items/1.0343114>
- Matteis, S., & Agro, C. (2018). What really happens to old clothes dropped in those in-store recycling bins. *Canadian Broadcasting Company*. Retrieved March 29, 2018 from <http://www.cbc.ca/news/business/clothes-recycling-marketplace-1.4493490>
- McCullough, B., Kellison, T. (2018). *Routledge Handbook of Sport and the Environment*. New York, NY: Taylor and Francis.
- National Resources Defense Council. (2012). Game Changer: How the Sports Industry is Saving the Environment. *Online Report*. Retrieved from [http://greensportsalliance.org/resources/P\\_NRDC%20Game%20Changer.pdf](http://greensportsalliance.org/resources/P_NRDC%20Game%20Changer.pdf)
- National Resources Defense Council. (2013). Collegiate Game Changers: How Campus Sport is Going Green. *Online Report*. Retrieved from <http://greensportsalliance.org/resources/NRDC%20Collegiate%20Game%20Changers%20Report.pdf>
- Oberly, G. (2018). Personal Communication (e-mail), April 9, 2018.
- Potteiger, K., Pitney, W., Cappaert, T., & Wolfe, A. (2017). Examining the Environmental Effects of Athletic Training: Perceptions of Waste and the use of Green Techniques. *Journal of Athletic Training*, 52(12), 1121-1130. 10.4085/1062-6050-52.12.20
- Shen, B., Li, Q., Dong, C., & Perry, P. (2017). Sustainability Issues in Textile and Apparel Supply Chains. *Sustainability*, 9(1592), 1-6. doi:10.3390/su9091592
- Storry, K., & McKenzie, A. (2018). Unravelling the Problem of Apparel Waste in the Greater Vancouver Area. *ResearchGate*. doi:0.13140/RG.2.2.26792.26886

- Tetra Tech. (2016). 2016 MV Waste Composition Monitoring Program. Retrieved March 31, 2018, from <http://www.metrovancouver.org/services/solid-waste/SolidWastePublications/2016WasteCompositionMonitoringProgram.pdf>
- UBC Athletics and Recreation. (2018). University of British Columbia Department of Athletics and Recreation: Mission and Vision. Retrieved online on April 26, 2018 from <https://www.gothunderbirds.ca/sports/2009/10/19/dept-vision.aspx>
- UBC Campus and Community Planning. (2014). UBC Vancouver Campus Zero Waste Action Plan. *Online Report*. Retrieved from [https://sustain.ubc.ca/sites/sustain.ubc.ca/files/uploads/CampusSustainability/CS\\_PDFs/RecyclingWaste/Zero\\_Waste\\_Action\\_Plan%202014%2010%2003%20final.pdf](https://sustain.ubc.ca/sites/sustain.ubc.ca/files/uploads/CampusSustainability/CS_PDFs/RecyclingWaste/Zero_Waste_Action_Plan%202014%2010%2003%20final.pdf)
- United Nations. (1987). *Report of the World Commission on Environment and Development: Our Common Future*. Retrieved from <http://www.un-documents.net/our-common-future.pdf>
- University of British Columbia. (2018). *Department of Athletics and Recreation*. Retrieved from <https://www.gothunderbirds.ca/>
- Wallander, M. (2012, April 30). Why Ban Textiles From Landfills? Retrieved March 31, 2018, from [https://www.huffingtonpost.com/mattias-wallander/why-ban-textiles-from-land\\_b\\_1308038.html](https://www.huffingtonpost.com/mattias-wallander/why-ban-textiles-from-land_b_1308038.html)