Reducing Paper Consumption at St. Mary's College of Maryland

An Independent Sustainability Project Submitted for Consideration to Professor Barry Muchnick For ENST 450: Applied Sustainability Practicum

By Caitlin Whiteis

In attempts to decrease resource consumption at St. Mary's College, I am trying to lessen paper usage on campus. In order to accomplish this I will be encouraging students and professors alike to use Blackboard in order to reduce printing assignments. I will also be placing signs around computers and printers encouraging students to reduce the margins on the pages they print and reminding them to print correctly the first time. Lastly, a group of students from this class will be providing a procurement plan to administration which will include purchasing double sided printers and more environmentally friendly paper.

Introduction: Paper is ubiquitous; newspaper, printer paper, paper towels, toilet paper, flyers, handouts, receipts. The list continues ad nauseam. It has penetrated our lifestyle in almost every way, from work to home to hobbies and everywhere in between. Nearly 4 billion trees are cut down every year in order to make paper products; this destruction amounts to about 35% of all harvested trees.[1] The United States is by far the largest consumer of paper goods, consuming 187 billion pounds of paper each year.[2] This is a huge number, but how much of it do we recycle?

According to the EPA, Americans recycled about 65% of all paper products consumed in 2012. This is significant, but paper can only be recycled so many times before the quality is too low to be utilized. This means that there are still a lot of trees being cut and forests being cleared in order to provide enough paper to meet the demands of consumers.

During paper production, trees are cut down and physically chipped in small pieces. These wood chips are then chemically "pulped" by soaking them in an assortment of chemicals and water to break down the cellulose molecules and obtain a smooth product. This pulp then goes through a series of pressing and draining to dry out the pulp and produce the final paper product. Paper production requires an enormous quantity of natural resources, including water and oil, and releases harmful chemicals into the air. According to the EPA, the chemicals required to break apart the cellulose fibers used during chemical pulping pose threats to air quality. These chemicals include sodium sulfide and sodium hydroxide which turn into Sodium dioxide (SO_2) and pollutes the air.[3] In addition, in order to obtain a final product of white paper the pulp is bleached using chlorine. By-products of chlorine, called dioxins, have been shown to

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[1] http://www.ecology.com/2011/09/10/paper-chase/
[2] http://www.ecology.com/2011/09/10/paper-chase/
[3] http://www.epa.gov/ttnchie1/ap42/ch10/final/c10s02.pdf

cause reproductive difficulties and an increased risk of getting cancer in individuals that consume it for long periods of time.[4]

Water is a precious resource that is utilized in the production of paper. In the chemical pulping process, the wood chips are soaked in a mixture of water and chemicals. The water is then squeezed out of the pulp and discarded after use.[5] Although the use of water in paper making has decreased in the past half century, the paper industry continues to use water in almost all major processes of paper production.

There are 3rd party entities that control the quality and sustainability of paper products, such as the Forest Stewardship Counsel. It is the designated group that ensures paper is coming from sustainable sources and their mission is to "meet our current needs for forest products without compromising the health of the world's forests for future generations"[6]. Post- consumer content specifies the percent of the paper that comes from recycled materials, so if a ream of paper is 30% post- consumer content and FSC certified then it contains 30% recycled paper and 70% come from sustainable sources as designated by FSC standards.

The goal of my project is to instill the idea of source reduction to students and faculty as well as begin a change in the systematic use of paper at St. Mary's College of Maryland. Source reduction entails decreasing the quantity of the resource used rather than re-using that product. Instead of recycling the excessive amounts of paper that we use, we should aim to decrease our paper usage altogether. Of course recycling improves our ability to live sustainably, but by decreasing our paper usage we are able to decrease our carbon footprint in a meaningful way.

Context: Environmental sustainability requires the working together of both industry and environmentalists alike. The Houston Principles is an excellent example of labor and

[4] http://water.epa.gov/drink/contaminants/basicinformation/dioxin-2-3-7-8-tcdd.cfm
[5] http://www.madehow.com/Volume-2/Paper.html
[6] https://us.fsc.org/mission-and-vision.187.htm

environmental advocates working together to force the Pacific Lumber Company to take responsibility for clear-cutting California forests and treating its workers poorly (Charles, 2011). The Principles that this new alliance promised to uphold included making workplaces, communities and the planet safer by reducing waste and greenhouse gas emissions as well as promoting forward-thinking business models that encourage sustainability while protecting workers. This alliance is just one example of what can happen when groups of people work together to promote sustainability. If students, faculty, staff and administration worked together at St. Mary's to reduce resource use then big changes can be made. In "Greening the Ivory Tower," Creighton discusses that all parts of a college need to work together to make meaningful change (Creighton, 1998).

Colleges and Universities have a unique capability to make change, especially when the school has an environmental mind-set as well as clear goals. SMCM has a strong foundation in sustainability and aims to have a zero carbon footprint by 2020 (Riordan et al., 1989). Our Climate Action Plan contains a multitude of multifaceted approaches to going green, including increasing renewable energy sources and replacing state vehicles with ones that are more fuel efficient. Our Sustainability Fellow works to make SMCM more sustainable, along with our Climate Action Plan that lays out methods by which we can decrease our carbon footprint. Because we are so environmentally conscious we have a great opportunity to set the bar high and reduce paper by changing our behavior, equipment and buying habits.

Resources used in paper-making, such as energy, water, and trees, are in high demand and low supply, but St. Mary's can make a change. SMCM purchases and distributes significant amounts of paper and does not provide the option of duplex printing to students. Last year, SMCM physical plant purchased 4,400 reams of Forest Stewardship Counsel (FSC) certified

bright white copy paper; none of which contained post-consumer content (Crane, 1990). In order to situate SMCM into a more sustainable state of operations, we should aim to decrease the amount of paper we use.

Recycling paper is encouraged and highly praised at institutions, but how many trees could we save if we decided to push source reduction? Assuming students only use their $20 pay-for-print money provided within tuition, they are printing 200 sheets of paper ($0.10/ sheet). If students printed double-sided rather than single-sided then they're using 100 sheets of paper. If each student saves 100 sheets of paper and we have 1,819 students then a total of 181,900 sheets of paper is being saved. This equates to 364 reams of paper. One pallet (~400 reams of paper) requires 24 trees. We could save 24 trees if every student printed double- sided[7]. How many trees could we save if the paper we did use contained recycled content? St. Mary's used 4400 reams of paper in the 2013 school year which equates to 264 trees. If this paper was made with 30% post-consumer content we could have saved 79 trees. If we purchased recycled paper, fully utilized paper by decreasing margins and used blackboard rather than printing, we could save even more trees. This could be a major turning point for sustainability and if the idea of source reduction is pushed in the case of paper it could carry over to other things we use on a day to day basis like paper towels and toilet paper.

Case Studies: There were multiple case studies on which I based my research and my project plan. I looked for case studies that came from similar sized colleges as St. Mary's. Larger colleges are able to complete larger projects with more students simply due to high student population. I also looked for methods of reducing paper that are easy to understand and easy to accomplish. For example, reducing the margins on a piece of printed paper is easy to accomplish, but is not thought of to do. I also made sure that their ideas were put into use and resulted in

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[7] http://conservatree.org/learn/EnviroIssues/TreeStats.shtml

change. If students did not seem willing to change their actions in way that a case study had suggested then I would try something different.

The first case study I looked at was completed at Tufts University. Tuft's students aimed to decrease the amount of paper used on campus by encouraging students to push for paper reduction. Tufts started with the students because they felt that the students could push faculty and staff in a greener direction. Once the students begin to talk to staff and the staff realizes that paper reduction is important to the students, then they will begin to make paper reduction a priority. They encouraged students to talk with their professors and encourage them to use blackboard. The students also cited convenience as a reason to push blackboard. When students can submit their assignments online, they do not have to plan a trip to the library in order to print, assuming they do not have a printer at home. This was popular because it is much more convenient to submit via computer than having to find a printer somewhere on campus. Money was also named as a reason for students to push for online submission options. Rather than having to pay to print every document, students could submit assignments for free via Blackboard. I saw this as a similar way to encourage students at SMCM since we only have $20 in print money, which comes pre-loaded on our account in the beginning of the semester. If we do not have to print out assignments, we will not have to spend extra money on printing. Seeing as most business and people are on budgets, money is typically a positive incentive for change. Tufts students also devised a letter to faculty asking them to reduce their paper consumption by accepting online submissions and by encouraging their students to print double-sided (Appendix). Tufts students believe that there was no clear communication as to what the professor expected from the student and vice versa, but this can be cleared up by explicitly asking professors and students to discuss what each one wants. The Tufts students indicated that

they weren't printing double-sided because they believed the professor preferred it, but the professors indicated that they didn't care whether the assignments were printed single or double sided. By communicating, the faculty and students both get what they want, which is a reduction in resource consumption at their school. This is definitely applicable, because if students had made it known to administration that they liked the duplex printers, then they would have replaced the old duplex printers with new duplex printers rather than single sided. Students would also need to communicate with professors to push more online submissions since submitting papers online is very easy for students and professors alike.

The second case study I looked at was one by Pennsylvania State University. This University is obviously not very similar to St. Mary's in size, but they utilized simple techniques to decrease the amount of paper used by one building on the Penn State campus (Barlett & Chase, 2004). A professor in the Mueller building aimed to decrease their paper footprint by more fully utilizing the paper that it purchases in several manageable ways including decreasing margin width from standard 1" to 0.75", decreasing font size from 12 point 10 point, single spacing and double sided printing. A 100 page 12 point, double-spaced, single sided document with standard margins was able to be reduced to 20 pages after making those small adjustments. Although they did not provide methods of implementing change on campus, this case study gave me several ideas of *what* to encourage students to do in the name of paper reduction.

The next case study I looked at was of the University of Cincinnati converting their waste paper into fuel pellets that replaced the oil in their generator (Tu, Zhu, & McAvoy, 2015). It is not exactly pertinent to St. Mary's since we don't produce our own energy on campus, but this case study encouraged me to think big. There are so many opportunities for creative adjustments to everyday life in order to encourage and promote sustainability. An example of a big change

would be paperless exams. When a class of 60 or 70 students take an exam that is 5 pages, even printed front and back, they use 350 sheets of paper. Providing students a tablet on which to take the exam, which is then automatically graded, would save paper and time. Some details would have to be ironed out, such as restricting internet use/cheating which comes along with technology, but there are different options available that restrict internet access.

Project Overview: My goal was to 1) decrease the paper consumption and also 2) change the type of paper and types of printer procured. I first aimed to learn more about what type and how much paper is used by the St. Mary's College community as well as the methods and standards by which paper is purchased. In order to change a system you must first understand it. Using this reasoning, I began at the bottom, determining who bought the paper and how much of it. I then brainstormed different methods of paper reduction on campus and contacted the necessary individuals; some ideas fell flat and some gained traction.

The system for purchasing paper is more complex that I had originally anticipated. Apparently, each office and department of the college is allowed to purchase paper from wherever they desire; however most departments purchase it from physical plant for convenience. This means that there is no central database to determine the total amount of paper purchased unless someone were to contact every office and department on campus to gather a total. I also learned from Patrick Hunt that the State of Maryland has created a green procurement strategy for schools to use when making large purchases. This includes purchasing energy-star rated appliances, green cleaning supplies, etc. These guidelines are mandatory for state-funded institutions, but the institution themselves can create stricter guidelines to follow. I have been in contact with both Patrick Hunt and Alan Lutton who buy paper for Physical plant and the library respectively. I determined that these two departments purchased the most

significant amount of paper on campus and thus could cause the most change if printing practices

changed. I found that physical plant purchased 4400 reams of multipurpose business paper at a

cost of $29-$32 per ream. I was also interested in the break down (Crane, 1990). The breakdown

of how much paper is purchased by each building is shown in figure 1.

Office/building	# of cases
Goodpaster	86
Montgomery	60
Schaefer	52
Kent	50
Business	44
Admissions	32
Athletics	28
Financial Aid	26
Advancement	26
HR	21
Bookstore	20
Philosophy	20
Res Life	17
Student Activities	16
Cobb House	16
Whitehouse	10
Glendening	10
Office of Information Technology	9
Health	9
Public Safety	5
International Education	5
Registrar office	2
VPBR	1
total	565

Figure 1. Breakdown of number of cases of white, FSC certified copy paper purchased by

Physical Plant for fiscal year 2014.

I have been in contact with Alan Lutton, the purchaser for the library, but have yet to

receive a response. Initially I had spoken with him in person and sent three emails. I returned to

his office 4/13/15 and he told me that the library is looking for a new director so things have

been crazy but that he would get me that information by the end of this week (4/17). It is May 6th and I have yet to hear from Alan Lutton. I have contacted him 3 times and been to his office twice. At this point I don't think I'm going to get this information.

I also plan to put flyers up around the printers in the library and the basement of Goodpaster suggesting to students to decrease margins as well as print the correct thing the first time (Appendix). I have spoken with Conrad Helms, the Patron Services Librarian, who said to email him a copy of the flyer and he would be glad to post it next to the computers in the library. I hope to design a flyer that is catchier that figure 2 and that sincerely promotes a reduction in printing. There is also the consideration of instituting a mode of replacement. In order to make these signs meaningful having a system of replacement is important.

Lastly, I am going to suggest in the procurement plan that the school purchase energy-star rated duplex printers. One major way to decrease paper usage is by printing on both sides of a page. Students will gladly print double-sided, but we are not provided with the means to do so. Purchasing a high quality, duplex printer could save the school money in the long- run because they would be saving printer paper. If double-sided printers are purchased, the school would need to advertise the new characteristics because students would not be aware that the printers would have that capability. I learned that printers in the library were at one time capable of duplex printing. One of the reasons the printers are no longer duplex is because students would accidentally print double-sided, which they then complained about to administration. In order to improve awareness, IT could design a pop-up window that requires students to OK printing double –sided, which would reduce the chance this accidentally happening. How much could we save if the printers were switched to duplex printers? A standard, commercial, duplex printer ranges in price from $400-$700. Assuming we are still saving 364 reams of paper and one case

(of 10 reams) costs between $29 and $32, we can save $1,073. If we replace 10 printers with $500 duplex printers, the cost of the printers will be offset with paper savings in 5 years. The cost could be offset even faster if administration and faculty are also on board with decreasing paper.

Within the procurement plan, I would also suggest that the school aim to make the purchasing of paper more strict by requiring the paper to contain a minimum of 30% post-consumer content (recycled content). This would reduce their 'paper footprint' significantly considering the paper they purchase now contains no post-consumer content. This would have to come into play by changing the purchasing guidelines set by the college. The business associates that are purchasing goods for each department are not currently held to any standard when buying paper. If paper were required to contain at least 30% post-consumer content, then the business associates would have to look for a new source of paper. After hearing from Patrick Hunt, our contract with a paper supply store may have a separate green buying area on their website. If this is the case, the business associates doing the buying could simply use these as paper purchasing guidelines.

One of my main goals of this project was to reduce the default margins of Microsoft on student used computers in the library, increasing the usage of each sheet of paper. I contacted Michael Gass, the director of Information Technology, who informed me that there is no central way to decrease the default margin width on the computers available to students. IT would need to access each student's account, then manually reset the margins. This is unfortunate because this one simple change could have greatly affected the amount of paper used. One interesting idea is to set up orientation materials for new students to change their computer settings during their first week here. Including these steps during student's orientation would introduce green

practices within their first few days on the St. Mary's campus. By introducing these practices early we can begin to instill sustainable practices throughout student's time here.

Outcomes: The procurement group has done a lot of work on improving the procurement practices of St. Mary's College of Maryland. Pat Hunt seemed very interested and invested in increasing the number of sustainable products we purchase and encouraging all business associates that are doing the purchasing to look for greener options. Presenting in front of stakeholders and having them agree with us made me feel like the work we did was beneficial. By bringing this to their attention, we can hopefully make a meaningful impact on the future of St. Mary's. Pat Hunt will also be using some of our slides during his presentation to the business associates in order to encourage them to buy greener goods.

  I learned a lot about the way operations are run at an institution and they're not at all how I imagined. I pictured one central location that controls the purchasing for every department, but what I found was a mass of people buying and no central way to control what they were buying. This applies for paper purchasing as well as other supplies. Purchasing for an institution is a huge operation that includes a lot of players. If there was one centralized location for them to go to find "recommended" items, they would at least have a guide for things to look for (such as green-seal certified, post-consumer, recycled, etc.).

  I also learned that a lot of people are skeptical of recycled paper because they are afraid it will jam in copiers. During the symposium, I was asked three or four times if recycled paper causes paper jams more often than non-recycled paper. I had personally never heard this dilemma, but it is apparently broadly believed. Since then I have done research and there have

been multiple studies done proving that recycled paper causes no more paper jams than non-recycled paper.[8]

Throughout this process, I realized the miscommunications between students and teachers regarding what professors preferred. When printing out my St. Mary's Project, I wasn't sure if my professor preferred single-sided or double-sided so I printed single-sided. This document that is 60 pages long was printed using 60 sheets of paper rather than 30 because I wasn't sure what she preferred. Having had this insight, I now understand how imperative it is that students and professors communicate regarding the environment and personal preferences. Shifting people's habits is very difficult.

Typically, people are resistant to changes make them do more work than they have been. This is totally understandable, since a lot of the people working here are swamped with a million different things they need to get done. When a new way of purchasing something requires that they spend time searching rather than clicking and buying, those people are going to be resistant.

Conclusions: Paper reduction has an incredible number of benefits, including reducing the school's carbon footprint, the number of trees cut down, the amount of water and chemicals used in paper production, and saving money. In order for paper reduction to be successful everyone has to be on board. It's difficult to get people to see the whole picture of environmentalism: that everything you do has far-reaching impacts that are much greater than simply your surrounding environment. The paper that we are buying is most likely not coming from trees that have been cut down in Maryland; they might be cut down in California then processed in Chicago and eventually shipped to Maryland for retail. When thinking about goods purchased it is important to see the whole picture. This is one of the reasons that environmental education should be

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[8] Availability, Performance, and Cost of Recycled Paper: A study by the Division of Pollution Prevention and Environmental Assistance, North Carolina DPPEA, 2005.

required for students at St. Mary's. Moving in a more sustainable direction requires environmentally conscious citizens and this process starts with education. Within this education is an overall theme of reduce, reuse, recycle. While recycling has been the main focus in recent years, it is time for this scope to shift. We need to look at reduction in the use of resources in our everyday lives.

Recommendations: There are a lot more ways to decrease paper than I have talked about. One way that Boston University was able to substantially reduce the amount of paper used by their institute was by implementing paperless pay-stubs. By emailing the employees their direct-deposit slips rather than printing them out, they were able to save thousands of dollars' worth of paper.

Another idea is to remove each department from junk mailing lists. I'm assuming that a school, such as St. Mary's College, receives tons of junk mail that is simply thrown in the recycling bin or trash can. There are simple ways of removing the name of the department or professor from the mailing lists, which will ultimately reduce the amount of paper coming into the school and reduce collection costs if the decrease is significant enough.

One other system of the school to look into is the memo system. Switching professors and departments over to a completely paperless memo system would benefit the department and the professors. It is more convenient to simply type up an email than to print or write and walk it to their door. In this manner, professors can keep track of their conversations online without having to use paper. This saves their department money which they can put towards other things they need.

Along with paperless memo systems, an online bulletin board could be a great use of resources, where students could post goings-on, items for sale, fundraisers, etc., without having

to print actual flyers. Several schools and business have implemented such as system and it has worked beautifully. I know the World Bank has an online bulletin board that the employees use to advertise things and sell items such as cars and bikes.

St. Mary's is taking positive steps toward decreasing its carbon footprint; however we can do better in terms of paper purchasing and use. It is difficult to address the systematic uses of paper, but it is certainly those deeply rooted systems that need to change, such as paper filing systems that require emails be printed out. These systems are redundant and wasteful, but they are the hardest to change. My goal was to address wasteful practices of the students, even though all parts of the St. Mary's community need to be addressed. I hope that printers and paper will change in the years to come and we will continue to become more sustainable.

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Print Smarter, Save Trees (and Money)

1. Decrease the margins!
    (Page Layout→ Margins→ Moderate)
2. Make sure you're printing the right thing the FIRST TIME.
3. Alternatively, ask professors to accept assignments via Blackboard.

Appendix

Figure1. Example of what I may put up at each library computer to remind students to print smarter.

Letter to Staff:

Good Afternoon,

I am a student in ENST 450: Applied Sustainability Practicum. This semester my project is to reduce paper use at St. Mary's College of Maryland, primarily by encouraging the use of Blackboard as well as double sided printing. St. Mary's students are clearly dedicated to satisfying professor requests; we hope that you will use this opportunity to tell your students that

saving paper is important to you. I am writing to request that you encourage your students to save paper and to utilize Blackboard to the fullest extent possible.

You can also play your role to reduce paper use at Tufts by:

- Encouraging other faculty to do the same

- Talking about paper use at your next staff meeting

Thank you for your support.