

Green FSC: Creating a Sustainable Campus

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Abstract:

Colleges and universities account for more than 1.5% of US total annual emissions: understanding how individual institutions can become more sustainable is critical in tackling the existential threat of global climate change (Klein-Banai and Theis, 2013). Institutions of higher education from Elon University to Florida State University have established Offices of Sustainability dedicated toward reducing the campus' environmental impact. In embracing the Frank Lloyd Wright-inspired relationship between humankind and nature, through evaluation of electricity consumption and environmental curricula, Florida Southern can adopt a plan for improving campus sustainability that allows her to join a diverse cohort of schools who have already done the same. After reviewing 14,000+ electric bills over four years, FSC has released approximately 449,045,367.8 lbCO₂. On a yearly basis, the cost to offset these emissions would be slightly more than \$500,000. Emissions must not be the only factor in improving campus sustainability. Holistic sustainability requires review of environmental curricula for all students. After researching sustainability and requirements for Environmental Studies majors at Pomona College, Middlebury College, Elon University, and Rollins College, recommendations for reformation of the Environmental Studies major at Florida Southern have been provided. Short-term prospects include creation of environmental economics, policy, communications, and capstone courses and long-term prospects include envisioning an administrative and academic Office of Sustainability that can oversee all aspects of sustainability. Most importantly, if sustainability projects are to hold a legacy on any campus, there needs to be a coalition of active student environmentalists to continue the push toward green progress. After consulting student environmental leaders, an outline for an ongoing and coordinated sustainability campaign on campus has been drawn.

Introduction: A Sustainable University

“Our house is on fire.” Fridays for Future. The Sunrise Movement. The Global Climate Strikes of September 2019. Students across the world are rallying together to demand climate action. For generations, climate change has been recognized as an intimidating threat, yet substantial, preventative climate action has not been executed. There is discord on how states should approach the climate crisis domestically and internationally. In the United States, more than 15% of Americans believe climate change is a hoax (Milman & Harvey, 2019). On an international scale, commitments to climate action are being reversed. President Donald Trump has begun the withdrawal process from the Paris Agreement, making the United States one of three countries not to be beholden to this monumental, unanimously-consensual, environmental treaty (Tollefson, 2019). It has become clearer and clearer that climate action must be demanded when governments ignore the science and sacrifice many of the most vulnerable global citizenry at the hands of environmental catastrophe. As the greatest stakeholders in the health of the environment, young people, especially college students, are leading the charge in advocating for emissions reductions and sustainable practices.

In recognizing how youth prioritize sustainability, many institutions of higher education are readily practicing or attempting to practice environmental leadership. Not only are these schools simply doing the right thing by trying to minimize their environmental impact, but it’s a feature that students are deeming more and more important and necessary. When environmental education and sustainability are integrated into schools, there are many tangible benefits as well, including reduced absenteeism, higher teacher retention, improved community image, and savings on operational costs (“Why Sustainable Schools,” 2018).

So, what is a sustainable university? According to “Sustainable university: what can be the matter?”, a sustainable university is

“a higher educational institution, as a whole or as a part, that addresses, involves and promotes, on a regional or global level, the minimization of negative environmental, economic, societal, and health effects generated in the use of their resources in order to fulfill its functions of teaching, research, outreach and partnership, and stewardship in ways to help society make the transition to sustainable lifestyles” (Velazquez, Munguia, Platt, & Taddei, 2006).

A sustainable institution has four key tenets: sustainability on campus, outreach and partnership, research, and education (Velazquez et al., 2006). While this definition serves as a fundamental understanding of what sustainability should mean for higher education initiatives, each college needs to define its own mission of sustainability and what type of stewardship the school would like to lead. One sustainability project cannot encompass all four tenets of what a sustainable education institution should be. Practicing sustainability is a long-term and holistic commitment that colleges cannot seek to achieve with a one-time, short-term improvement.

Many universities across the United States and the world have promised to grow sustainability on their campuses. Over 670 universities are signatories to the American College and University President's Climate Commitment (ACUPCC) (Klein-Banai & Theis, 2011). This agreement requires schools to develop comprehensive plans to achieve carbon neutrality. ACUPCC signatories represent more than 30% of American higher education enrollment; their fulfilled commitments would reduce annual greenhouse gas emissions of the United States by 0.6% (Sinha, Schew, Sawant, Kolwaite, & Strode, 2012).

Even though Florida Southern College is not party to this agreement, FSC is making progress toward sustainability. The FSC Student Government Association (SGA) has been the most galvanizing factor in improving the environmental infrastructure of the school. SGA has brought more recycling bins to campus, replaced plastic straws with paper straws in Tutu's Cyber Café, and installed many water bottle refill stations throughout campus. Many student organizations have also attempted to bring increased environmental consciousness to campus. Organizations like flosoco, TriBeta, and TriRho have had plastic bag and plastic bottle drives, days of action for conservation, beach clean-ups, and other similar events. Student organization ENACTUS has featured several environmental campaigns for Lakeland and FSC alike.

Notably, almost all of the sustainability initiatives on campus have been from student organizations, not through the institution's administration. While student involvement is welcomed, FSC should be on par with higher education institutions of similar prestige and size: major change needs to be addressed and implemented on an institutional, administrative level. The North American University Climate Change Coalition includes schools as near as University of South Florida to be partners in accelerating local and regional climate action ("University Climate Change Coalition (UC3)," 2018). Even small liberal arts colleges, like Bowdoin College, have developed sustainable development plans and even achieved carbon neutrality

(“Carbon Neutrality”, 2018). Elon University (an aspirant school) has crafted a Sustainability Master Plan (“Sustainability,” n.d.). Many schools have entire departments and offices dedicated to tracking, assessing, and implementing environmental action. These offices both seek to address an institution’s environmental challenges on an administrative level and organize students to grow environmental awareness and action in their respective communities.

As higher education institutions recognize the importance of retrofitting sustainability into campus design and operation, there must be guidelines shared across Offices of Sustainability to ensure equal standards in evaluating the level to which the school is sustainable (i.e. where the school is succeeding and where it’s not). To fit the needs of this standardization, the Association for the Advancement of Sustainability in Higher Education has developed the Sustainability Tracking, Assessment, and Rating System (STARS). Over 1,000 institutions are STARS participants and are assessed along five categories: academics, engagement, operations, planning and administration, and innovation and leadership (“STARS Participants & Reports,” 2020). Not only does this program include information on how to track electricity consumption and other greenhouse gas emissions, but it also includes a holistic approach to sustainability including water conservation, waste reduction, environmental justice, and what sustainable curricula should look like (Durr, 2020).

Florida Southern is not yet a STARS participant, but reviewing its guidelines or considering becoming a participant would be an excellent first step in understanding how to begin making the campus sustainable. Without being a participant of university climate or sustainability commitments or associations, frankly put, Florida Southern still has a long way to go to equal sustainability initiatives underway at comparative schools. As youth increasingly prioritize fighting the climate crisis as the most important issue of our time, sustainability may even be an increasingly key factor during the high school college application and decision process; from a marketing perspective, to address the priorities of prospective students, FSC must be more environmentally conscientious. **This thesis seeks to address how FSC can begin sustainable development in three parts. I seek to**

- 1) assess FSC’s carbon footprint based off of electricity consumption data**
- 2) evaluate how the school comprehensively integrates sustainability into curricula.**
- 3) provide a roadmap for this work to be continued through organizing student groups to continue this campaign.**

Key Findings Per Thesis Objective

- 1) Assessing FSC's Carbon Emissions Footprint and the Cost of Offsetting It
 - a. FSC is consuming more electricity and releasing more carbon emissions over time, modeled by the equation $y = 1,324x - 2.63E6$.
 - b. FSC is responsible for 449,045,367.8 lbCO₂ emissions between January 2015 and April 2019 as a product of electricity consumption.
 - c. Reducing FSC carbon emissions should focus on
 - i. Improving energy efficiency
 - ii. Offsetting emissions, which could cost ~\$2.1 million
- 2) Evaluating the Integration of Sustainability into Curricula
 - a. The Environmental Studies major needs to be reworked to be more interdisciplinary
 - b. An Office of Sustainability should be established to
 - i. House the new, more interdisciplinary Environmental Studies major
 - ii. Coordinate sustainable practices with existing administrative bodies
 - iii. Oversee student engagement in campus sustainability
 - iv. Build sustainable partnerships and projects with local, state, national, and international programs
- 3) Building a Student-Led Campaign to Advocate for Campus Sustainability
 - a. Student organizations' sustainability initiatives should be coordinated together, with specific quantifiable and qualifiable campaign goals
 - b. All interested parties, including students, faculty, and staff should be party to the discussion of how to improve campus sustainability
 - c. Promoting education and awareness surrounding campus sustainability should be the top campaign priority before demanding action

Part I: Assessing FSC's Carbon Emissions Footprint and the Cost of Offsetting It

Any educational entity's carbon emissions will come from a variety of operations, like electricity consumption, agriculture/landscaping, and vehicle fleet. While obtaining an accurate and total number for FSC's carbon footprint is important to truly understand environmental impact, this must be an ongoing monitoring and assessment process.

The University of New Hampshire in its pioneering sustainability program launched the Campus Carbon Calculator, which has now been transitioned into the Sustainability Indicator Management and Analysis Platform (SIMAP). SIMAP is multifaceted. To break down carbon emissions on scales more relevant to each college, SIMAP collects institutional data that provides a tailored interpretation of statistics of greenhouse gas emission of the school. The institutional data collected includes budget (operating, research, and energy), population (number of full-time students, part-time students, summer school students, faculty, and staff), and physical size (total building space and total research building space in square feet). This information is relevant because then we can compare our ratio of greenhouse gas emissions to full-time enrollment (GHG:FTE) to similar liberal arts colleges to see just how much work needs to be done ("Campus Calculator Home", 2018).

SIMAP breaks down calculation of greenhouse gas emissions into three different scopes. Scope 1 calculates emissions of on-campus stationary sources (on-campus cogeneration plants), the university fleet, refrigerants and chemicals, fertilizer application, and animal husbandry. Scope 2 calculates emissions of purchased electricity, steam, and chilled water. Scope 3 calculates emissions of commuting, air travel, train, taxi, ferry, rental car, bus, and other forms of transportation by faculty, staff and students; solid waste (incinerated and landfill); wastewater; and paper. Importantly, Scope 3 also incorporates offsets from composting, forest preservation, and retail offsets. Retail offsets would include investment into carbon offset projects like renewable energy, energy efficiency, destruction of various industrial gases, and/or carbon sequestration that would neutralize the release of greenhouse gasses (Taiyab, 2005).

Obtaining all of this information for SIMAP's data collection template would be ideal in order to most accurately approximate FSC's greenhouse gas emissions. However, as an individual with limited time, resources, and access, I will be working to solve emissions of purchased electricity. Electricity generation accounts for 27% of U.S. greenhouse gas emissions

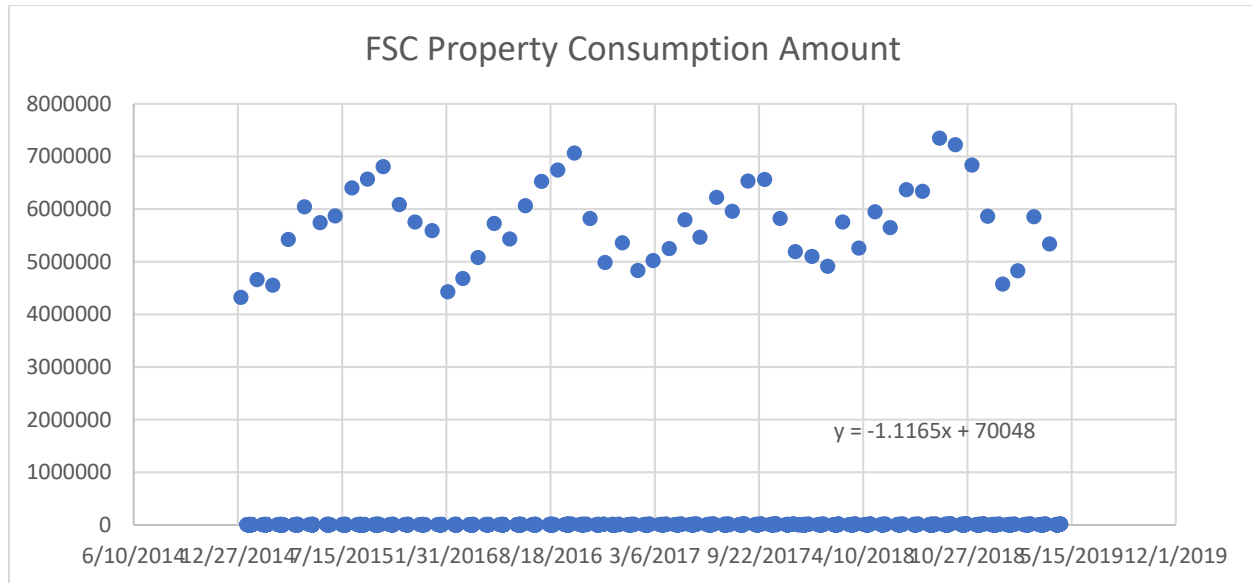
by economic sector in 2018; the economic sectors of transportation, industry, commercial and residential, and agriculture accounted for 28%, 22%, 12%, and 10% of American greenhouse gas emissions, respectively (“Sources of Greenhouse Gas Emissions,” 2019). Because Florida Southern is a college, electricity consumption is likely to be the most polluting sector of the school’s operations and thus should be used as the most relevant estimation of FSC’s carbon footprint.

To obtain information relevant to purchased electricity, I am working with FSC Director of Finance Mr. Terry Dennis. He has kindly offered me a compilation of Florida Southern’s electric bills between January 2014 and April 2019. These electric bills provide the kilowatt-hours of electricity that was generated for the school’s operation. Luckily, most of Florida Southern’s campus runs on one primary meter. However, Florida Southern also owns houses and apartments and other properties whose smaller electrical needs also need to be accounted for. While I have requested data from all apartment complexes, I requested data from 10% of college-owned houses. The average electricity those houses need for power will be generalized to the other 90% of college-owned houses and factored into the emissions of the college.

Estimating Carbon Emissions:

Information was compiled from 14045 electric bills for FSC's 37 accounts and 276 properties with Lakeland Electric from January 2, 2015 to April 24, 2019.

Graph 1: kWh of Electricity Consumed Across All FSC Properties between Jan. 2015 and April 2019.



Graph 1 plots all data points from all electric bills, but it does not take the summative value of all the electricity that Florida Southern uses for one period. Some properties use vastly smaller amounts of electricity compared to others, and this causes the huge gap in data sets. Additionally, because information for 2019 was only between the months of January and April, there is an incomplete data series. Since 2019 has not finished, the electricity consumed in this period is comparatively less to the other years. These problems make Graph 1 difficult to read and does not provide us with a helpful visualization of electricity consumption data and trends.

These problems were resolved by summing up the MWh consumed by all properties and organizing them into semiannual periods. Table 1 and Graph 2 visualize this data. Graph 2 does not include information from 2019 because the incomplete data series would skew the trendline.

Table 1: MWh of Electricity Consumed in Semiannual Periods between Jan. 2015 and April 2019.

Years	Consumption Amount (MWh)
Jan. – June 2015	32047.29
July– Dec. 2015	39071.56
Jan. – June 2016	32291.61
July – Dec. 2016	38950.55
Jan. – June 2017	33297.11
July – Dec. 2017	38088.81
Jan. – June 2018	34150.65
July – Dec. 2018	41827.04
Jan. – April 2019	21573.26

Graph 2: MWh of Electricity Consumed by FSC between Jan. 2015 and April 2019.

Consumption Amount Over Time

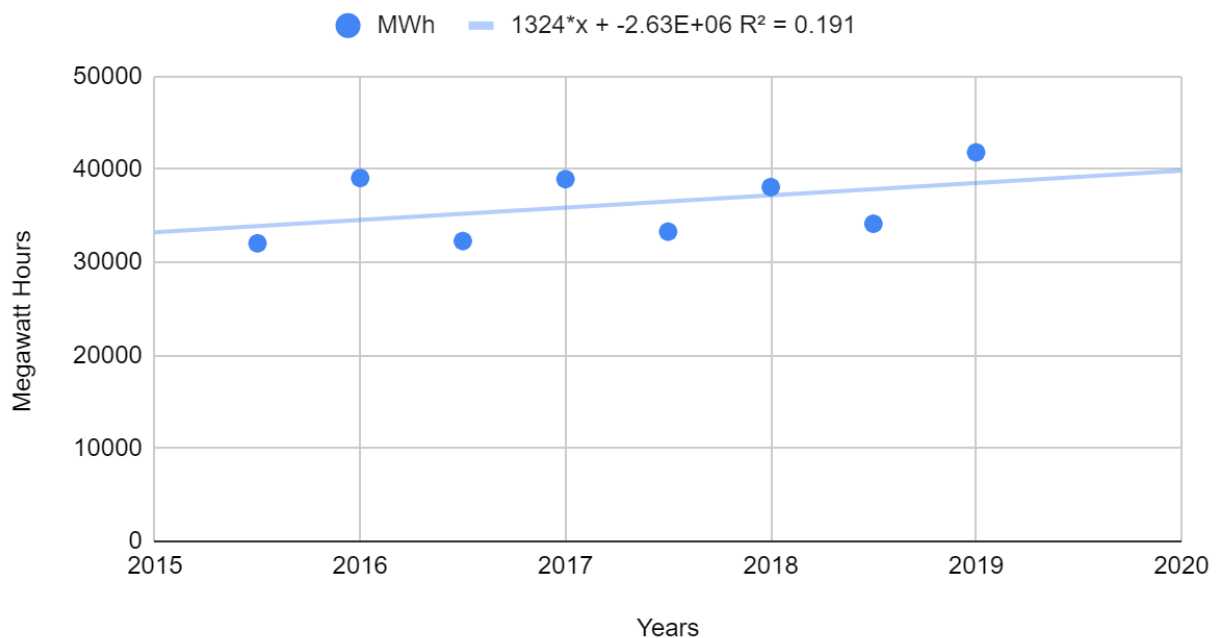


Table 1 divides MWh of electricity consumed into semiannual intervals to represent how much electricity is consumed within six months, visually represented in Graph 2. Here we can see the positive slope of the trendline, indicating that electricity consumption is increasing at FSC. This makes sense because we are constructing more buildings and housing more students. Thus, FSC's continual increase in electricity consumption means that, if the trend were to continue, FSC is responsible for the release of more and more greenhouse gasses and a greater contribution to climate change. In order to extrapolate how much electricity FSC is expected to consume in the future, use the equation: $y = 1324x - 2.63E6$. Keep in mind that extrapolation is beyond the data series, so it should only be used as an estimate given that the trend continues.

To understand how much carbon pollution this is, we need to know how Lakeland Electric sources their energy. Lakeland Electric's energy portfolio consists of coal and natural gas. Combustion of natural gas releases fewer carbon emissions than combustion of coal. Domestic natural gas combustion releases approximately 1250 lb CO₂ equiv/MWh; coal combustion releases approximately 2100 lb CO₂ equiv/MWh (Jaramillo, Griffin, & Matthews, 2007). Upon correspondence with Lakeland Electric, they source 99.99% of their electricity from three units (Units 3, 5, and 8), visualized in Table 2. Unit 3 sources from coal, and Units 5 and 8 source from natural gas; in total for 2018, 42% of Lakeland Electric's MWh came from coal, and 58% of MWh came from gas. In total, 1,445 lb_{CO2} and released per MWh. Although this number is exclusively relevant to CO₂ released, CO₂ is more than 99% of CO₂ equivalent.

Table 2: Lakeland Electric possesses 3 units that generate almost 100% of their total electricity.

Our Units 3, 5, and 8 generate most of LE's electricity (in 2018, approx. 99.99% of our total electricity was generated by these three units). On the net basis (power supply approx. 2,450 lb/MWh of CO₂, Unit 5 (gas) emits approx. 800 lb/MWh, while Unit 8 (gas) emits approx. 1,350 lb/MWh.

The table below shows the actual numbers for CY 2018:

	Unit 3 (coal)			Unit 5 (gas)			Unit 8 (gas)			Units 3+5+8		
	tons CO2	Net MWh	lb/MWh CO2	tons CO2	Net MWh	lb/MWh CO2	tons CO2	Net MWh	lb/MWh CO2	% MWh from coal	% MWh from gas	lb/MWh CO2
Jan-18	199,143	174,406	2,284	68,818	166,260	828	1,668	2,295	1,453	51%	49%	1,572
Feb-18	113,611	97,362	2,334	80,381	199,236	807	586	828	1,415	33%	67%	1,308
Mar-18	75,456	64,116	2,354	75,629	187,307	808	677	776	1,745	25%	75%	1,204
Apr-18	0	0	N/A	83,610	208,020	804	446	514	1,734	0%	100%	806
May-18	148,614	122,877	2,419	39,661	95,955	827	4,521	6,602	1,370	55%	45%	1,710
Jun-18	188,881	156,219	2,418	76,001	187,660	810	1,844	2,542	1,450	45%	55%	1,540
Jul-18	182,952	157,852	2,318	84,749	212,243	799	1,670	2,233	1,496	42%	58%	1,447
Aug-18	195,281	168,947	2,312	84,387	210,086	803	5,029	7,281	1,382	44%	56%	1,474
Sep-18	212,313	182,926	2,321	84,279	211,862	796	17,086	26,565	1,286	43%	57%	1,489
Oct-18	134,486	120,557	2,231	84,257	211,404	797	15,101	23,152	1,305	34%	66%	1,317
Nov-18	207,882	185,225	2,245	52,111	123,447	844	5,468	8,290	1,319	58%	42%	1,675
Dec-18	208,663	185,107	2,255	72,044	174,853	824	653	946	1,380	51%	49%	1,559
CY 2018	1,867,280	1,615,593	2,312	885,928	2,188,330	810	54,749	82,025	1,335	42%	58%	1,445

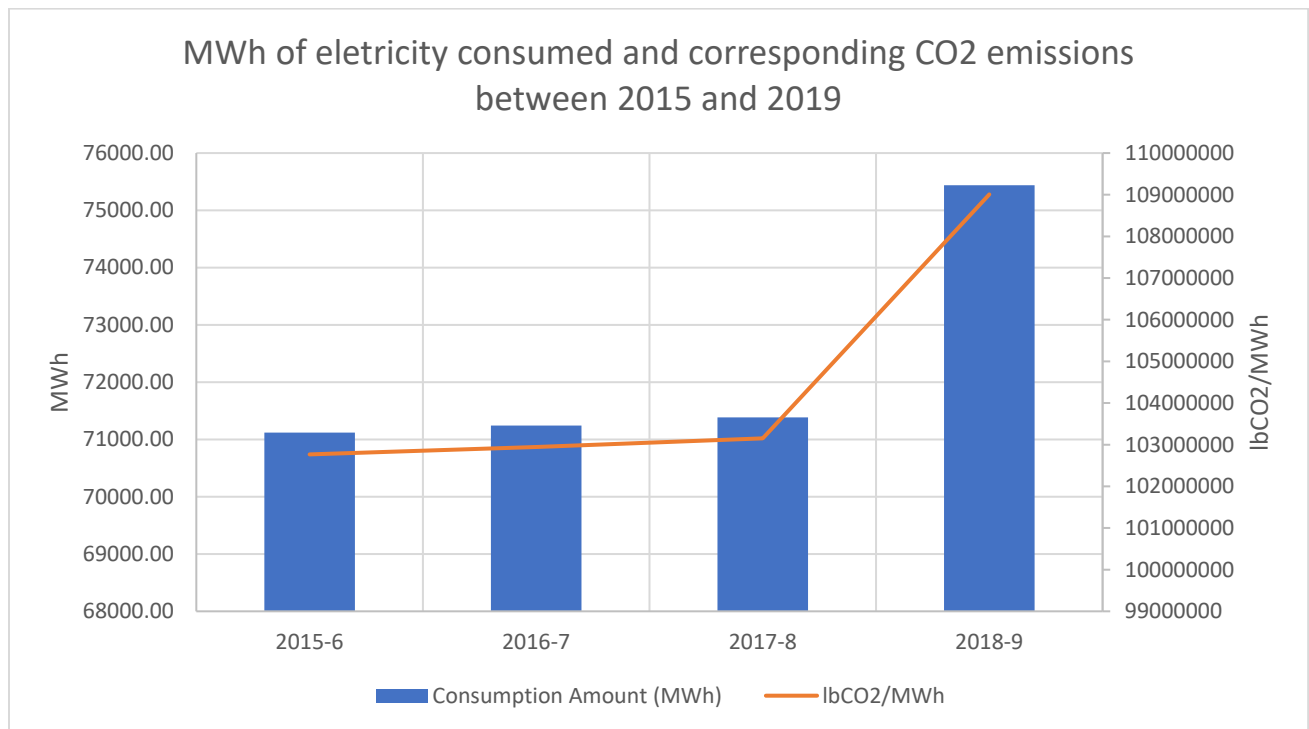
CO₂ numbers above are CO₂ only (as measured by continuous emission monitors), not CO₂ equivalent, but CO₂ is more than 99% of CO₂ equivalent.

If we assume the 2018 value for lbCO₂/MWh (1,445 lbCO₂/MWh) is the same for years 2015, 2016, 2017, and 2019, this can be multiplied by FSC's consumption amount in MWh that had been organized into semiannual periods in Table 1. Table 3 condenses the semiannual periods of Table 1 into annual periods. Table 3 shows how many lbCO₂ were emitted every year to generate electricity for FSC's properties. Between January 2015 and April 2019, 449,045,367.8 lbCO₂ were emitted. Graph 3 visualizes this relationship, supporting the hypothesis that increasing electricity consumption correlates increasing carbon dioxide emissions.

Table 3: Electricity consumption amount (MWh) and lbCO₂ released to generate that electricity between 2015 and 2019 for FSC properties.

Years	Consumption Amount (MWh)	lbCO ₂
2015-6	71,118.85	102,766,738.3
2016-7	71,242.16	102,944,921.2
2017-8	71,385.92	103,152,654.4
2018-9	75,437.85	109,007,693.3
Jan. – April 2019	21,573.26	31,173,360.7
Total	310,758.04	449,045,367.8

Graph 3: Electricity consumption amount (MWh) and lbCO₂ released to generate that electricity between 2015 and 2019 for FSC properties.



While releasing almost half a billion lbCO₂ per year may sound like a significant amount of emissions, translating these emissions into a relatable metric is difficult because of the macroscale of climate change and how much carbon dioxide is released every year. Although we cannot say that FSC singlehandedly is raising the planet's temperature by a certain number of degrees, we have evidence that FSC's operations involves an increasing carbon emissions trend when youth are calling for rapid decarbonization. FSC can limit emissions reductions in multiple ways. Two suggestions are 1) limiting electricity consumption by increasing energy efficiency and 2) offsetting emissions. Both of these suggestions may be implemented simultaneously to optimize reducing FSC's carbon pollution.

Improving Energy Efficiency:

Of course, the most obvious response to the question of how to reduce carbon pollution from electricity consumption is to decrease electricity consumption. Klein-Banai and Theis (2011) suggest examining the use of current building spaces to determine the college's educational and sustainable efficiency. In other words, is it necessary and how can we improve it? This question is unique to Florida Southern. Considering the thirteen Frank Lloyd Wright buildings that we have on campus, they were not built with functionality and efficiency in mind, which likely plays a role in how inefficiently they consume energy. For example, Polk Science is already going to consume more energy because scientific laboratories require more energy. Not only does Polk Science intrinsically require more energy, but its poor design accentuates how much of that energy is wasted. Many students may have noticed this when they try to open or shut doors in the main building of Polk Science, and a vacuum is created. There is an imbalance in how much air is leaving Polk Science because of what is being vented through the chemical fume hoods. This imbalance means lots of air conditioning is being wasted, and wasted air conditioning costs lots of money and energy. Analyzing the energy efficiency and strategizing sustainability implementation plans will be necessary for Frank Lloyd Wright buildings like Polk Science.

Additionally, many of FSC's appliances are likely energy inefficient. Originally in this thesis, I was planning to audit the campus' appliances and other technology and then conduct a cost-benefit analysis to replace existing appliances with energy efficient appliances and tech. Unfortunately, COVID-19 has limited my ability to walk through campus and identify what can be updated. However, knowing FSC and seeing many energy inefficient technologies and appliances, I am sure there is ample opportunity to replace old HVAC systems and incandescent lightbulbs with more energy efficient products. Not only does it lessen carbon pollution because electricity consumption is being limited, but it also saves money because less electricity is being used. While there may be short-term cost associated with buying new, energy efficient products, these products save money over their lifespan.

The Cost of Carbon Offsetting:

The second suggestion of offsetting FSC's emissions would involve paying for some service to prevent emissions from being released somewhere else or to sequester carbon from the air. There are nonprofits and businesses who provide carbon offsetting services, like Cool Effect. For anywhere between \$3-\$13 per ton of carbon dioxide, Cool Effect may find some type of project that effectively neutralizes how much carbon your entity may pollute (Irfan, 2020). If an organization like Cool Effect was used to offset the price of FSC's carbon pollution from electricity consumption, it would cost between \$611,050.17 and \$2,647,887.07. On an annual basis (using the most recent complete data (2018) for how many tons of CO₂ were released to produce electricity), it would cost between \$148,335.06 and \$642,785.26 every year to offset our emissions. This information may be visualized using Table 4 below.

Table 4: A cost estimation of offsetting FSC carbon emissions using Cool Effect.

Years	Consumption Amount (MWh)	lbCO₂	Tons of CO₂	Cost at \$3/tonCO₂	Cost at \$13/tonCO₂
2015-6	71,118.85	102,766,738.3	46,614.17	139,842.51	605,984.21
2016-7	71,242.16	102,944,921.2	46,694.99	140,084.97	607,034.87
2017-8	71,385.92	103,152,654.4	46,789.22	140,367.66	608,259.86
2018-9	75,437.85	109,007,693.3	49,445.02	148,335.06	642,785.26
Jan. – April 2019	21,573.26	31,173,360.7	14,139.99	42,419.97	183,819.87
Total	310,758.04	449,045,367.8	203,683.4	611,050.17	2,647,887.07

However, third-party carbon offsets have a poor track record. The United Nations has attempted to implement carbon offsetting projects. The UN's Clean Development Mechanism (CDM) was developed after the Kyoto Protocol for countries like Norway who wanted to plant forests in developing nations to offset emissions (Schwartzmann, 2018). Similar to CDM, REDD+ (Reducing Emissions From Deforestation and Forest Degradation) is a climate change mitigation solution proposed by the United Nations Framework Convention on Climate Change.

REDD+ seeks to include conservation, sustainable forest management, and enhancement of forest carbon stocks into their offsetting services (“About REDD+,” 2019). Upon an audit of CDM offset projects, 85% of offsets had a low likelihood of actually reducing carbon emissions. Even with acknowledged problems with the UN CDM, REDD+ offset projects face much of the same issue with 37% of projects being ineffectual in removing carbon pollution (Song, 2019).

Relying on potentially fraudulent carbon offsetting projects is harmful in many ways, with the most obvious being the fact that FSC could sink money into an initiative that does not even achieve the goal of neutralizing our carbon footprint. If FSC is to take sustainability seriously, we must not let ourselves be victims of greenwashing. Luckily, we may be able to institute our own offsetting program.

Trees, through photosynthesis, can be used to offset carbon emissions. FSC could grow its own forest as an offset mechanism. With the understanding that each two-ton tree offsets seven tons of carbon dioxide, almost 30,000 trees need to be planted to offset FSC’s total carbon emissions (2015-19) from electricity consumption (Thakker, 2019). To offset our past four years of carbon emissions, we need 30,000 trees, roughly the density of half of a square kilometer. Tree density varies, but in a forest, there are 50-100,000 trees per square kilometer (Rainforest Action Network, n.d.). FSC’s campus is roughly equivalent to half of a square kilometer: if an area the size of FSC’s campus was forest, our carbon emissions would be offset. This information is represented in Table 5 below. On an annual basis (using the most recent complete data (2018) for how many tons of CO₂ were released to produce electricity), roughly 7,100 trees would have to be planted every year to offset our emissions.

Table 5: An estimation of how many trees would be required to offset FSC carbon emissions.

Years	Consumption Amount (MWh)	lbCO₂	Tons of CO₂	Trees (tons/7)
2015-6	71118.85	102766738.3	46614.17	6659.167
2016-7	71242.16	102944921.2	46694.99	6670.713
2017-8	71385.92	103152654.4	46789.22	6684.174
2018-9	75437.85	109007693.3	49445.02	7063.574
Jan. – April 2019	21573.26	31173360.7	14139.99	2019.998

Total	310758.04	449045367.8	203683.4	29097.63
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To determine price, the average cost for an acre of land in Polk County, Florida must be identified. Because land in Polk County is sold by units of acres, the previous unit of square kilometers needs to be converted. After averaging the price of one acre from ten property values from Polk County properties listed on Lands of America, the average cost of one acre is \$16,974 (“Land for sale in Polk County, Florida,” 2019). FSC’s campus is roughly half a square kilometer, which is approximately 123 acres. One Tree Planted is an organization that plants native trees to restore natural ecosystems, recover after natural disasters, and protect wildlife habitat. They operate in many states including Florida, and each tree costs \$1 (“One Tree Planted,” n.d.). By multiplying the acreage required for 30,000 trees with the average cost of a Polk County acre and adding the \$30,000 cost of planting so many trees, it would cost ~\$2,117,802 to offset FSC’s carbon footprint for electricity consumption between January 2015 and April 2019. On an annual basis of using 7,100 trees to offset electricity consumption that year, the costs of combined acreage and trees is \$501,213.14. Both the total and annual costs were within the range of costs that would be charged by a service like Cool Effect. Not only are emissions from electricity consumption offset, but FSC may have forest property that can serve as valuable grounds for research and other classwork. Talk about engaged learning!

However, it is important to recognize that these prices will increase over time. As FSC requires more electricity, evidenced by the positive trendline in Graph 2, more carbon emissions will be released, and offsetting costs will increase. A trendline that indicates increased costs is never a happy burden for a college. This point further underscores how FSC may approach its carbon emissions in two simultaneous ways: 1) improving energy efficiency to decrease electricity consumption and 2) offsetting remainder emissions.

Until substantial steps are taken to improve campus energy efficiency, if the cost of full-time tuition is \$37,640 at FSC, it would be the cost of tuition for 14 students to offset FSC’s carbon dioxide emissions based on electricity consumption every year (“Undergraduate Tuition and Costs: 2019-2020,” 2019). Of course, it’s not as though FSC can just admit 14 more students, and suddenly we have enough money to pay for planting a new forest. Instead, this metric serves as a relatable visualization of the potential costs associated with neutralizing the carbon pollution resultant from electricity consumption.

Part II: Evaluating the Integration of Sustainability into Curricula

As STARS highlights in its five reporting categories, academics must be a vital component of campus sustainability. At FSC, academics and sustainability may be subject to reflection in two ways: 1) how well sustainability was integrated into my primary major, Environmental Studies, and 2) how well sustainability was integrated into classes outside of the major. In my time at FSC and in comparing my experience as an Environmental Studies major to Environmental Studies majors at other colleges, I noticed that there were key differences institutionally. Not only did academic material required by the Environmental Studies major differ, but I began to think more critically about how the necessary reforms required of FSC's Environmental Studies major may snowball into a larger structural change that can address how sustainability may be approached as a whole.

Before introducing larger, reformative recommendations, I would first like to introduce my critiques of Florida Southern's Environmental Studies major. The major's requirements for reference may be found in Appendix A. One of the greatest opportunities for improvement within the major is directing focus on what it means to be a well-rounded Environmental Studies student. The language Florida Southern uses in describing the major may be found below. Key phrases are highlighted.

“Our use of natural resources impacts the environment on a local, regional, and global scale. The management of these resources, and the solutions needed to overcome complicated challenges, requires broad knowledge of multiple disciplines. With the Environmental Studies major, students study important issues directly related to the consequences of human action on the natural landscape, and gain insight and understanding of governmental and economic policies and historical precedents that led us to this point. Students gain experience in methods of communication necessary for bridging the gap between disparate fields, such as research science and governmental agencies. The interdisciplinary nature of this major will equip students with an extensive and broad background to enter into a career with governmental agencies, local ecological organizations, the forestry service, or other environmental groups” (Florida Southern College Academic Catalog 2019/2020,” 2019).

While this description describes an Environmental Studies program that values interdisciplinarity, at Florida Southern, the core requirements of the major are all science-based. An understanding in science is an absolutely fundamental requirement for anyone graduating with an Environmental Studies degree. However, if a social, interdisciplinary approach is critical to the major's design, as can be noted in the highlighted phrases of the language of the major, a social, interdisciplinary approach deserves to be more intentionally integrated into the very core of what classes are required.

Currently, our majors take classes in departments outside of STEM as long as they fit the "16 credits outside of the natural sciences" requirement of the major (Florida Southern College Academic Catalog 2019/2020," 2019). Oftentimes the connection to environmental studies or sustainability in those classes is lacking. In my memory, the only classes that have intentionally mentioned environmental issues outside of the Biology Department is only Dr. Baumann's biannual environmental policy class (it must be noted that Dr. Baumann is leaving FSC May 2020). Without more specific attention, the ability for a class that can be intersectional to the environment is limited, with the onus on the student in being intentional in shaping relevant coursework. This can further inhibit the capacity for a student of the major to grasp the interdisciplinarity of being a successful environmental student.

Recognizing the origin of the Environmental Studies major brings insight into why the major is structured the way that it is. As students majoring in Biology developed career paths outside of pre-health and struggled in classes like Organic Chemistry, the Environmental Studies major was created as an alternative path to them. As a result, the coursework required by the major is inherently heavily biological. Even with the biological focus of the major, in conversations with Environmental Studies students at different colleges, comparing what I study to what they study, there seems to be an important biological concept that is emphasized much more in their studies: climate change.

I have learned about climate change (as a focus of the week's lesson) for at most six weeks total in my time here at Florida Southern in classes Environmental Issues, Introduction to Marine Biology, Ecology and Evolution, Biology of Amphibians and Reptiles, and Oceanography. Oftentimes, these classes reviewed the same information with little to no information that was not related to biology. My friends at other institutions have taken full-term classes about climate change. Importantly, many of my friends who are studying other fields

have had the option or been required to take a class about climate change. Considering the interest in studying climate change and the way in which climate change serves a security, social, political, economic, human rights, and generally existential issue, lessons surrounding climate change need to be coordinated between faculty and courses in a way that is much more interdisciplinary.

With growing interest in the Environmental Studies major, the major needs to be reformed to address the relevant components to which the major should actually be designed. Especially with Florida Southern undergoing its Quality Enhancement Plan (QEP) review, there is unprecedented opportunity for the major to be redesigned in a critical and visionary way. Engaged learning, as a vital facet of curricula at Florida Southern, requires students and professors to understand and apply material beyond a lecture format. Research, as a burgeoning resource provided to FSC students, allows students to create methods to solve real-world problems. By creating a dynamic, interdisciplinary, and problem-focused sustainability program at Florida Southern, students in the program could be given the opportunity to apply their knowledge in a unique and critical way that neatly fits the education that FSC seeks to provide its students.

A Meta-Analysis of Environmental Studies Programs at Institutions Beyond FSC

To understand how FSC can reform the Environmental Studies major, I reviewed what the Environmental Studies major requirements looked like at other colleges. I chose Pomona College, Middlebury College, Elon University, and Rollins College for my review. All schools are roughly the same size in terms of student population. I chose Pomona and Middlebury because their environmental academics are widely hailed as the best programs in the country. I chose Rollins and Elon because these schools are aspirant according to FSC Admissions, and they serve as the grade to which we compare our own overall institutional performance. In reviewing their major requirements and implementation, we can glean how we can reshape our program at Florida Southern.

Pomona College:

The Environmental Analysis major has required classes across five different colleges. There are only three core classes that students of the major need to take: Intro to Environmental Analysis; Environmental Justice or Nature, Culture, and Society; and Environmental Science. Along with these core classes, students pick a pre-designed course path in the following: Sustainability and the Built Environment (Sustainable Development); Environment and Society; and Environmental Science. Each of these paths have 7-11 required classes. To graduate, students take a senior seminar class where they work in teams for a client on a sustainability project (“Environmental Analysis,” 2019).

Middlebury College:

Their Environmental Studies Major requires four introductory classes for all majors: Natural Science and the Environment; Conservation and Environmental Policy; Nature’s Meanings: The American Experience; and Geography with GIS. Each major may choose a focus, of which there are four: arts, humanities, natural science, or social science. Each focus has four sub-foci. There are 7-8 courses in a focus area. Beyond taking the core classes and the classes of the focus, students are required to take two environmental cognate courses (courses outside of the chosen sub-focus) and a senior capstone experience. Senior capstone projects include book

reviews, river chemistry research, an analysis of politics of MPAs and fisheries access, and a critique of American environmental history. Middlebury touts strategic partnerships with Audubon Society, the Nature Conservancy, and the Joint US-China Collaboration on Clean Energy for student internships (“Environmental Studies Requirements,” 2018).

Elon University:

Elon offers three separate majors: Environmental and Ecological Science; Environmental Studies; and Environmental and Sustainability Studies. Curricula of these majors is delivered from faculty across 12 different departments at Elon. The Environmental and Ecological Science major features a population biology requirement, two technical courses (e.g. GIS, chemistry, physics, statistical modeling), two courses from social sciences and humanities, and four courses from ecological processes. The Environmental Studies major features economics and environmental policy requirements, two courses in environmental values in communication, four courses in policy, planning, and management, and two courses in science and analysis. The Environmental and Sustainability Studies is an A.B. degree with a focus on understanding the transformation of the relationship between humans and nature. There are three concentrations: responsible design and building arts, sustainable food production, and human ecology. Students must take one course in each of four pillars. The pillars are humanities, social science, natural science, and landscape sustainability (“Environmental and Ecological Science B.S.”, 2019; “Environmental and Sustainability Studies A.B.”, 2019; Environmental Studies B.S.,” n.d.; “Majors & Minors,” n.d.).

Rollins College:

Rollins’ Environmental Studies major features six core courses: Geosphere (understand interactions between climate, landforms, water, ecosystems, and soils), Environmental Crisis, Conservation of Biodiversity, Environmental Planning (urban growth and natural resource management), Senior Seminar, and Biosphere (scientific concepts used to study and assess ecosystems). Students in the major must also take a class in Origins of Environmental Thought (course offerings include Environmental Literature, National Parks and Protected Areas, and American Environmental History). First-year students are invited to participate in a faculty-led

field study in Costa Rica. Unlike the institutionalized offices of sustainability at the three previous schools, sustainability at Rollins is almost completely student-led. Rollins also offers a minor in Sustainable Development (“Department of Environmental Studies,” n.d.; “Environmental Studies,” n.d.; “Environmental Studies Major,” 2019).

Following a review of what Environmental Studies programs look like at comparable or aspirant institutions, at this juncture, I would like to identify the short-term and long-term standards for the Environmental Studies major.

Short Term:

First, we can identify classes that can be struck from the core requirements of the Environmental Studies major. BIO 1500 (Biological Essentials), CHE 1111 (Principles of Chemistry I), CHE 1112 (Principles of Chemistry II), BIO 2320 / 3710 (Microbiology), MAT 2022 / 2032 (Biostatistics), and BIO 3301 (Field Ecology) are not classes that have material similar to the core requirements of any of the aforementioned schools. I am unaware of the material taught in BIO 1501 (Current Perspectives in Biology), but this may be reformed to be an interdisciplinary approach to climate change. BIO 2200 (Environmental Issues), BIO 2500 (Ecology and Evolution), and BIO 2900 (Conservation Biology) all involve relatively similar scientific concepts; these classes may be able to be condensed into a singular environmental science class.

In emphasizing the liberal arts approach to building a well-rounded student of the environment, I believe core major requirements include classes on environmental economics, environmental policy, science communication, personal sustainability, a senior capstone, and an internship. The only class that FSC currently offers is POS 3330 (Topics in Public Policy: Environmental Politics). The biggest challenge at FSC will be finding faculty to create these courses. Fortunately, at many schools, including at Elon, there is a monetary incentive: faculty can apply to be part of the Sustainability Faculty Scholars Program where they modify courses to include a sustainability component. They receive a \$1,000 stipend to teach these courses. This could look like a \$4,000 budgetary allocation by the Biology Department, College of Arts and Sciences, or the Provost. Professors like Dr. McHugh (Political Science), Dr. Mackie (Communications), Dr. Ross (Business), and Dr. Macrander (Marine Biology) could be prospective leads for teaching these classes. Brief recommendations for the subject matter of these classes are listed below:

- An environmental economics class should examine a green and blue economy, the cost of renewables and nuclear, and should discuss a circular economy.
- An environmental policy class should review how policy is created, how rules evolve, and review the history of domestic and international environmental policy. This class has existed at FSC previously. Dr. Baumann's Environmental Politics and Policy syllabus is

attached to Appendix B for reference and serves an excellent example of the subject material of such a class.

- A science communication class should hone presentation and public speaking skills for students and can also serve as a review of American environmental history and rhetoric.
- A personal sustainability course could include student-led projects around campus that involve improving sustainability of the campus as well as encouraging sustainable behavior among students. This class could also serve as a precursor to the senior capstone.
- A senior capstone should permit students to develop a project with a local client or other personal project that improves sustainability or solves an environmental problem in some identifiable qualitative or quantitative measure.
- Internships can be coordinated through a student's advisor or the Pre-Health and Science Advising Center with Lauren Albaum.

An idea for consideration could be an environmental philosophy class. This could review different philosophies that link humans and nature. At Florida Southern, this connection between humankind and nature is further emphasized by Frank Lloyd Wright architecture. Frank Lloyd Wright's key design principle was blurring the lines of what is inside and what is outside. Examining environmental philosophy with a Florida Southern, Frank-Lloyd-Wright-inspired lens could bring a unique perspective that would foster an attitude of sustainable development and connection to community. This class could be a term course that could serve as a Meaning and Value general education requirement that other majors would be interested in as well.

Discussing major requirements necessitates ascribing credit values to courses. Non-capstone classes could be four credits. The capstone could be eight credits, spread over two semesters considering the long-term nature of a potential partnership with a local client. In total, with classes in environmental science, special topics (climate change), environmental economics, environmental policy, science communication, personal sustainability, a senior capstone, an internship, and an environmental philosophy class, the core major requirements would be 40 credits.

At this moment, to graduate with an Environmental Studies major, a student must earn a total of 124-129 credit hours. The total credit hours are broken down as follows: 40 general

education credits, 68-69 major requirement credits, and 12 Bachelor of Science degree requirements or 20 Bachelor of Arts degree requirements. My suggested reforms would only apply to the major requirement criteria. My suggested classes above qualify for 40 credits. If FSC is to keep the number of major requirement credits at 68-69, the question of how the remaining 28-29 credits may be earned may be resolved easily.

Because Environmental Studies is a field where there can be different concentrations, course paths or concentrations could be developed along foci like science, economics, policy, communication, philosophy, or other foci. To become specialized, students could choose 28-29 credits-worth of classes within a focus and earn a concentration certificate in a focus like science or philosophy. Not only is this a way for students to truly approach the interdisciplinarity of a well-rounded Environmental Studies major, but foci and concentrations are offered within the environmental majors at Pomona, Middlebury, and Elon.

While these suggestions may provide structural academic changes, they are confined to changes to one major. Recognizing the need for major institutional reform in how the school addresses sustainability, the prospects of an evolving sustainability-academia partnership should be considered.

Long Term:

The Environmental Studies major is nested inside the Biology Department because of its origin story. However, as this major grows into a truly interdisciplinary reflection and recognizing the different career paths that someone with the major could adopt, the association of the Environmental Studies major with the Biology Department may not be entirely appropriate or relevant.

Considering the way in which schools like Pomona, Middlebury, Elon, and most larger schools have instituted their own Office of Sustainability, Florida Southern, following the trend, should develop one of her own. While I have attempted to perform some of the work that an Office would do, schools with existing Offices of Sustainability have multiple fulltime employees who can provide a more comprehensive analysis of campus sustainability. Infrastructure beyond electricity consumption like agriculture and vehicle fleet must be assessed and reformed for FSC to be truly sustainable, which will require greater time and financial investment. Considering the role that Community Living, Guest Services, and Facilities play in creating a sustainable campus, an Office of Sustainability would serve as a stable and communicative partner for instituting meaningful and intentional change.

An Office of Sustainability could also be a very positive student resource. With several environmental groups on campus and a Sustainability Committee of Student Government, having a coordinating body oversee group efforts to build environmental awareness on campus would be more productive than short-term and disjointed actions. This office could build projects operationalized by students in a more organized and professional fashion that could develop pertinent skills for students interested in joining a problem-resolution workforce. Additionally, a stable office could build strategic partnerships with local organizations and national or international NGOs and government programs that could recruit students for paid and unpaid projects. This will build FSC's involvement in the community and lift prestige and name recognition.

Not only is an Office of Sustainability a win for instituting a sustainable campus, organizing student initiatives, and bringing clout to Florida Southern, but this could also be where the academic department of Environmental Studies could be housed. Although there haven't been academic departments bankrolled into nonacademic programs before at FSC, the

potential relationship between how the academic nature of the Environmental Studies department would work and how the sustainability implementation side would work is not too different from the current way in which several academic departments are set up. The Political Science Department is affiliated with the Justice Teaching Center for Civic Learning and the Business School is affiliated with the Center for Free Enterprise. This precedent could serve as a useful example of how a dynamic and academic Office of Sustainability could operate.

Part III: Building a Student-Led Campaign to Advocate for Campus Sustainability

Both of my previous thesis objectives relied on gathering and assessing information and then making recommendations. While advising provides useful direction for the school to adopt sustainable practices, it may be at their own will. Large orchestrations of distributed organizing like Fridays for Future or the September 2019 Global Climate Strikes have demonstrated the effectiveness in rallying popular support behind youth-led campaigns. If sustainability is to be championed at FSC, we cannot depend on the will of the administration: we must depend on the power and pressure from the students.

Many colleges and universities have recognized the role that students can play in supporting sustainable practices. At FSC, much direction for my thesis was offered by Mrs. Hayley Ross. Mrs. Ross currently works for FSC's Development Office, but in her previous role, she led the University of South Carolina's Office of Sustainability student engagement programs. She worked with student leaders directly to build sustainability initiatives on USC's campus. While FSC may not have its own Office of Sustainability yet, students can still build a grassroots campaign to support an environmentally-friendly campus.

Fortunately, groups like Public Research Interest Groups for Students have campaigns that provide resources to those who want to organize for campus sustainability. After speaking with Arielle Mizrahi from Florida PIRGS about how to translate the work of my Honors Thesis into something actionable, I realized that my work would be a moot point unless I could attempt to organize a more coordinated coalition of student environmental leaders who could carry on the work of pressuring FSC to adopt more sustainable practices.

Upon this revelation, I reached out to campus environmental leaders to join a call with me and Arielle so we could determine how best to proceed with building a grassroots sustainability campaign. Arielle shared with us some campaigns that PIRGS has found successful with one being the 100% renewables campaign. This campaign urges universities to pledge to receive 100% of their electricity from clean energy by 2020. In California, CALPIRGS was so successful that the entire University of California system has pledged to run off of only clean energy by 2045, five years ahead of target ("100% Renewable Energy," n.d.).

FSC does not generate its own electricity. Lakeland Electric supplies electricity to FSC, which is their biggest customer. Pressuring FSC to pledge a clean energy promise may influence Lakeland Electric to add renewables to their portfolio, which currently only consists of coal and natural gas. While demanding clean energy for our school may be the end goal, during the group call with Arielle, the student leaders and I identified key obstacles that prevent us from launching such an ambitious initiative outright.

With sustainability initiatives in the past revolving around plastic, the administration has been relatively accommodating to student requests. For example, the school store does not provide plastic bags, and plastic straws were replaced with paper straws in Tutu's Cyber Café. Organizations like TriBeta, TriRho, flosoco, ENACTUS, and more have all promulgated their own messages about the importance of sustainability and how people can behave in a more environmentally-friendly manner.

While progress may seem apparent toward eliminating single-use plastic, the campus culture may suggest differently. This year, the Student Government Association revealed that so many of our recycling bins were contaminated with trash that recycling may no longer be a service offered to the school by Lakeland. Evidently, students are not proficiently literate on how to recycle properly. When SGA has tried to hand out reusable straws or cutlery, some students shared that they prefer to use single-use plastic because it's more convenient. In order for sustainability initiatives to be wholly successful on campus, there needs to be more educational materials that can rally them to join the cause.

In the past, each student organization has led relatively disjoint measures to tackle environmental issues facing our campus. However, organizing their efforts and networks into a more cohesive and coordinated fashion may yield greater promise. This is not a novel concept. SGA has convened Sustainability Summits with these organizations before. These summits served as an opportunity for student organizations to share information about each of their independent sustainability initiatives. By listening to the actions of fellow student organizations, maybe these groups could team together to provide a clearer, more singular initiative.

The Sustainability Summits were a great step toward building a team-led campaign. However, without directing the groups toward a clear focus, coordination between student organizations has faltered, and sustainability initiatives have more or less remained disjoint. I

believe that reviving the Sustainability Summits is a great idea, but they need to be more structured.

First, conversations surrounding sustainability need to be inclusive. Not only should student organizations who have led sustainability initiatives in the past be invited, but many students may have valuable knowledge on how to address these problems or be able to provide valuable assistance. Sustainability is not just a concern for Environmental Studies majors: everyone is a stakeholder in the health of the environment. We should encourage students from all backgrounds to want to participate in discussions like these. By doing so, we're cultivating a passionate and diverse team who will more successfully execute a well-rounded campaign.

In the spirit of inclusion, faculty and staff have wonderful advice that will further strengthen how we approach sustainability on campus. With many of them enjoying decades of knowledge on how to successfully execute complex projects such as this, their support and expertise is invaluable. Additionally, their experience at FSC, which is often longer than any student's, can provide meaningful insight into why things are the way that they are or how to get things done. Especially when decisionmakers are brought into the discussion, students need to understand what we need to provide in order to convince them to agree to the asks of a sustainability campaign. As seen in SGA's Town Halls, oftentimes the administrators are receptive to student opinions and comments. By sitting with those same administrators at the discussion table, all of us can understand how we can help them execute policy or operational changes more easily.

Because of the dynamic nature of a campaign, meeting once a semester does not provide the coordinated direction necessary for interacting pieces to communicate and reassess goals effectively. Instead, congregations of those student organizations and student leaders wanting to participate in this campaign should occur every month. Meetings should set clear goals to be executed according to three timelines: by the next meeting (within a month), by the end of a semester, and by the end of an academic year. While goals for monthly meetings may be more ambiguous, semesterly and annual goals should be quantifiable. For example, a goal set for the next monthly meeting might be to host an event highlighting how to reduce energy consumption. Meanwhile, a semesterly goal may be to have 15% of the student body regularly practicing energy efficiency practices or an annual goal may be to have 30% of the student body doing so. By setting quantifiable goals, progress can be evaluated along a clear and tangible metric.

Importantly, after discussing the campus' biggest roadblocks to sustainability with student environmental leaders, we have identified lack of awareness to be the greatest obstacle. While apathy already existed with plastic initiatives, fighting plastic is fighting an enemy that you can see. When you're advocating against carbon emissions, many students ascertain an abstract understanding of the importance of fighting climate change, but the action of doing something physical is less readily demonstrable. Because of this, a 100% clean energy pledge campaign may experience similar or worse campus apathy than current initiatives against plastic.

Because of this, before petitions may be collected or demonstrations may be organized, all parties interested in participating in a coordinated sustainability campaign should direct efforts toward education and promoting awareness. A united effort to increase campus literacy on energy efficiency and how electricity consumption contributes to climate change is more likely to build support behind anything asked of a decisionmaker than a less concerted attempt.

Of course, in educating groups of campus, key influencers must be identified. Tabling at the Buck Stop is simply ineffective in making the entire campus generally aware of such a campaign. By including Resident Advisors, faculty and staff, and those who manage social media accounts for student organizations, the reach of this educational campaign will be broader. Each of these key influencer groups serves as a liaison between those already involved in pushing the sustainability campaign and those who may not know about it but may want to get more involved. The more actively and consistently this educational material is shared, the stronger the grassroots movement will be for social and environmental change as large as a pledge to commit to clean energy by 2050.

Concluding Remarks:

Altogether, though the steps we might take as individuals to reduce our own carbon footprint may be small, when they are strung together by a network of passionate individuals ready to push for positive change, there can be a paradigmatic shift in how we, as a campus, can approach an issue as existential as climate change. While our end goal may be a carbon-neutral campus, the milestones we achieve along the way are no smaller. Every goal that we reach is a win for the environment and for our own futures. When the enthusiasm behind one person flipping off a light switch when they leave their dorm builds into dozens of students supporting each other to do the same, momentum builds. At what point will student social pressure escalate into a unanimous demand for an institutional dedication to unapologetic sustainability?

After all, if there was ever a place consecrated to be a blueprint for sustainable development, it would be Florida Southern College. I would be remiss to ignore the most iconic feature of our campus: we were built by Frank Lloyd Wright. As we all know well, Wright was a visionary architect. As you listen to the words of a passing Southern Ambassador during a campus tour, Wright's fundamental design principle was to bring the inside outside and to bring the outside inside. Wright strove to perfectly integrate the natural into his buildings. In fact, nature was so important to him that weaving elements of the outdoors into each design was an ode to God.

In Wright's 1932 autobiography, he wrote, "No house should ever be *on* a hill or *on* anything. It should be *of* the hill. Belonging to it. Hill and house should live together each the happier for the other." Since when did the relationship between campus and nature stray? Since when did the operation of the school antagonize the health of our climate? It doesn't have to.

We have an unprecedented opportunity to restore the legacy of our own college. It's for Frank. It's for the planet. It's for our future.



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Appendix A: Florida Southern College's Environmental Studies Major Requirements

Environmental Studies Major Requirements

A. General Education Requirements40 hours

B. Major Requirements68 - 69 hours

BIO 1500	Biology I: Biological Essentials
BIO 1501	Current Perspectives in Biology (FTIC only)
BIO 1600	Biology II: Biological Diversity
BIO 2200	Environmental Issues
BIO 2320	Marine Microbiology OR
BIO 3710	Microbiology
BIO 2500	Biology III: Ecology and Evolution
BIO 2900	Conservation Biology
BIO 3301	Field Ecology
CHE 1011	Chemical Foundations for the Biological Sciences AND
CHE 1013	Environmental Chemistry Fundamentals
OR	
CHE 1111	Principles of Chemistry I AND
CHE 1112	Principles of Chemistry II
MAT 2022	Elementary Statistics OR
MAT 2032	Biostatistics

28 hours selected from the following (at least 16 hours must be outside of the natural sciences; at least 12 hours must be at the 3000- or 4000-level) or other courses approved by the faculty and advisor:

Natural Science

BIO 1520	Introduction to Marine Biology
BIO 1820	Oceanography
BIO 2520	Biological Geography and GIS

BIO 3100	Plant Taxonomy
BIO 3120	Biology of Amphibians and Reptiles
BIO 3316	Tropical Ecology
BIO 3700	Genetics
BIO 4460	Introduction to Ecology Research AND
BIO 4461/4462	Research: Ecology
OR	
BIO 4560	Introduction to Molecular Biology Research AND
BIO 4561/4562	Research: Molecular Biology
OR	
BIO 4661/4662	Site Specific Research in Biology (with departmental approval)
BIO 4960/4961	Biology Internship
CHE 2231	Organic Chemistry I AND
CHE 2251	Organic Chemistry I Laboratory
CHE 2232	Organic Chemistry II AND
CHE 2252	Organic Chemistry II Laboratory
CHE 2335	Analytical Chemistry
HRT 2100	Introduction to Horticultural Science
HRT 3301	Soil Science
PHY 2010	General Physics I (Algebra Based)
OR	
PHY 2110	General Physics I (Calculus Based)
PHY 2020	General Physics II (Algebra Based)
OR	
PHY 2120	General Physics II (Calculus Based)
Outside Natural Science	
BIO 2214	Disasters, Civilizations, and the Environment
BIO/REL 3378	Dialogues in Science and Religion
BUS 2217	Principles of Management
BUS 3311	Legal Environment of Business
COM 2100	Mass Media and Society
COM 2400	Principles of Advertising and Public Relations
COM/SOC 2270	Intercultural Communication
COM 3200	Persuasion
COM 3450	Public Relations Writing
COM 4350	Public Relations Strategies
ECO 2205	Principles of Microeconomics
ENG 3200	Writing for Business
ENG 3217	Creative Nonfiction Writing
ENG 3219	Persuasive Writing
ENG 3263	Rhetoric and Writing
ENG 4209	Special Topics in Nonfiction (with advisor approval)
HIS 1300	The Modern World
PHI 2204	Ethics
PHI/REL 2219	World Religion and Philosophies
POS 1115	Methods for Political Science I

POS 2290	Current Issues in American Politics	
POS 2295	Methods for Political Science II	
POS 3323	International Organizations	
POS 3400	Political Parties and Interest Groups	
POS 3500	International Relations of the Developing World	
SPA 1101	First Semester Spanish	
C. Bachelor of Arts Degree Requirements		20 hours
<i>OR</i>		
D. Bachelor of Science Degree Requirements		12 hours
E. Electives		0–4 hours
F. Total.....		124–129 hours

Appendix B: Dr. Baumann's Environmental Politics and Policy Syllabus

POS 3330: Topics in Public Policy

Spring 2020 Topic: Environmental Policy

Spring 2020

4 Credits

Florida Southern College

Class Information

Section: 01

Class Time: Tuesdays & Thursdays, 2:00-3:45pm

Class Room: Ordway 140

Professor: Zachary Baumann, Ph.D.

Office: Ordway 132

Office Hours: MWF from 9:00-11:00am and by appointment

Office Phone: (863) 680-4962

Mobile Phone: (662) 801-7698

Email: zbaumann@flsouthern.edu

Course Description

Four Hours. This course examines the institutions and actors involved in the creation of environmental policy and the evolution of these regulations over time. Members of both the public and the government are growing increasingly concerned about a host of environmental challenges facing the nation and world. As scientists and policymakers consider how to meet rising global temperatures, arbitrate fights over the management of scarce land and water resources, and develop sustainable fuel sources, there is significant debate about the right path forward. This course will help you understand how policymaking shapes—and is shaped by—these discussions, explaining the lawmaking process, how rules evolve, and how the system attempts to balance the interests expressed through government rules with the organizations and individuals being regulated.

Course Format: Face-to-Face

Course Specific Student Learning Outcomes

Upon completion of this course, students should be able to:

1. Identify the key actors and organizations responsible for crafting environmental policy in the United States and evaluate the influence they have over the policy area.

2. Describe how environmental policy has changed in the United States, the trade-offs often confronted by policymakers, and the critical issues they now face.
3. Propose viable solutions to environmental policy problems by correctly synthesizing research, evaluating policy alternatives, and disseminating results in a public forum.

Readings

The following texts are required for this course. All other readings will be made available to you in class or online.

1. Layzer, J. A. (2016). *The environmental case: Translating values into policy* (4th ed.). Los Angeles, CA: SAGE.

Engaged Learning

Engaged learning is an approach to teaching and learning in which students are responsible for developing the skills, attitudes, and knowledge necessary for success in life. The role of the professor is to empower students to achieve these outcomes. The engaged learning method of teaching encourages learners to conduct meaningful inquiry, reflect, think critically, and develop learning strategies for dealing with real-world challenges. Engaged learning may take place in a variety of settings using approaches varying in complexity and tailored to diverse learning styles

Technology

In this course:

- Students are required to have active email accounts and know how to access and use the college portal. Students are also expected to read and post to the course Facebook page.
- Students are required to use online databases (such as Lexis Nexis and JSTor) as part of their research.
- Students will frequently present their research to the class, and will be required to employ tools such as PowerPoint, Prezi, and iMovie.

Grading

Grade Scale: A 90-100%; B 80-90%; C 70-79%; D 60-69%; F 0-59%

Your grade in the course will be determined based on the following projects and assignments:

Discussion Questions	15%
Analysis Papers	40%
Communication Strategy Project	30%
Participation	15%

Discussion Questions: On days with assigned readings, you must submit at least two discussion questions concerning the material assigned. These must be uploaded to the Portal by 10:00 a.m. the day of the lecture. Your discussion questions cannot be revised for a higher grade. A good discussion question can facilitate discussion (cannot be answered by yes/no), is answerable, and moves beyond a surface level understanding of the text (avoid questions like: "what are the three points the author makes..." or "what is the evidence the author provides to..."). Discussion questions will be worth 15 percent of your total grade and I will drop your lowest five scores.

Analysis Papers: Following class each Thursday, I will post a question to our Facebook group asking you to synthesize the material we have discussed during the week or explore a topic in more detail. Your response will be due the following Tuesday by the start of class (uploaded to the Portal). The length of these papers may vary from week-to-week, but I generally expect most questions can be answered in 3-5 pages. I will include your best 10 scores in the calculation of your final grade.

Communication Strategy Project: Over the course of the semester, you will work with other members of the class to develop a communication strategy for local leaders. In completing this assignment, you will think systematically about the information to be communicated, the stakeholders, mediums through which the message could be communicated, a strategy for implementation, and develop a plan to determine if the strategy is working. You will submit this assignment in stages throughout the semester with the final paper and presentation due during our final exam period. More information about this assignment can be found at the end of this syllabus.

Class Participation: Learning is an active process that requires you to be engaged with the material. Students who complete and think critically about the assigned readings, ask questions, and contribute to the classroom environment gain a better understanding of the material and earn higher grades. You are expected to attend every class, having completed all assigned readings and assignments and to participate fully in all activities. Your participation will be assessed twice during the semester – in weeks 8 and 15 – with your final score being the average of these grades. More information about the calculation of your participation grade can be found at the end of this syllabus.

Late Assignments & Extensions: Assignments not submitted by the appropriate date and time are late and will not be accepted. If you must miss class for an unavoidable reason (i.e. excused absence), you are responsible for notifying me before the absence takes place and must make arrangements for submitting your work early. If you know your assignment will be late through no fault of your own, please contact me to inquire about an extension. Extensions without penalty will be granted at my discretion only and should be sought at least 24 hours before the due date.

Rewrite Policy: You have two weeks following the return of any eligible assignment to revise and resubmit the document for a higher grade. Exceptions to this rule include assignments submitted during our final exam period (cannot be revised) and those returned during the last two weeks of the semester (due the last day of the semester). When submitting revisions, you will make alterations to your original document using the "track changes" feature and email me the resulting file. Finally, to be eligible to rewrite, you must submit an original document with at least a substantive portion written. You cannot submit revisions for works not turned in by the deadline posted or turned in with most of the content missing.

College & Classroom Policies

Respect: In this course, we endeavor to build a better understanding of environmental politics and policy for all students. Everyone comes to this course with different backgrounds in the subject matter and normative beliefs about the proper role of government in society. It is important that we treat each other with the utmost respect and civility. Failure to demonstrate respect for anyone in the course will not be tolerated and may result in sanctions including, not limited to, a reduction in your participation grade.

Attendance: The college Academic Catalog states the following: "Students are expected to attend all class and laboratory sessions on time and may be absent only for unavoidable documented reasons." In this class, you are permitted 2 free unexcused absences that will not count against your grade. Any additional unexcused absences will result in the loss of 1 point off of your course grade. In addition, if you are tardy more than twice in the semester, you will lose $\frac{1}{2}$ of a point off of your course grade for each additional time you are tardy. No student who misses more than 8 classes will be awarded a passing grade.

Honor Code: "I will practice academic and personal integrity and excellence of character and expect the same from others." As an academic community, Florida Southern College is firmly committed to honor and integrity in the pursuit of knowledge. Therefore, as a member of this academic community, each student acknowledges responsibility for his or

her actions and commits to the highest standards of integrity. In doing so through this Honor Code, each student makes a covenant with the college not to engage in any form of academic dishonesty, fraud, cheating, or theft. Further information on the Honor Code is available in the current Catalog.

Students with Disabilities Statement 2019-2020: Florida Southern College and Student Disability Services are committed to providing access and inclusion for students with documented disabilities to courses, facilities (including Residence Halls), and programs. Categories of disabilities could include, but would not be limited to, chronic health diagnoses, learning disabilities, and mental health conditions. If you anticipate or experience barriers to your college experience due to the impact of a disability, please notify the Office of Student Disability Services to discuss the eligibility process for establishing accommodations.

You can reach Dr. Marcie Peepichal, Coordinator of Student Disability Services, in Rogers Building Room 120, by telephone at (863) 680-4197, by fax at (863) 680-4195 or by e-mail at disabilityservices@flsouthern.edu.

For more information on disability accommodations and access, please visit our website at <http://www.flsouthern.edu/campus-resources/student-disability-services.aspx>.

Course Schedule

To the extent possible, we will strive to follow the schedule below; however, I may choose to modify any part herein at my discretion. All changes will be announced in class and posted online.

Week 1: Introduction to the Course

January 7: Introduction to the Course

- No readings assigned

January 9: How can we evaluate politics systematically?

- No readings assigned

Week 2: What is Public Policy and How is it Made?

January 14: What is public policy?

- Gormley, W.T. (1986). Regulatory issue networks in a federal system. *Polity*, 18(4), 595-620.
- Layzer & Rinfret, Chapter 1

January 16: What is the process whereby public policy is made?

- Jann, W. & Wegrich K. (2007). Theories of the policy cycle. In F. Fischer, G.J. Miller, & M.S. Sidney (Eds.), *Handbook of public policy analysis: Theory, politics, and methods* (43-62). Boca Raton, FL: CRC Press.

Week 3: How is Environmental Policy Made?

January 21: Is environmental policy important?

- Birkland, T.A. (2007). Agenda setting in public policy. In F. Fischer, G.J. Miller, & M.S. Sidney (Eds.), *Handbook of public policy analysis: Theory, politics, and methods* (63-78). Boca Raton, FL: CRC Press.
- Pralle, S. B. (2009). Agenda-setting and climate change. *Environmental Politics*, 18(5), 781-799.

January 23: What does the public think about environmental policy?

- Daniels, D.P., Krosnick, J.A., Tichy, M.P., and Tompson, T. (2012). Public opinion on environmental policy in the United States. In Kamieniecki, S. and Kraft, M.E. (eds.) *The Oxford handbook of U.S. environmental policy* (pp. 461-486). New York: Oxford University Press.

Week 4: How is Environmental Policy Made and Evaluated?

January 28: No class – You will meet informally to choose groups and develop timelines.

- Compass. (n.d.) *How to develop a communication strategy*. Retrieved from: <https://www.thecompassforshe.org/how-to-guides/how-develop-communication-strategy>.
- Catholic Relief Services. (2013). *Communication toolbox*. Retrieved from: <https://www.crs.org/sites/default/files/cra-files/communication-toolbox-template-develop-a-communication-plan.pdf>.

January 30: How do institutions impact the environmental policy?

- Lazarus, R.J. (2004). The challenges for U.S. lawmaking institutions and processes of environmental protection law. In *The making of environmental law* (pp. 29-42). Chicago, IL: The University of Chicago Press.
- Potoski, Matthew. (2002). Designing Bureaucratic Responsiveness: Administrative Procedures and Agency Choice in State Environmental Policy. *State Politics & Policy Quarterly*, 2(1), 1-23.

Week 5: How Do We Evaluate Success and Failure?

February 4: How do we evaluate the efficacy of environmental policy?

- Atkinson, G. and Mosrato, S. (2008). Environmental cost-benefit analysis. *Annual Review of Environmental Resources*, 33, 317-344.

February 6: Work on Research Project

- Come to class with questions. We will be joined by Bill Anderson, Water Utilities Director, Laurie Smith, Manager of Lakes and Stormwater, and Julie Vogel, Environmental Program Specialist.

Week 6: Is There a Need to Regulate Polluters?

February 11: Air & Water Pollution

- Layzer & Rinfret, Chapter 2

February 13: Hazardous Waste

- Layzer & Rinfret, Chapter 3

Week 7: How Can Pollution be Regulated?

February 18: Ecosystem-based management

- Layzer & Rinfret, Chapter 4

February 20: Market-based solutions

- Layzer & Rinfret, Chapter 5

Week 8: How Can Competing Values be Reconciled?

February 25: Oil vs. the Wilderness

- Layzer & Rinfret, Chapter 6

February 27: Livestock vs. the Range

- Layzer & Rinfret, Chapter 7
- **Due:** All "gathering evidence" sections should be submitted by this point

Spring Break

March 3-5: No Class – Spring Break

Week 9: How Can Competing Values be Reconciled?

March 10: Jobs vs. the Environment

- Layzer & Rinfret, Chapter 8

March 12: Recreation vs. Preservation

- Layzer & Rinfret, Chapter 9

Week 10: How Can We Evaluate Climate Change?

March 17: What is this debate about?

- Layzer & Rinfret, Chapter 12

March 19: How can we evaluate the impact?

- Readings TBA

Week 11: How Can We Evaluate Fracking?

March 24: What is this debate about?

- Layzer & Rinfret, Chapter 14
- **Due:** First drafts of all sections must be submitted by this point

March 26: How can we evaluate the impact?

- Readings TBA

Week 12: How Can We Evaluate Urban Sprawl?

March 31: What is this debate about?

- Layzer & Rinfret, Chapter 15

April 2: How can we evaluate the impact?

- Readings TBA

Week 13: How Can We Evaluate _____?

April 7: What is this debate about?

- Readings TBA

April 9: How can we evaluate the impact?

- Readings TBA

Week 14: Project Work Week

April 14: Work on Research Project

- You must attend class and work on your project—I will be available to answer any questions that may arise. You will report on your progress at the end of the class period.

April 16: Work on Research Project

- You must attend class and work on your project—I will be available to answer any questions that may arise. You will report on your progress at the end of the class period.

Week 15: Course Wrap-Up

April 21: Wrap-up and review

- No readings assigned
- **Due:** Final drafts of all sections are due

April 23: No class – Fiat Lux

- Fiat Lux memo due Friday (April 24) by 5:00pm

Finals week

April 28: Final Exam from 3:15 to 5:15pm

Participation Rubric

You will participate in this class by attending and engaging in discussions, completing in-class assignments, and adding value to our academic community. If you feel less comfortable regularly participating in class, be certain to engage with me using other mediums (office hours, discussion boards, and email) to demonstrate your ability to understand and work with course concepts and theories. The following rubric describes my expectations for each grade-level:

A = Students earning an "A" come to nearly all classes prepared and can demonstrate superior comprehension of the material. They contribute to the class conversation, but don't dominate it – they make thoughtful contributions that advance conversation, showing interest in and respect for others' views. They are demonstrably engaged in course material and content.

B = Students earning a "B" miss only a few classes, but attends having completed the readings and able to demonstrate comprehension of the readings, perhaps lacking fully integrated views toward the material. They make thoughtful comments when called upon, show respect and interest in other student's views, and occasionally contribute without prompting. They are making a good-faith effort to participate in class, but may not have the integration of ideas of an "A" student or may not participate as often.

C = Students earning a "C" miss several classes, but arrives having completed the readings and able to discuss their most basic tenets. These students do not voluntarily contribute to class and gives only minimal answers when called upon. They are putting forward some effort, but appear to be uninterested in the material and do not participate much without prompting.

D = Students earning a "D" miss close to half of the classes, and when present have difficulty positively contributing. These students do not voluntarily contribute to class, and when prompted, gives responses that may be off-topic and demonstrate a lack of knowledge or preparedness. They are putting forth less than average effort in the course and may be having a negative impact on others.

F = Student earning an "F" miss over half of the classes, and when present, cannot demonstrate they have read the material or thought about the concepts. These students do not voluntarily contribute to class and does not give answers related to the question being asked when prompted. This student does not appear to be interested in the content of the class and is putting forth a very minimal level of effort.

Communication Strategy Project

This semester, we will be working for the Lakeland Water Utilities and Public Works departments, helping them develop a communications strategy for Lakeland residents. As our community continues to grow, it is important residents understand where their water comes from, where it goes, and the impact their behaviors have on its sustainability. Lakeland has a diverse population with many distinct needs and desires. One of the goals of these departments is to better communicate with the public so people are more informed of both what their city government is doing and how they can help preserve the local water system themselves.

To complete this assignment, our class will be working to develop a communications strategy proposal for the Water Utilities and Public Works departments. Individually, you will work in a small group to tackle a portion of this proposal. Developing a communications strategy is a multi-step process requiring an understanding of what the departments are doing today, what they hope to accomplish, who they intend to reach, how these audiences will be contacted, and how they will know if the strategy is successful. You will work in a small group to tackle a portion of this proposal and compose a brief reflection at the end. It is my goal for you to present your plan to officials from these departments at the end of the semester.

The readings for class include information on developing a communications strategy. Here are the specific questions I would like a team examining (and the sections of the project you will be completing):

1. What is being done now and what are comparable cities doing?
 - a. History & Strategic Overview
 - b. Comparable Cases
2. What are our objectives and the key audiences that must be reached?
 - a. Program Objectives
 - b. Audience Segmentation
3. What is/are the message and how will it/they be communicated?
 - a. Key Messages
 - b. Communication Strategy
4. How will this strategy be implemented and how will feedback be received?
 - a. Implementation Strategy
 - b. Feedback Strategies
5. How much will this cost and how will the program be evaluated?
 - a. Budget
 - b. Program Evaluation Plan

Below is the rubric that will be used to assess your performance on this project:

Gathering Evidence	10%
First Draft	10%
Final Draft	60%
Reflection Paper	10%
Participation	10%

Gathering Evidence: One of the first steps in answering your question will be to gather the information needed. To complete this assignment, you will create an annotated list of sources, identifying items of value to your project. Organize your list into three sections: Information Found, Still Looking For, and Need to Develop. In the first section, discuss the useful information you found and plan on using in your project. In the *still looking for* section, identify the information you believe may exist, but are still trying to find. Finally, in the *need to develop* section, identify information that you would like, but would probably need to collect yourself (surveying the public, accessing administrative records, etc.). You will craft specific deadlines within your groups, but these sections must be submitted to the Portal no later than February 27.

First Draft: Submit a draft of the two sections your group has been assigned. You will be graded on the completeness of your responses, the sources you use, and the style you employ. In addition to having good ideas, it is important your work is well-sourced and written clearly and concisely. Each section of the proposal has different metrics for success; be sure to speak with me if you require further clarification. You will craft specific deadlines within your groups, but these sections must be submitted to the Portal no later than March 24.

Final Draft: Incorporate the suggestions made throughout the semester into a final draft. You will craft specific deadlines within your groups, but these sections must be submitted to the Portal no later than April 21.

Reflection Paper: At the conclusion of the project, I would like you to write a short paper containing the following three sections: What We Did, What I Contributed, and What I Learned. In the first section, discuss how your group contributed to the proposal, the information you gathered, and the conclusions you generated. Explain how you arrived at your answers. In the next section, explain how you contributed to the group. How, specifically, did you contribute to the group's success? In the final section, explain how this project linked back to concepts, theories, and readings from class. Discuss, using specific examples, how your work pertained to what we learned

throughout the semester. This assignment is due at the beginning of our final exam period.

Participation: At the conclusion of the semester, you will be asked to evaluate the participation of all other members of your group.