2013

University of North Florida Climate Action Plan

University of North Florida Environmental Center

Climate Action Plan

Version 1

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OFFICE OF THE PRESIDENT
John A. Delaney

UNF UNIVERSITY of NORTH FLORIDA.

President's Message

The University of North Florida (UNF) Climate Action Plan is a further statement of the university's commitment to environmental responsibility. At UNF, we have identified our institutional and individual "responsibility to the natural environment" as one of our core values, which guides our decisions and our practices.

In part, the university's commitment stems from our unique campus, which includes the 382-acre Sawmill Slough Preserve. This preserve serves as a home to a large variety of plant and animal species, including over six hundred native plant species. Institutions such as the Association for the Advancement of Sustainability in Higher Education, *The Princeton Review*, and the *Sierra Club Magazine* have each recognized UNF for our sustainability efforts.

In 2010, I signed the American College & University Presidents' Climate Commitment (ACUPCC), committing UNF to becoming carbon neutral. As an ACUPCC signatory, UNF acknowledges the scientific consensus that global warming is real and is large part being caused by humans. And as an institution of higher education, we have a responsibility to exercise leadership within our surrounding community to model ways to minimize global warming emissions and to provide the knowledge and the education needed to address the associated problems.

The UNF Climate Action Plan, developed by the UNF Sustainability Committee, outlines how we as an institution intend to reduce our greenhouse gas emissions and become carbon neutral by the year 2050. This effort will be completed in three phases, including infrastructural improvements, operational changes and a focus on education and research.

The numerous accomplishments we have already achieved represent the hard work of staff, faculty, and students. The goals and projects outlined in this is plan will help UNF become carbon neutral, requiring the continued participation of the entire university community. We are extremely proud of our sustainability accomplishment thus far and look forward to the challenge of enhancing campus sustainability even further.

[redacted]

John A. Delaney
President
University of North Florida

4567 St. Johns Bluff Road, South Jacksonville, Florida 32224-2648
Tel: (904) 620.2500 Fax: (904) 620.2515
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Executive Summary

1.0 Executive Summary

Since its founding in 1972, the University of North Florida (UNF) has strived to protect the natural environment and has identified "responsibility to the natural environment" as one of its core values. In 2009, UNF completed its first look into climate related issues on campus by completing a greenhouse gas emissions inventory (GHGEI). In October 2010, UNF President John A. Delaney signed the American College and University Presidents Climate Commitment (ACUPCC), which challenged the University to develop a climate action plan (CAP) to become carbon neutral.

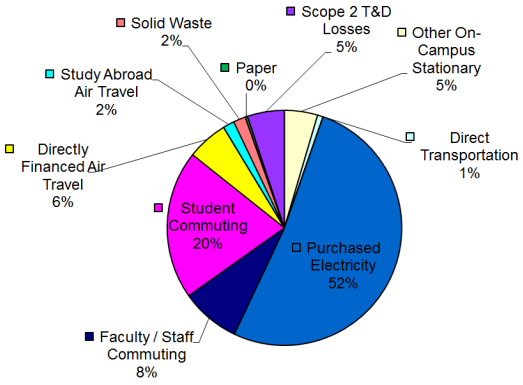


Figure 1 UNF Greenhouse Gas Emissions by Source (GHGEI, 2009)

In 2009 UNF's net greenhouse gas (GHG) emissions totaled 74,229 metric tonnes of carbon dioxide equivalents (MT eCO_2), or 18.9 MT per gross square foot, or 5.3 MT per student. Purchased electricity represents the single largest contribution to GHG emissions at 52 percent. The second highest single contributor is student commuting at 20 percent. Adding faculty/staff commuting (8 percent) to student commuting brings the contribution of commuting overall to 28 percent.

To make the task of achieving carbon neutrality more manageable, the CAP is broken down into three phases (see table 1). The phases are designed to complement each other, with the earlier phases building groundwork for the more ambitious projects in the later phases. Because each phase depends upon the completion of the previous phases, the timelines presented in this plan are subject to change with the progress of each phase.

Table 1 UNF Climate Action Plan Phase and Reduction Targets

Reduction Phase	Reduction Target	Baseline	Goal Year
UNF Phase # 1	40% below	2009	by 2020
UNF Phase # 2	75% below	2009	by 2035
UNF Phase # 3	Carbon neutral by 2050		

The focus of the first phase is education and community involvement. While there will be a continued effort to build community participation during the second phase, more focus will be placed on making operational changes and infrastructural improvements during that phase. Planning projects for the third phase is very challenging because it is impossible to predict how successful the first two phases will be, and thus, what projects will need to be undertaken in the final phase to achieve carbon neutrality. Furthermore, the campus infrastructure and the availability of funding will inevitably change making effective planning very challenging. However, it is safe to say that projects that require large investments and/or offer a lower return on investment are unlikely to be considered until the last phase.

Still, even with a good plan, the process of advancing a large institution towards its goals of carbon neutrality is no easy task. This CAP is to serve as an outline for the initial steps of the transformation process and will lay the foundation by expanding the University's discussion of becoming better stewards of the environment. However, the success of the CAP is not solely rooted in the fine detail but rather in the mindset of wanting to build a better future. The success of this CAP will lead to a University that has a competitive edge in the new global economy, will ensure long-term energy security, and will provide a leadership role for the surrounding community.

Introduction

2.0 Introduction

Climate change is one of the biggest problems facing the planet in the 21st century. The increase in greenhouse gases (GHG), especially carbon dioxide into the Earth's atmosphere is higher than at any other time in human history. This has begun to destabilize earth's natural systems and jeopardize the long-term prosperity of our civilization. The risks associated with continuing to conduct business with existing practices have led governments, institutions, corporations, and individuals to take drastic steps towards reducing GHG emissions.

In 2009, UNF completed its first look into climate related issues on campus by completing a greenhouse gas emissions inventory (GHGEI). This snap shot into UNF's GHG emissions helped pave the way for President John A. Delaney to sign the American College & University Presidents' Climate Commitment (ACUPCC) in October 2010. This commitment challenged the University to develop a climate action plan (CAP) to become carbon neutral.

Through a series of phases, the CAP will transform UNF into a carbon neutral campus by 2050. The plan will outline UNF institutional capacities and current initiatives for which ongoing support is necessary for success. Additionally, the CAP outlines actions essential for building UNF's capacity to effectively prepare for, implement, and track mitigation projects. These efforts include improving data collection systems, cultivation of student, faculty and staff support, and securing financial resources.

The task of implementing the CAP, along with meeting the ACUPCC standards in becoming carbon neutral, is a momentous task. The success of the CAP is not solely rooted in the fine detail but rather in the mindset of wanting to build a better future. The success of this CAP will lead to a University that has a competitive edge in the new global economy, ensures long-term energy security and provides a leadership role for surrounding community.

2.1 Campus Description

The University of North Florida (UNF) was founded in 1972, and is one of Florida's youngest universities. When it first opened its doors in 1972, the University served as an upper-division college for juniors and seniors with originating class of 2,027 juniors. The University began admitting freshman in 1984[1].

The UNF campus included five buildings when it opened, but quickly expanded. A number of new buildings appeared on campus during the 1980s, including on-campus housing, a library and a student life center. The UNF campus now includes 28 major buildings and six housing facilities, totaling more than 4 million square feet. In 2012, a total of 16,357 students were enrolled at UNF. The majority of students reside off-campus, but there are currently six areas of on-campus housing, including the Osprey Fountains, which opened in 2009 and is a Leadership in Energy and Environmental Design (LEED) Certified building.

[1] http://www.unf.edu/info/timeline

Since its founding, UNF has strived to protect the natural environment and has identified responsibility to the natural environment as one of its core values. The first indication of this commitment was the creation of the Sawmill Slough Conservation Club (SSCC), which took its name from the wetland habitat that runs through campus. The group was the first student organization on campus and would leave its mark on the campus. In 1973, the SSCC led the UNF administration to create a network of nature trails inside the Sawmill Slough. Since that time, the trails have been maintained for environmental education, research, and low impact recreation and have become one of the highlights on the UNF campus.

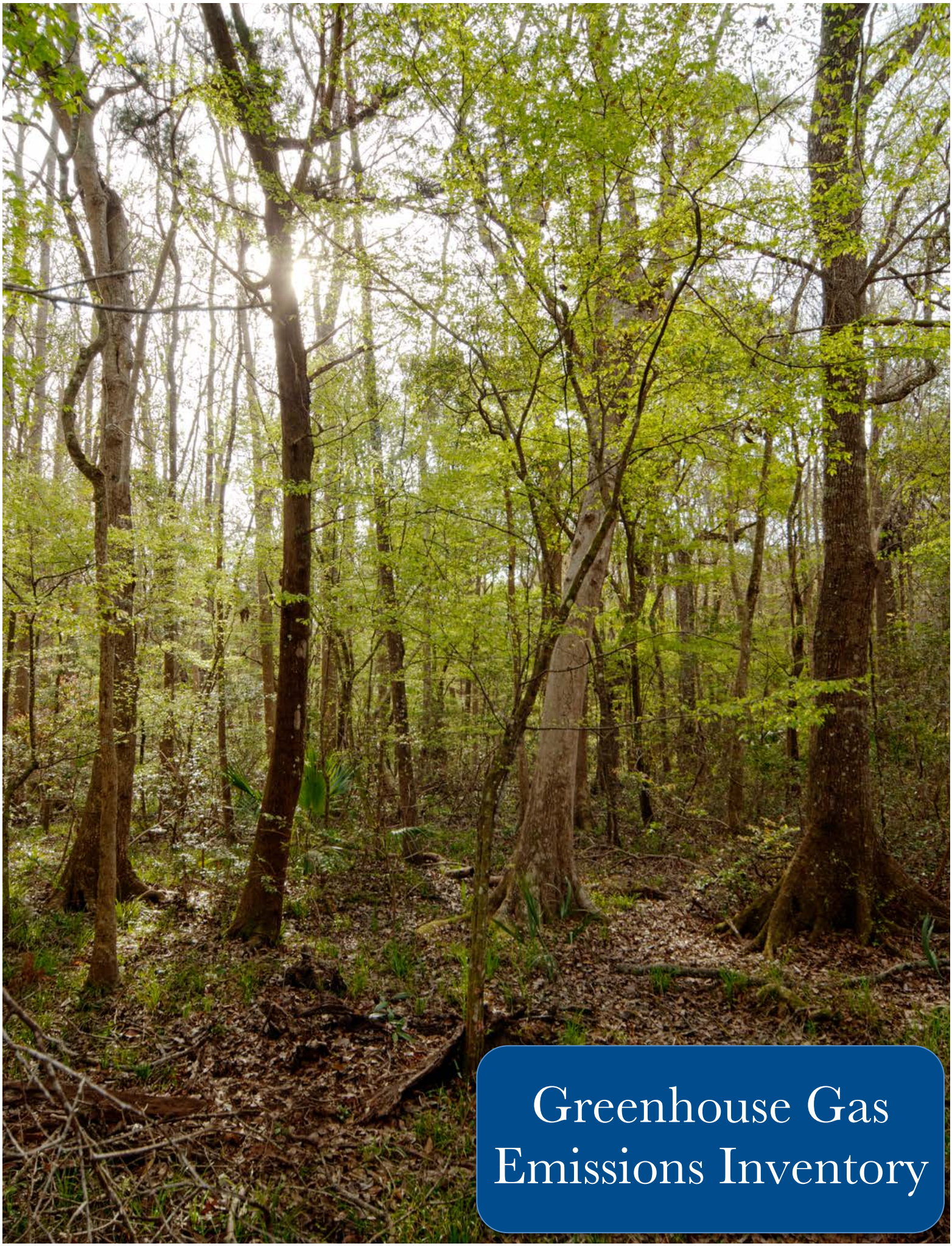
Photo 1 Social Science Building, the first LEED-Certified building on the UNF campus

Protecting the natural environment has also been a core planning principle as the campus has expanded. In 2006, President John Delaney designated the 382-acre Sawmill Slough as a preserve, thus protecting it for future generations of Ospreys. Also in 2006, the Social Sciences building became the first facility to be LEED-certified at UNF. Since that time, eight additional LEED-certified buildings have been built on the UNF campus.

In October of 2010, President Delaney signed the American College and University President Climate Commitment (ACUPCC), making UNF the 644th signatory. [2] The Commitment recognizes the unique responsibility that institutions of higher education have as role models for their surrounding communities and in educating the people who will develop the social, economic, and technological solutions to address global warming and help create a thriving, civil, and sustainable society. [3] While there may be challenges associated with achieving carbon neutrality, signatures recognize the "short-, medium-, and long-term economic, health, social and environmental benefits" of this effort.

Photo 2 President John Delaney and Environmental Center staff at the signing of the ACUPCC in October 2010

[2] For UNF Commitments and Compliances to the ACUPCC see Appendix A.
[3] http://acupcc.org/about/mission-history



Greenhouse Gas Emissions Inventory

3.0 Greenhouse Gas Emissions Inventory

As a signatory of the ACUPCC, UNF recognizes the scientific consensus that global warming is real and it is not the goal of this report to review the science behind climate change. We do provide some basic background information about greenhouse gases (GHG), but readers interested in learning more about climate change are encouraged to take advantage of the vast number of other publications regarding the issue.

After the signing of the ACUPCC, the University was required to complete and submit a GHGEI within one year. This section summarizes the findings of the 2009 GHGEI report and discusses the quantities and sources of UNF's carbon emissions. The UNF Environmental Center conducted the GHGEI for UNF using the Campus Carbon Calculator, which is a widely used tool developed by Clean Air-Cool Planet. [4]

3.1 Definition of Greenhouse Gases

The Environmental Protection Agency (EPA) describes GHG's as any gas that absorbs infrared radiation in the atmosphere. When heat flows back towards space from the Earth's surface, it can be trapped by GHG's causing a buildup in the Earth's atmosphere (troposphere) near the surface.[5] If these atmospheric concentrations of greenhouse gases continue to rise, the average temperature of the lower atmosphere will gradually increase. This concept is called the greenhouse effect and can be enhanced by human activities.

The EPA has devised a universal, standard measurement that allows for the comparison of different greenhouse gases based on their ability to trap heat in the atmosphere. The unit that has been given to make things more manageable is CO_2 equivalents (eCO_2). An example of this unit of measurement can be explained by methane. Methane has a global warming potential of 21, which means that a metric tonne of methane is approximately 21 times as effective at warming the atmosphere as is a metric tonne of CO_2. Thus, in terms of CO_2-equivalents, a metric tonne of methane is the same as 21 metric tonnes of CO_2.

Some of the principal greenhouse gases that enter the atmosphere because of human activities are as follows:

- **Carbon Dioxide (CO_2):** Carbon dioxide enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and also as a result of other chemical reactions (e.g., manufacture of cement). Carbon dioxide is also removed from the atmosphere (or "sequestered") when plants absorb it as part of the biological carbon cycle.
- **Methane (CH_4):** Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid, waste landfills.
- **Nitrous Oxide (NO_2):** Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.
- **Fluorinated Gases:** Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are synthetic, powerful greenhouse gases that are emitted from a variety of

[4] http://www.cleanair-coolplanet.org/toolkit/inv-calculator.php
[5] For more information on GHG and climate change see http://www.epa.gov/climatechange/

industrial processes. Fluorinated gases are sometimes used as substitutes for ozone-depleting substances (i.e., CFC's, HCFC's, and halons). These gases are typically emitted in smaller quantities, but because they are potent greenhouse gases, they are sometimes referred to as High Global Warming Potential gases.[6]

Greenhouse gas emissions generated directly and indirectly by an entity such as a university can be classified into "scopes," based on the source of the emissions:

- **Scope 1** emissions are those GHG's that are directly released on-site, such as combustion of fuels and the application of fertilizers on campus.
- **Scope 2** emissions result from energy purchased from off-site sources where fuels are burned.
- **Scope 3** emissions include all other GHG-producing activities associated with the activities of an institution, including: commuting, directly financed faculty and student travel, waste disposal, and embodied emissions from the extraction, production, and manufacturing of purchased goods (i.e. paper products).

Scopes 1 and 2 are generally considered the most significant, because they usually comprise a very substantial portion of GHG emissions and they are accurately measurable. Scope 3 is generally the most difficult to measure accurately, because they come from a wide variety of small and often individualized sources.

3.2 Institutional Data

The UNF Environmental Center staff collected data used to calculate UNF's GHG emissions between 2008 and 2010. The data came from a variety of sources, including the UNF Budget Book (available at the Thomas G. Carpenter Library), email correspondence and face-to-face interviews with UNF staff. Several individuals from both inside and outside the University reviewed the draft report. Tables 2 through 4 summarize the data used to calculate carbon emissions.

Table 2 Students, Faculty and Staff Population by Year

Population	2008-2009	2009-2010
Full-time students	10,388	11,228
Part-time students	5,042	5,491
Summer students	9,980	10,261
Faculty	619	830
Staff	1,115	1,642

Table 3 Building and Research Space by Year

Type of Space	2008-2009	2009-2010
Total building space (sq. ft.)	3,845,599	3,933,081
Total research building space (sq. ft.)	41,307	42,050

[6] http://www.epa.gov/climatechange/

Table 4 Energy and Resource Data

Scope 1 Data:		
Energy/Resource Type	**Year**	**Average Total Amount Consumed Per Year**
Natural Gas	2009	53,857 MMBTUs
Gasoline Fleet	2008	24,498 gallons
Diesel Fleet	2008	2,405 gallons
Synthetic fertilizer	2008	3,900 pounds

Scope 2 Data:		
Electricity	2008	55,468,140 Kilowatt-hours

Scope 3 Data:		
Commuting (Faculty and Students)	2008	139,745,250 miles/per year
Commuting (Staff)	2008	12,315,000 miles per/year
University Sponsored Travel	2008	5,389,189 miles
Solid Waste	2008	2,280,820 pounds

The Jacksonville Electric Authority (JEA) is the local utility company providing electricity to UNF. The custom fuel mix used by JEA in 2008 was used in the Campus Carbon Calculator (CCC) and appears in Table 5 below. Items in the custom fuel mix were matched to the closest category available in the Campus Carbon Calculator.

Table 5 Jacksonville Electric Authority's Fuel Mix

Fuel Source	Percentage in Fuel MIX Reported by JEA	Closet Category in CCC
Coal	51%	Coal
Petroleum coke	19%	Residual Oil
Coal (power purchase)	10%	Coal
Oil	1%	Distillate Oil
Natural Gas	14%	Natural Gas
Other	5%	Net Purchased

3.3 Greenhouse Gas Inventory Results

UNF's net GHG emissions in 2009 were 74,229 metric tonnes (MT) of carbon dioxide equivalents (MT eCO_2), or 18.9 MT per gross square foot, or 5.3 MT per student. Table 6 below provides emissions relative to several institutional variables.

Table 6 UNF GHG Emissions in 2009 Relative to Institutional Variables

Category	GHG
Kilograms eCO_2 per dollar of operating budget	1.247
Kilograms eCO_2 per dollar of research budget	8.1
Kilograms eCO_2 per dollar of energy budget	14.6
MT eCO_2 per student	5.3
MT eCO_2 per community member (students, faculty and staff)	4.5
Kilograms eCO_2 per square foot building space	18.9
Kilograms eCO_2 per square foot research space	1,765

The sources of UNF's GHG emissions are shown in Figure 2. Purchased electricity represents the largest percentage of GHG emissions at 52 percent. The second highest single contributor is student commuting at 20 percent. Adding faculty/staff commuting (8 percent) to student commuting brings the contribution of commuting overall to 28 percent.

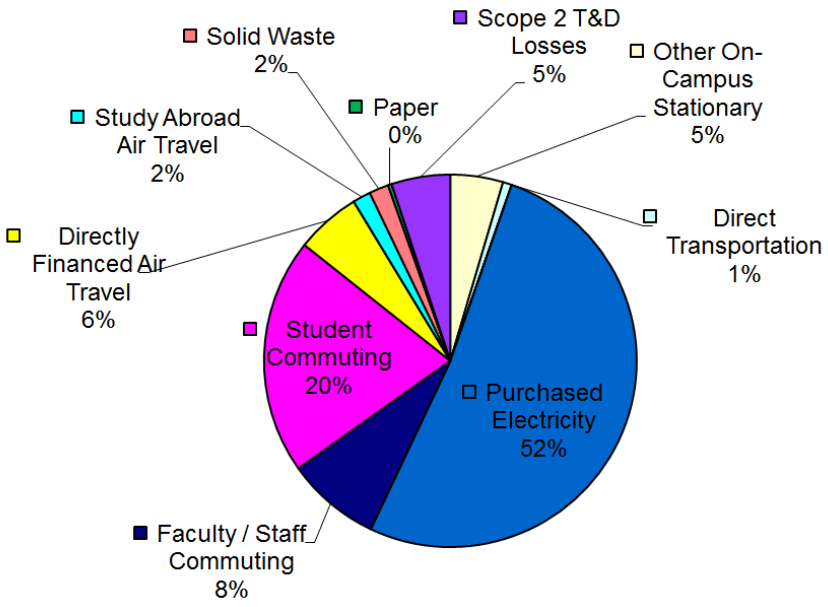


Figure 2 UNF Greenhouse Gas Emissions by Source (GHGEI, 2009)

Several other smaller sources contribute to the overall emissions profile. Directly financed air travel comprises 6 percent, on-campus stationary sources and losses from the transmission and distribution of purchased electricity (T and D) each account for 5 percent. Solid waste and study abroad travel each make up 2 percent. Direct transportation from the vehicle fleet is quite small and rounds up to 1 percent. Emissions from paper are accounted for in the inventory but are low enough to comprise 0 percent on the scale of this chart.

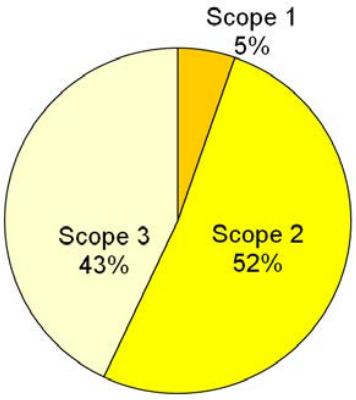


Figure 3 GHG Emissions by Scope (GHGEI, 2009)

Stationary combustion sources at UNF emitted 3,393 MT in 2009. This amount falls well below the reporting limit established by the EPA calling for large facilities like plants and universities to report stationary emissions sources if they exceed 25,000 MT carbon dioxide annually. At UNF, these sources consist primarily of natural gas for boilers, domestic and hot water heating, and pool heaters.

As seen in Figure 3, Scope 1 emissions represent the smallest percentage and come from the use of natural gas on campus and direct transportation. Scope 2 mirrors UNF's purchased electricity contribution at 52 percent. Indirect sources from Scope 3 add up to a contribution of 43 percent that is nearly as high as Scope 2.[7]

[7] For the full version of the 2009 UNF GHGEI see: http://www.unf.edu/uploadedFiles/aa/ecenter/GHGEIFinal25Oct10.pdf

3.4 Expected Growth and Projected Emissions

According to the 2010-2020 UNF Campus Master Plan, student enrollment at UNF is projected to rise from 16,000 students in 2009 to approximately 25,000 students in 2030 (see figure 3).

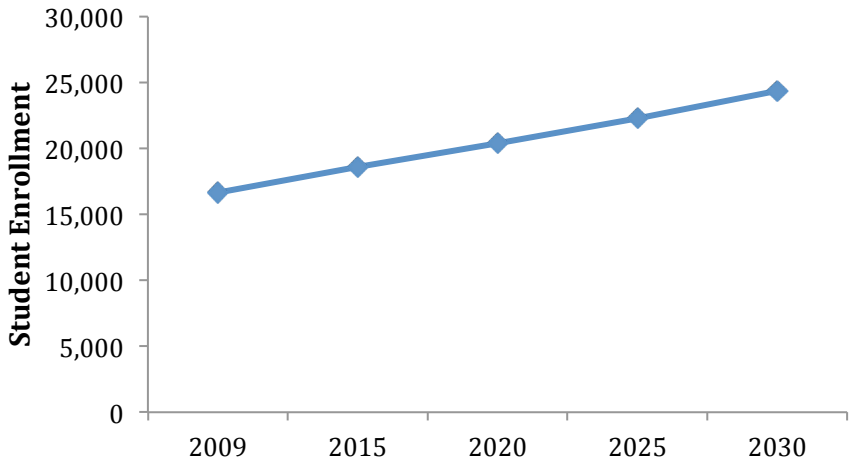


Figure 4 Student Enrollment Projections from 2009 to 2030 (UNF Campus Master Plan, 2010)

This rate of growth is consistent with UNF's historic growth rate from its founding in the 1970s. This expected growth would require additional academic, student life, housing, and service spaces as the current campus is at capacity for its existing enrollment. Figure 4 below outlines the expected gross square footage (GSF) from 2009 to 2030.[8]

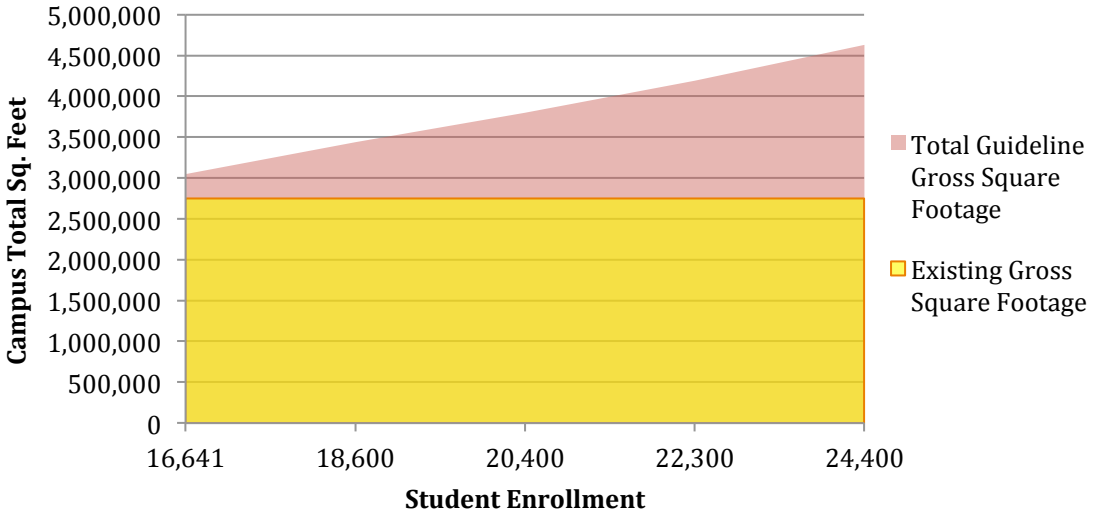


Figure 5 Projected GSF from 2009 to 2030 (UNF Campus Master Plan, 2010)

[8] Data and graphs were taken from the 2010 master plan, which can be found here: http://www.unf.edu/uploadedFiles/anf/masterplan/2010_-_2020_Master_Plan/SMALL%20REDUCED110110_UNF_Final%20Report_v10.pdf

The Campus Carbon Calculator also provides projections for carbon emissions. These projections are generated by assumptions and calculations in the spreadsheet that address inflation and other predictably changing variables. Growth trends were assumed to be linear for institutional data fields.

The expected increase in student enrollment and GSF has a proportional increase in carbon emissions. UNF totaled 74,229 MT eCO_2 in 2009, but if UNF does not try to mitigate its carbon emissions, they will steadily increase to approximately 323,074.9 MT eCO_2 by 2050 (see figure 7). These are only projections, but they do offer valuable insight about where we are headed if no action is taken.

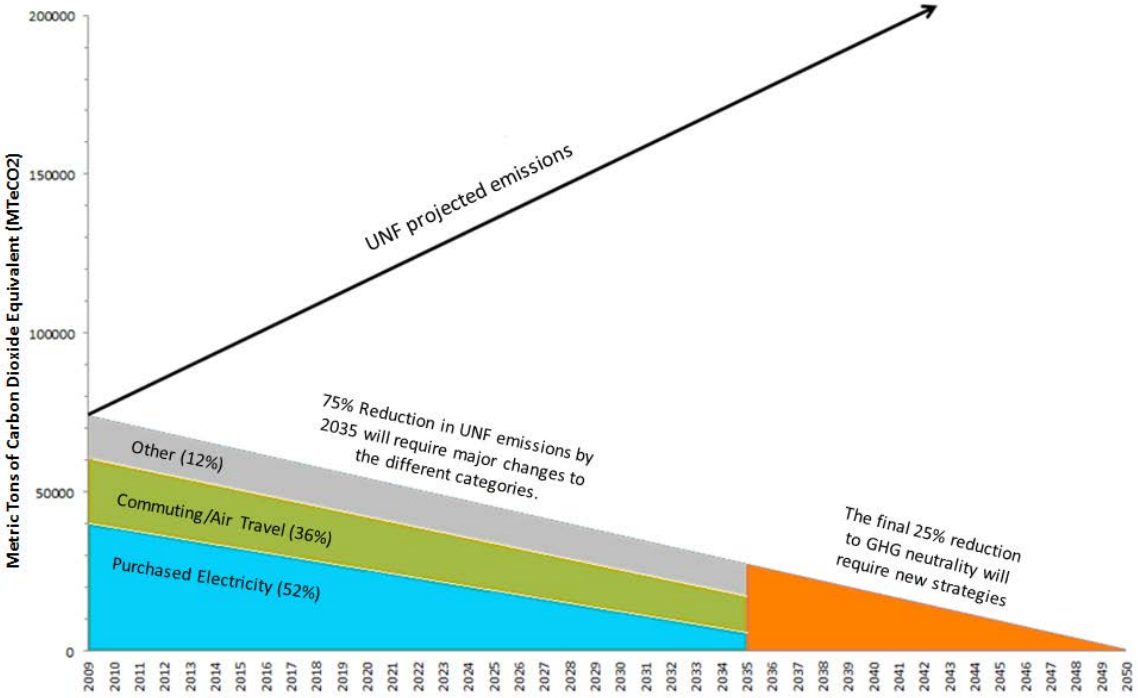


Figure 6 Projected GHG Emissions at UNF

Developing the Plan

4.0 Developing the Plan

The development of UNF's Climate Action Plan (CAP) started after UNF President Delaney signed the American College & University Presidents' Climate Commitment (ACUPCC) in October 2010. By signing the ACUPCC, President Delaney acknowledged UNF's responsibility as community leaders and committed UNF to becoming carbon neutral.

4.1 Sustainability Committee

The Sustainability Committee has been tasked with creating and implementing a climate action plan for UNF. Prior to its formation there were three separate committees tasked with coordinating sustainability on campus: the Environmental Advisory, Waste Reduction and Sustainability Strategic Planning Committees. These three committees were combined into one in order to improve communication and intracampus collaboration.

The Sustainability Committee is chaired by the Coordinator of the UNF Environmental Center and is comprised of representatives from Administration and Finance, Student Affairs and Academic Affairs, including faculty members. Please see Acknowledgments at the end of this report for a complete list of Sustainability Committee members.

The Committee meets once a month, and discusses a wide range of topics including, but not limited to, operations, academics, and the campus' natural assets. Within the Sustainability Committee there are a number of subcommittees that have been created to address specific areas of focus.

4.2 Implementation Structure and Strategy

When developing UNF's CAP, the Sustainability Committee considered a number of greenhouse gas reduction guidelines. Both the Federal Government and the State of Florida have created timelines for GHG reduction (see table 7). In addition, a number of CAPs from peer institutions were considered.

Table 7 Reduction Goals from the Federal American Clean Energy and Security Act (ACES Act) and the State of Florida's Executive Order 07-126.[9]

Milestones	ACESA (Federal)			Executive Order 07-126 (State of Florida)		
	Target	Baseline	Goal Target	Target	Baseline	Goal Target
Interim #1	03% below	2005	by 2012	10% below	2007	By 2012
Interim #2	17% below	2005	by 2020	25% below	2007	By 2017
Interim #3	42% below	2005	By 2030	40% below	2007	By 2025
Interim #4	83% below	2005	By 2050	N/A	N/A	N/A

To make the task of achieving carbon neutrality more manageable, the CAP is broken down into three phases. An outline of the GHG reduction goals associated with each phase is provided in Table 8. The phases are designed to complement each other, with the earlier phases building groundwork for the more ambitious projects in the later phases. Because each phase depends upon the completion of the previous phases, the timelines presented in

[9] For more information see Appendix B

this plan are subject to change with the progress of each phase. While every effort will be made to achieve these goals, there is no penalty if the projected reductions are not reached by the intended dates.

Table 8 University of North Florida Greenhouse Gas Reduction Goals

Reduction Phase	Reduction Target	Baseline	Goal Year
UNF Phase # 1	40% below	2009	by 2020
UNF Phase # 2	75% below	2009	by 2035
UNF Phase # 3	Carbon neutral by 2050		

When developing the phases, a list of potential mitigation projects was developed and the members of the Sustainability Committee reviewed the list of potential projects based on feasibility, initial start-up costs, recurring costs, and return on investment. Committee members also made recommendations on which phase the project should be completed. Below is a summary of each of the three phases and a short non-exhaustive list of potential projects.

Phase I: Planting the Seed (2013-2020)

Goal: 40 percent reduction from current [2009] emission levels

The first phase of the CAP will begin immediately following the release of this report and culminate in 2020. The goal of the first phase is to reduce the total GHG emissions by 40 percent, compared to the 2009 baseline. This reduction goal was chosen because of Executive Order 07-126, which requires all state agencies and departments to reduce total GHG emissions by 40 percent by the year 2025.[10] This would give UNF a 5-year window to ensure compliance with the executive order.

The main focus of the first phase is education and community involvement. As was mentioned earlier, purchased electricity (52 percent) and commuting (28 percent) represent the majority of GHG emissions at UNF, both of which are directly impacted by behavior. The Sustainability Committee, and more specifically the communications subcommittee, will develop programs that will help inform the UNF community about climate change. They will provide information about GHG emissions at UNF, progress on reducing GHG emissions and ways that the UNF community can help. The subcommittee will utilize the many available communication tools already in place, such as Osprey Update and the UNF Environmental Center's monthly newsletter, but they will make suggestions on new communications methods if needed.

In addition to improving communication, reducing total energy demand through infrastructural and operational improvements is critical to the success of this project. To date, a number of projects that were considered to be easily achievable and reduced total energy demand have already been completed. Examples include switching to energy efficient lighting fixtures and retro-commissioning older buildings (see appendix D for more details).

The University has also recognized the importance of sustainable development and has made a commitment that all new buildings and renovations on campus should be

[10] http://www.epa.gov/statelocalclimate/state/tracking/individual/fl.html

Leadership in Energy and Environmental Design (LEED) certified. The first UNF building to achieve LEED certification was the Social Sciences building in 2006. Since that time eight additional LEED certified buildings were constructed and one building was renovated to LEED standards.

Photo 3 Student Union, a LEED-Certified Gold building on the UNF campus

These types of projects have improved the energy efficiency of older buildings and helped curtail energy demand as the campus has grown significantly in size. A continued focus on responsible, sustainable development will be important in achieving carbon neutrality.

Lastly, the Sustainability Committee will continue to explore possible mitigation strategies, particularly for the later phases. The subcommittees will each examine their focus areas and look for opportunities to reduce carbon emissions. Each subcommittee will prepare a list of potential projects and provide relevant information including feasibility, start-up and recurring costs, potential barriers and return on investment (based on economic, environmental and social factors). Additionally, the Sustainability Committee will explore possible sources of funding, which will be necessary in the later phases.

The importance of the first phase cannot be minimized, because the later phases depend upon its success. Building strong community participation is critical to the long-term success of this project and carbon neutrality would be difficult to achieve without strong community support.

Examples of Potential Projects in Phase I:

- Implement a pre-consumer composting program to divert food waste from cafeteria.
- Create an on/off schedule for lighting and large computer stations.
- Start an "eco-rep" program that will use peer-to-peer education to teach students about sustainable living on and off campus.
- Develop a plan to incorporate sustainability into curriculum and expand sustainability education opportunities.
- Improve outreach, advertisement, and education to increase awareness of existing sustainability programs.
- Retro-commissioning the older buildings on campus to ensure that equipment and systems are functioning properly.
- Organize faculty and staff workshops about sustainability.

Phase II: Growing the Seed (2020-2035)

Goal: 75 percent reduction from current [2009] emission levels

The second phase will start in 2020 and end in 2035, with the goal of reducing 2009 GHG emissions by 75 percent. As the first phase comes to a close, the Sustainability Committee will evaluate the progress of reducing GHG's and revise the CAP. The revised document will

build upon the successes of the first phase and take into account the recommended mitigation strategies that were developed during the first phase.

While there will be a continued effort to build community participation during the second phase, more focus will be placed on making operational changes and infrastructural improvements. Due to the constant change in available technology and associated costs, it is hard to predict what projects will be feasible during the second phase; however, it is reasonable to assume that mitigation strategies that are currently not economically feasible, such as the extensive use of LED lighting and solar panels, may become feasible in 10 to 20 years.

Examples of Potential Projects in Phase II:

- Move campus towards exclusive use of LED lighting.
- Explore ways to begin using alternative sources of energy, such as solar power.
- Phase out gas-powered vehicles and move towards an alternative fuel fleet.

Phase III: Ensuring its Future (2035-2050)

Goal: 100 percent reduction from current [2009] emission levels

The third phase will begin in 2035 and end in 2050, with the goal of reducing 2009 GHG emissions by 100 percent. Planning projects for this phase is very challenging, because it is impossible to predict how successful the first two phases will be and thus what projects will need to be done in the final phase to achieve carbon neutrality. Furthermore, the campus infrastructure and the availability of funding will inevitably change making effective planning very challenging. However, projects that require large investments and/or offer a lower return on investment will be saved until the last phase.

4.3 Tracking Progress

The goal of this plan is to help guide UNF towards carbon neutrality; however, we will need the ability to accurately track GHG emissions in order to evaluate our progress towards that goal. In addition, accurately tracking reductions in GHG emissions from various mitigation projects will improve management and decision-making throughout the implementation of the CAP. This data will also be important when building institutional support for larger, more expensive projects.

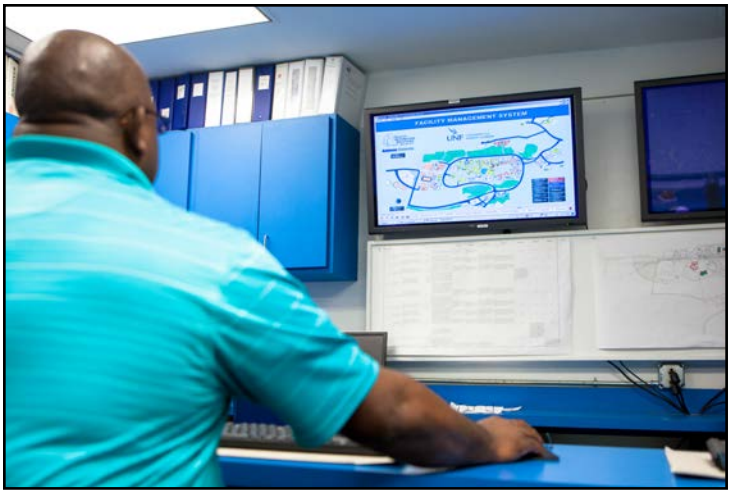


Photo 4 Physical Facilities has the ability to track relevant information, such as energy use, from a central location

Tracking GHG emissions is relatively new to the University and record keeping is constantly evolving to keep pace with new demands. Currently, the UNF Environmental Center compiles institutional data from various departments and enters it into Clean Air-Cool Planet's Campus Carbon Calculator. To learn more about UNF's current GHG emissions and how they are calculated, please visit section

three of this report. The Sustainability Committee is currently exploring other options for tracking GHG emissions. As UNF's tracking ability progresses into the future, there is great potential for optimizing the use of resources in a more efficient way. This will also allow for a more accurate understanding of UNF's carbon foot print and better estimates on how well the University is meeting the CAP targets and goals.

While tracking GHG emissions is essential to the success of the CAP, it is not the only important type of data. In addition to GHG emissions, there is a variety of important information that can help the University understand its carbon footprint, such as energy and water use, commuting and behavior choices. One example of important data collection is UNF's participation in the Sustainability Tracking, Assessment and Rating System™ (STARS), which was created by the Association for the Advancement of Sustainability in Higher Education (AASHE).[11] STARS offers a great way for universities to track their sustainability performance and provides a meaningful comparison over time and across institutions. UNF received a bronze designation from STARS in 2012, for its sustainability programs and achievements.

Another example of gathering other pertinent information is the Commuting Preferences Survey (CPS), which was first completed in 2011.[12] The goal of the survey was to assess the commuting preferences of the UNF community in order to aid in the design of an efficient and sustainable transportation system. As was mentioned earlier, commuting represents approximately 28 percent of UNF's carbon footprint, so having a detailed report such as the CPS offers a convenient way to address the feasibility of projects such as carpooling and their relative benefits.

4.4 Schedule of Revisions

As outlined in the ACUPCC agreement, there will be alternating yearly updates of UNF's greenhouse gas emissions and Climate Action Plan. In addition, the Climate Action Plan will be revised and updated following the completion of each phase. UNF is currently on track to complete its second GHGEI in 2014 and will complete one every other year afterwards. The ACUPCC requires that universities submit progress reports on their CAP every other year. The first progress report will be due in 2015 and will be completed every other year afterwards. See table 9 for an outline of the schedule of updates and revisions.

[11] https://stars.aashe.org/
[12] UNF CPS's full report can be found at: http://www.unf.edu/uploadedFiles/aa/ecenter/2011%20Commuting%20Preferences%20Survey%20Report.pdf

Table 9 Schedules of Revisions and Updates for the ACUPCC and UNF CAP

Schedule of Updates and Revisions	
2009	Greenhouse Gas Emissions Inventory (GHGEI)
2013	Climate Action Plan (CAP) 1.0
2014 and every other year	GHGEI Progress Report
2015 and every other year	CAP Progress Report
2021	CAP 2.0 - Revisions and updates
2036	CAP 3.0 - Revisions and updates
2050	CAP 4.0 – Revisions and updates

4.5 Financing the Climate Action Plan

This Climate Action Plan outlines a number of goals and describes the strategies for achieving carbon neutrality on the UNF campus; however, implementing the outlined strategies is dependent upon financing. While financing is not the only type of resource needed to complete these projects, its importance cannot be minimized. Furthermore, the current economic and political climate makes finding adequate sources of funding even more challenging. That is why it is important to the long-term success of the CAP to diversify the sources of funding to avoid disruptions due to downturns in the economy or cuts in state funding.

This section of the CAP outlines, in no particular order, a number of potential funding sources. Like many other parts of this plan, this list was compiled from research on what other universities are doing to fund their CAPs and does not commit UNF to pursuing any one type of funding. Rather, this is a list of potential funding sources and the Sustainability Committee will evaluate each potential source before moving forward.

Savings From Mitigation Strategies
While the projects and programs outlined in the CAP focus on reducing UNF's total GHG emissions, many of them also lead to a direct reduction of utility costs. Due to the amount of purchased electricity consumed by the University, even small reductions can lead to savings in the hundreds of thousands of dollars. Reinvesting even a portion of these financial savings would provide the CAP with strong financial support.

Reducing GHG emissions is not the University's only funding priority, so we cannot reasonably expect all savings from energy reductions to be reinvested in this manner; however, this does present a potential source of continued funding. Projects that are funded in this manner should show a strong return on investment, so they can perpetuate additional savings.

Sustainability Fund
A growing trend among colleges and universities is the creation of a sustainability fund or what is more commonly referred to as a "green fee". This type of funding would come from a fee assessed to students, either in the form of a flat fee or a per credit hour fee. These funds can come from a dedicated student fee that will be used exclusively for sustainability projects or from an allocation of an existing student fee.

Since this is a student fee, students should have a voice in how these funds are spent. The way these funds are managed varies from university to university, but generally student government plays an important part in the decision making process. This type of funding presents a unique opportunity for students to become active in helping make the campus become carbon neutral.

Foundation
Raising funds to support sustainability projects through the UNF Foundation could prove to be one of the most effective funding strategies. Not only would it provide financial support for mitigation projects, but it also presents a way for the UNF community, particularly alumni, to stay involved and participate in the process.

There are several potential ways to raise funds, including graduation pledges, alumni campaigns, and gifts from foundations and private companies. Funds could be used to support a single project, build an endowment, create a revolving fund or a combination of all three. The latter two would be important for long-term success of the CAP.

Voluntary Contribution
Everyone in the UNF community is responsible for their share of GHG emissions; therefore, everyone should be part of the solution or at least have the option to be. By providing a voluntary way for the UNF community to offset their contribution, we are developing a culture of personal responsibility.

A carbon offset is a unit of carbon emissions that you purchase and in turn funds projects that reduce global GHG emissions by an equivalent unit. There are a number of opportunities whereby the University can provide an option to individuals to purchase a carbon offset.

One example would be to provide a voluntary option when purchasing a campus-parking pass to also purchase a carbon offset. The idea is that if someone is purchasing a parking pass, they will be commuting to UNF and therefore emitting greenhouse gasses. So this can serve as both a communication tool to inform the UNF community about the impact their daily habits have and as a way for them to help contribute to funding mitigation projects.

Funds generated in this manner could be used to fund mitigation projects on campus that would have a direct impact on reducing total GHG emissions at UNF.

Grants and Rebates
Part of the process of making the United States a more energy efficient and sustainable nation has been to offer financial incentives to public and privates businesses, so that investing in sustainability is more viable. The Federal Government, as well as the State of Florida, has set up numerous financial programs in the form of grants and rebates, both of which offer a great opportunity for UNF to obtain funding in sustainability. In addition, many energy and utility companies offer financial incentives, grants and rebates when switching to a more sustainable energy source. However, many of the grants and rebates offered are for specific projects (i.e. solar panels) and they are generally only offered for a set period and are not permanent offers. So grants and rebates are by no means a solution

to the plans long-term financial needs, but rather a good alternative to continually pursue as the plan progresses.[13]

4.6 Barriers and Limitations

Throughout the planning process, a series of limitations and barriers were identified. This section attempts to break through some of these barriers by first identifying them and then making recommendations for improvement.

Financing
Failure to obtain the financial support needed could pose a major threat to UNF becoming carbon neutral by 2050. The uncertainty of state funding, along with an ever-changing world, makes it difficult to predict how much funding will be available for mitigation projects.

Recommendation: Set up long-term financial policies that have continuity in savings as the University grows. This will help eliminate some of the economic uncertainties of the future. In addition, the diversification of funding sources will help prevent disruptions in the implementation of this plan.

Data/Tracking
The task of gathering data and accurately tracking it can be problematic, possibly leading to under or over estimations of GHG emissions. For example, Scope 3 emissions, which consist of indirect GHG emissions (i.e. manufacturing and transporting goods), are not as easily tracked. Although there are existing methods for tracking Scope 3 emissions in a relatively accurate manner there is always room for improvement. It is important to understand that the data and benchmarks that are presented in this plan have been obtained in the best way possible with the resources at hand.

Recommendation: Establish a policy that creates more transparency between the individual departments that possess the data and the individuals that seek it. Furthermore, centralizing this data would reduce the amount of time spent responding to surveys and other requests for information.

Communication
Effective communication and participation is critically important to the success of the CAP. If the UNF community does not know how to or have the desire to make UNF a sustainable campus, then the success of the CAP could fall short of expectations. A lack of communication will ultimately lead to less participation and support, both of which are vital to the plan's success.

Recommendation: Develop methods for disseminating information and provide opportunities for the UNF community to participate in the planning process. This will both help educate the community about relevant issues and empower them to make the right decisions based on best practices.

[13] The U.S. Department of Energy has currently organized both federal and state grants/rebates into one easily accessible website found here: http://www1.eere.energy.gov/femp/financing/eip_fl.html

Curriculum, Research & Community Outreach

5.0 Curriculum, Research, and Community Outreach

As an institute of higher education, UNF has a unique responsibility in regards to climate change. In addition to taking a leadership role in reducing GHG emissions, UNF is also responsible for educating and training students of all disciplines to respond to the problem of climate change.

The UNF Environmental Center was established in 2004 with the purpose of supporting cross-disciplinary education and research related to the environment. Since that time, the UNF Environmental Center has created a number of programs to help educate students and foster environmental research on campus.

This section of the CAP outlines some of the current academic and research programs at UNF and discusses how climate change and sustainability will be further integrated into the curriculum.

Photo 5 Students volunteering at Garbage on the Green, an annual waste audit and educational event organized by the Environmental Center

5.1 Curriculum and Education

Offering course work in areas that educate students about sustainability is a great way to build a more sustainable future. UNF currently offers a number of degrees and minors related to sustainability, including the coastal environmental science major and environmental studies minor. The UNF School of Engineering has incorporated environmental engineering classes into their majors and the Coggin College of Business recently created the Center for Sustainable Business Practices.[14]

The UNF Environmental Center has assembled a list of environmental and sustainability related courses offered at UNF and has made the list available on its website.[15] The Sustainability Committee will look for ways to expand the inclusion of sustainability into current courses, including faculty workshops and incentives.

In addition to providing traditional course work, a number of other opportunities are available to students. One example is the St. Johns River Transformational Learning Opportunity (TLO), which is organized by the UNF Environmental Center. During the St. Johns River TLO a group of eight to ten students embark on a 9-day journey down the St. Johns River. While on the trip, students interact with a variety of scientists, artists, historians and activists. Each student is required to conduct a research project related to their field of study and must discuss their projects with the group.

[14] http://www.unf.edu/coggin/csbp/
[15] http://www.unf.edu/ecenter/Class_List.aspx

There are also a number of peer-to-peer educational groups on campus. These groups use students to educate the UNF community about environmental topics and sustainable living. Some examples are included below.

- The Department of Housing and Residence Life Green Team helps teach students who live on campus about current environmental issues and how to reduce their environmental footprint.
- Students from the Frederick and Ophelia Tate Ogier Organic Gardens teach other students about organic gardening and choices for a healthy lifestyle.
- Eco-Adventures, a unit within the Department of Recreation, offers experiences that cultivate awareness of the natural world. Students can check out camping and outdoor equipment, such as tents, backpacks, canoes, and kayaks. Eco-Adventures also organizes a number of trips and workshops for students.

Photo 7 Students can check out a variety of outdoor equipment from Eco-Adventures, which can be used on or off campus

Photo 6 Students can learn about gardening at the Ogier Organic Garden located on campus

5.2 Research

The UNF Environmental Center currently offers "Seed Grants" every year to fund faculty with the intent of facilitating the creation or maintenance of multidisciplinary projects related to environmental teaching and research. To date, 33 projects have been funded through the Seed Grant program.

The Sawmill Slough Preserve is a 384-acre natural area located on the UNF campus, which makes it the perfect location to conduct environmental research. There are a number of research projects already being conducted within the preserve, including gopher tortoise research and an inventory of all plant species located in the preserve.

Photo 8 The new Biological Sciences Building, a LEED-Certified Gold building, contains a research greenhouse

There are also research partnerships between UNF and the surrounding community. The St. Johns River Report is an annual report on the health of the St. Johns River. The project is a collaboration of faculty members from UNF, Jacksonville University and Valdosta State University. [16]

[16] For more information about the St. Johns River Report visit http://www.sjrreport.com

5.3 Community Outreach and Public Engagement

The University of North Florida has a strong commitment to community engagement, as it is one of the core values of UNF and one of the goals outlined in its strategic plan. The University is currently involved in both community based research, as well as education.

The UNF Environmental Center regularly partners with local organizations to help educate the community about environmental issues, as well as provide forums to address those problems. An example of this type of partnership is the City of Jacksonville Environmental Protection Board (EPB) Symposium. The symposium has been hosted on the UNF campus for the past few years and offers the Jacksonville community a chance to interact with policy makers and private businesses. UNF has also partnered with the American Medical Association and the Center for Health and Global Environment at Harvard Medical School, to bring public forums about climate change and its impact on human health.

Conclusion

6.0 Conclusion

The University of North Florida is committed to its "responsibility to the natural environment" and will continue towards the realization of that goal. As a signatory of the ACUPCC, we have acknowledged the problem of climate change and believe that universities play an integral role in addressing that problem. This CAP highlights a number of programs and projects that have been undertaken on UNF campus (see Appendix D for more details) and it serves as a roadmap for achieving carbon neutrality by the year 2050.

Still, even with a good plan, the process of transforming a large institution towards its goals of carbon neutrality is no easy task. The CAP is to serve as an outline for the initial steps in the transformation process and will lay the foundation by expanding the University's discussion of becoming better stewards of the environment.

The success of the CAP will depend on many factors, some of which the University will be able to bring about using current resources, while others may require additional resources. Collaboration across traditional institutional boundaries are essential for overcoming operational challenges and partnerships with private industry, public agencies and the community will play a vital role in reaching the University's goal of carbon neutrality.

Becoming a sustainable campus is a work in progress, and will take a continuous effort by the university community. Signing the ACUPCC, completing the GHG inventory, and developing a CAP plan has been the desire of the UNF community and their continued support will be critical to achieving carbon neutrality. Universities have a unique responsibility as community leaders and the fundamental moral principle of building a sustainable future is one that aligns with UNF's core values.

As Franklin D. Roosevelt once said, "the only limit to our realization of tomorrow is our doubts of today." We hope the UNF community embraces this plan and collectively works toward a better, more sustainable future.

Appendix A: UNF Commitment to the ACUPCC

ACUPCC Steps *Sub-Steps*	Compliance Status	Details
1. Establish an Institutional Structure	Yes	The Sustainability Committee coordinates sustainability efforts on campus and is responsible for the development and implementation of the UNF Climate Action Plan. The UNF Environmental Center is a cross-campus entity that conducts research and educates the community about environmental issues. The UNF Environmental Center will assist the Sustainability Committee with the implementation of the UNF Climate Action Plan.
2. Complete a GHG inventory report within one year of signing the ACUPCC	Yes	UNF publically reported GHG emissions for the year of 2009 and will complete a second GHG inventory in 2014. UNF will continue to publically track GHG emission into the future.
3. Develop institutional climate neutral action plan (within two years).	Yes	UNF climate action plan was completed in the spring of 2013 and is a living testament to the University's goal of becoming carbon neutral.
i. a. Set neutrality target date.	Yes	Neutrality by 2050
ii. b. Set Interim targets & goals.	Yes	• 2013-2020 40% reduction • 2020-2035 70% reduction • 2035-2050 100% reduction
iii. c. Action to make climate change a part of the curriculum and other educational experiences	Yes	See educational mitigation section
iv. d. Actions to expand research on climate change and potential	Yes	See research and curriculum mitigation section

solutions		
4. Initiate ≥ 2 tangible GHG emission reduction actions.	Yes	See details in Sub-Steps
i. Encourage use of and provide access to public transportation for all faculty, staff, students and visitors at our institution.	Yes	UNF has established of campus shuttling to local businesses and public transportation stops.
ii. Establish a policy that all new campus construction will be built to at least the U.S. Green Building Council's LEED Silver standard or equivalent.	Partially	Currently, there is no signed University policy for new campus construction standards, but President Delaney has publicly announced his commitment to making all new buildings LEED certified.
iii. Participate in the Waste Minimization component of the national RecycleMania competition, and adopt three or more associated measures to reduce waste.	Yes	UNF began participating in RecycleMania in 2009 and will continue to participate in the future.
a. Replacing paper documents with online alternatives wherever possible.	Yes	UNF currently has the course catalog, faculty/staff directories and bill payment all available online. UNF also recently released a mobile app.
b. Offering discounts or other incentives for using reusable mugs in campus dining facilities.	Yes	Chartwells currently offers a $0.10 discount if you use a reusable mug or cup.
c. Offering reusable dinnerware and utensils in all sit-down facilities.	Yes	Chartwells uses reusable dinnerware and flatware in all of its sit-down facilities. In addition, they offer a reusable to-go container program in the main cafeteria.
d. Active program to sell or donate surplus property.	Yes	The Property Department at UNF currently collects surplus property and either auctions the items or recycles them when possible. Items are also collected and donated from students when they move out of the dorms.
5. **Provide Inventory, action plan & progress reports to AASHE for public transparency.**	Partially	UNF is committed to making the climate action plan a reality and will be submitting inventories and progress reports throughout the development of the plan.

Appendix B: ACUPCC Commitment Text

American College & University Presidents' Climate Commitment

We, the undersigned presidents and chancellors of colleges and universities, are deeply concerned about the unprecedented scale and speed of global warming and its potential for large-scale, adverse health, social, economic and ecological effects. We recognize the scientific consensus that global warming is real and is largely being caused by humans. We further recognize the need to reduce the global emission of greenhouse gases by 80% by mid-century at the latest, in order to avert the worst impacts of global warming and to reestablish the more stable climatic conditions that have made human progress over the last 10,000 years possible.

While we understand that there might be short-term challenges associated with this effort, we believe that there will be great short-, medium-, and long-term economic, health, social and environmental benefits, including achieving energy independence for the U.S. as quickly as possible.

We believe colleges and universities must exercise leadership in their communities and throughout society by modeling ways to minimize global warming emissions, and by providing the knowledge and the educated graduates to achieve climate neutrality. Campuses that address the climate challenge by reducing global warming emissions and by integrating sustainability into their curriculum will better serve their students and meet their social mandate to help create a thriving, ethical and civil society. These colleges and universities will be providing students with the knowledge and skills needed to address the critical, systemic challenges faced by the world in this new century and enable them to benefit from the economic opportunities that will arise as a result of solutions they develop.

We further believe that colleges and universities that exert leadership in addressing climate change will stabilize and reduce their long-term energy costs, attract excellent students and faculty, attract new sources of funding, and increase the support of alumni and local communities.

Accordingly, we commit our institutions to taking the following steps in pursuit of climate neutrality:

1. Initiate the development of a comprehensive plan to achieve climate neutrality as soon as possible.

   a. Within two months of signing this document, create institutional structures to guide the development and implementation of the plan.

   b. Within one year of signing this document, complete a comprehensive inventory of all greenhouse gas emissions (including emissions from electricity, heating, commuting, and air travel) and update the inventory every other year thereafter.

   c. Within two years of signing this document, develop an institutional action plan for becoming climate neutral, which will include:

      i. A target date for achieving climate neutrality as soon as possible.

      ii. Interim targets for goals and actions that will lead to climate neutrality.

      iii. Actions to make climate neutrality and sustainability a part of the curriculum and other educational experience for all students.

      iv. Actions to expand research or other efforts necessary to achieve climate neutrality.

      v. Mechanisms for tracking progress on goals and actions.

(continued...)

2. Initiate two or more of the following tangible actions to reduce greenhouse gases while the more comprehensive plan is being developed.
   a. Establish a policy that all new campus construction will be built to at least the U.S. Green Building Council's LEED Silver standard or equivalent.
   b. Adopt an energy-efficient appliance purchasing policy requiring purchase of ENERGY STAR certified products in all areas for which such ratings exist.
   c. Establish a policy of offsetting all greenhouse gas emissions generated by air travel paid for by our institution.
   d. Encourage use of and provide access to public transportation for all faculty, staff, students and visitors at our institution.
   e. Within one year of signing this document, begin purchasing or producing at least 15% of our institution's electricity consumption from renewable sources.
   f. Establish a policy or a committee that supports climate and sustainability shareholder proposals at companies where our institution's endowment is invested.
   g. Participate in the Waste Minimization component of the national RecycleMania competition, and adopt 3 or more associated measures to reduce waste.

3. Make the action plan, inventory, and periodic progress reports publicly available by providing them to the Association for the Advancement of Sustainability in Higher Education (AASHE) for posting and dissemination.

In recognition of the need to build support for this effort among college and university administrations across America, we will encourage other presidents to join this effort and become signatories to this commitment.

Signed,

[redacted]

President/ Chancellor Signature

John A. Delaney

President/ Chancellor Name

University of North Florida

College or University

October 26, 2010

Date

Please send the signed commitment document to:

Presidents' Climate Commitment
c/o Second Nature
18 Tremont St., Suite 308
Boston, MA 02108

or fax to: 320-451-1612
or scan & email to: ACUPCC@secondnature.org

Appendix C: Federal and State GHG Legislation

Federal

- The American Clean Energy and Security Act (ACES Act)
- This bill establishes emission caps that would reduce aggregate GHG emissions for all covered entities to 3% below their 2005 levels in 2012, 17% below 2005 levels in 2020, 42% below 2005 levels in 2030, and 83% below 2005 levels in 2050.
- http://www.govtrack.us/congress/bills/111/hr2454/text

State

- [On July 13, 2007] *Executive Order 07-126*
- 10 percent reduction from current [2007] emission levels by 2012, a 25 percent reduction from current [2007] emission levels by 2017, and a 40 percent reduction from current [2007] emission levels by 2025.
- *http://www.epa.gov/statelocalclimate/state/tracking/individual/fl.html*

Appendix D: Key Terms

1. **Association for the Advancement of Sustainability in Higher Education (AASHE):** is an association of colleges and universities working to create a sustainable future.
2. **American College and University Presidents Climate Commitment (ACUPCC):** is an effort to accelerate progress towards climate neutrality and sustainability by empowering the higher education sector to educate students, creates solutions, and provides leadership-by-example for the rest of society.
3. **Carbon Dioxide (CO_2):** is the chemical compound containing one atom of carbon and two atoms of oxygen.
4. **Carbon Dioxide Equivalent (eCO_2):** is the quantity of a greenhouse gas multiplied by a Global Warming Potential (GWP) factor, relative to CO_2. This is the "standard unit" used to quantify various greenhouse gasses.
5. **Greenhouse Gases (GHG):** is any gas that contributes to global warming including, but not limited to, carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.
6. **Intergovernmental Panel on Climate Change (IPCC):** is a scientific body established to provide policymakers with an objective source of information about climate change.
7. **Metric tonne (MT):** is 1000 kilograms or 2204.62 pounds.
8. **Leadership in Energy and Environmental Design (LEED**): is a voluntary, consensus-based, market-driven program that provides third-party verification of green buildings.
9. **Campus Carbon Calculator (CCC):** is a widely used tool developed by Clean Air-Cool Planet to calculate GHG emissions.
10. **Retro-commissioning**: is a process that seeks to improve how building equipment and systems function together in order to enhance overall building performance

Appendix E: Achievements to Date

A list of current university achievements in the field of sustainability was compiled for two reasons, 1) to establish what has been done with respect to sustainability and 2) what can and needs to be expanded on.

Garbage on the Green	A yearly waste audit that quantifies the types of material in UNF's solid waste stream. The program also serves as an educational opportunity to teach the UNF community (students, faculty and staff) about recycling, litter prevention and waste reduction. The findings from Garbage on the Green are used to help improve the efficiency of UNF's solid waste program. The recommendations help reduce the amount of waste going into landfills by identifying the source of waste and educating the University's community about waste reduction and recycling. From its humble beginning in March 2007, Garbage on the green has distinguished itself as a major attraction that now has been incorporating the community, where numerous colleges have replicated the event.
RecycleMania	RecycleMania is an ongoing, 10-week long, friendly competition between colleges and universities nationwide. Each school registered reports on their waste and recycling practices in different categories to rank themselves among other participating peer institutions. UNF is registered in the Waste Minimization category, which encourages overall waste reduction, not just increasing recycling. The goal of RecycleMania is to motivate the campus community to reduce wasteful practices and improve recycling behaviors.
Reducing Water	From 2006 to 2011, UNF Grounds reduced irrigation water consumption by 40 percent and switched to more sustainable water sources (reclaimed water). At the same time, UNF has reduced its demand for irrigational water by investing in a new computerized pump and irrigation control system, repairing of old, leaky pipes and increasing the amount of drought tolerant plants. UNF has also made water softener upgrades, which have an estimated water savings of one million gallons per month. From waterless urinals to low flowing faucets UNF understands the need to conserve one of Florida's most important resources.
Reducing Waste	UNF increased recycling from 96 tons in 2005 to 228 tons in 2011. At the same time, UNF reduced overall trash from 1,234 tons in 2005 to 1,010 tons in 2011. This represents an 18 percent reduction in total waste from 2005 to 2011 and a 238 percent increase in recycling. Much of this success can be contributed to the partnership between Physical Facilities and the UNF Environmental Center initiating programs like Garbage on the Green and RecylceMania, along with placing recycle bins in key areas on campus. Other contributions come from the University purchasing electronic waste recyclers, and efforts to reduce waste during move-in and move-out in the residence halls.
Sawmill Slough	The Sawmill Slough Preserve is a 382-acre wildlife sanctuary that houses a

Preserve	vast array of Florida's native species, some of which are threatened according to the International Union for Conservation of Nature. From its initiation in 2006, UNF has strived to assure that the Sawmill Slough Preserve will persist in its natural condition for the long-term. This mission has brought about a management practice that makes for low-impact construction surrounding the preserve and in-use management that fosters Florida's native species.
Eco-Road	There is one road on campus that runs through the Sawmill Slough Preserve and connects the south part of the campus to the north. It has been engineered with a consciousness of the surrounding preserve. A large culvert was built to allow animals to move easily between the preserve and limit the effect of mortality from cars. There is also limited herbicide use and a current effort to establish a strong community of native's species such that exotics are suppressed.
Public Engagement	• A group of faculty members from UNF, Jacksonville University and Valdosta State University work collaboratively on the St. Johns River Report, which is annual report on the health of the St. Johns River. www.sjrreport.com. • Eco-Adventures, a UNF department works with local K-12 schools to organize educational field trips in the Sawmill Slough Preserve, a 382-acre preserve located on the UNF campus. • The UNF Environmental Center collaborates with various community groups, including the Florida Native Plant Society, the City of Jacksonville and the First Coast Invasive Working group, to bring conferences and workshops to the UNF campus.
Lighten the Load	Lighten the Load is an environmental initiative, where all of the campuses laundry rooms are carbon neutral.
UNF Organic Garden	The Fredrick and Ophelia Tate Ogier Gardens, or commonly referred to as the UNF Organic Garden, was established in 2009. The garden began as a student initiative, which was made possible by a generous donation from UNF alumni Bruce Ogier. What began with six raised beds next to the Wildlife Sanctuary has grown into a half-acre production on the north side of campus with 15 raised beds and three compost tumblers. It currently serves to provide locally grown food to the University, eliminates pre-consumer waste through composting, and serves as a living laboratory for students that are exploring multiple disciplines. Future plans for the garden include educating local elementary schools in organic gardening.
Bag-less bookstore	The UNF Sustainability Committee initiated the bag-less bookstore campaign in 2009, and has halted the UNF bookstore from purchasing some 30,000 plastic bags per year. The program gives students three choices: don't use a bag, purchase a recycled bag, or utilize bags that were brought in by students.
Reducing Energy	UNF Physical Facilities is continuously working to reduce energy demand

and Becoming More Efficient	while saving money. Using state-of-the-art technology, Physical Facilities can monitor, track, and make projections on energy consumption. There are more than 2,500 DDC controllers for UNF's HVAC system, each of which contributes to the understanding of the Universities energy demand. This monitoring system has led to a highly efficient energy system that allows for not only financial savings, but direct GHG reductions.
Leadership in Energy and Environmental Design (LEED)	Leadership in Energy and Environmental Design (LEED) is a voluntary, consensus-based, market-driven program that provides third-party verification of green buildings. UNF has received numerous accolades for its green building practices, much of which is Contributed to President Delaney setting the standard of making all new buildings LEED-certified. This has led to 9 LEED certified buildings, 3 of which are gold.
Campus lighting	University lighting consists of energy efficient bulbs such as T5, T8, CFL, LED and electronic ballasts.

Acknowledgements

About the Authors

James Taylor is the Coordinator of the UNF Environmental Center and chair of Sustainability Committee. He graduated from UNF with a BA in sociology and a minor in history in 2011. He has been with UNF since 2004, first as a student then as an employee. Before joining the UNF Environmental Center's team in 2011, he worked with Dr. Jeffry Will in the Northeast Florida Center for Community Initiatives where he conducted a variety of community based research projects.

Patrick Goodwin is an undergraduate at UNF majoring in biology with a concentration in coastal environmental science. He plans to pursue a master's degree in environmental sciences in the near future. His current research and interest has been in the field of limnology and water management.

UNF Sustainability Committee

Name	*Title*	*Department*
James Taylor, Chair	Coordinator	UNF Environmental Center
John Boozer	Administrative Assistant	UNF Environmental Center
Amy Costa	Coordinator Eco-Adventures	Department of Recreation
David Crabtree	Director	Student Union
Ray de Lugo	Associate Director	Purchasing
Signe Evans	Library Special Services	Thomas G. Carpenter Library
Carmen Franz	Organic Garden Coordinator	Health Promotion
Patrick Goodwin	Student Research Assistant	UNF Environmental Center
Wallace Harris	Associate Director	Physical Facilities
Chuck Hubbuch	Assistant Director & Preserve Curator	Physical Facilities, Landscape & Grounds
Erin Largo-Wight, Ph.D.	Associate Professor	Public Health, Brooks College of Health
Zak Ovadia	Director	Campus Planning, Design & Construction
Becky Purser	Director	Department of Recreation
Radha Pyati, Ph.D.	Director	UNF Environmental Center
	Associate Professor	Chemistry, College of Arts & Sciences
Tony Rossi, Ph.D.	Associate Professor	Biology, College of Arts & Sciences
Jolie Schlieper	Club President	Sawmill Slough Conservation

		Club
Vince Smyth	Director	Auxiliary Services
Lance Taylor	Associate Vice President	Administration & Finance
Chris Wrenn	Associate General Counsel	General Counsel

UNF Environmental Center

The mission of the UNF Environmental Center is to establish, develop and support cross-disciplinary education and research related to the environment. The Center fosters programs for students, faculty and staff to pursue environmental activities through academics, research and extracurricular activities. The Center conducts and supports campus infrastructural projects involving sustainability and the campus's natural environment. The Center develops connections and collaborations among university entities, and between the university and the region. The UNF Environmental Center is the coordinating body for UNF's sustainability efforts. The Center's Coordinator serves as the chair of the Sustainability Committee, which is charged with overseeing the campus climate action plan.