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Environmental Sustainability in Universities of the Gulf South

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Dedication

This dissertation is dedicated to my parents Thomas Joseph Lunn, Sr. and Mary Stogner Lunn. They taught us that all things are possible with faith, hard work and dedication.

Acknowledgment

I would like to thank my committee members for their guidance through this journey. Dr. Bethany Stich was kind enough to chair my committee. Dr. Monica Farris and Dr. John Kiefer provided advice and encouragement to keep moving forward. Thank you all for pushing me to improve and for sharing your knowledge.

I am grateful to my husband Ben for encouraging me to reach the finish line. To my daughter Sarah, I hope you understand why I was always doing homework. Remember that all things are possible with faith, hard work and dedication. You are going to do amazing things.

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Abstract

Universities and colleges are uniquely qualified to serve as community showcases on incorporating environmental sustainability across education, research, operations and leadership. Campuses can serve as living laboratories that benefit students, employees and the local community. The Whole Institution Approach to sustainability promotes active engagement of the entire school in a holistic way. Leadership plays a key role in embedding sustainability across curriculum, research, operations and community engagement.

The purpose of this study was to research universities of the Gulf South to determine what environmental sustainability practices they have in place and examine if there are trends related to university characteristics. Part of the research was to determine sustainability practices in place at institutions of higher education in the Gulf South related to academics, research, operations and leadership. Characteristics of universities such as land grant status, location, research activity, annual enrollment, and highest degree offered were reviewed to determine if certain types of universities were more likely to incorporate environmental sustainability practices.

Keywords: whole institution approach, higher education, sustainability, sustainable development, environmental sustainability

Chapter One: Introduction

"Higher education is at the crossroads having to choose between the path of commodification of knowledge creation and learning focusing on optimization and efficiency with the wellbeing of the economy as a key driver or the path of socio-ecological transitions requiring new forms of research and learning as well as alternative capabilities and values that contribute to the well-being of planet and people" (Wals et al., 2016, p. 36). Institutions of higher education are uniquely qualified to incorporate environmental sustainability in education, research and operations as a showcase for the community. Environmentally sustainable university campuses can serve as a living laboratory benefiting students, faculty, staff and communities. Campus design, management and operations can be used to build bridges among education, research, administration and community engagement.

Cheeseman et al, reviewed the literature in journals dating from 2000 to 2016 that focused on sustainability policy in higher education (2019). Their literature review found a lack of research on how universities can move from policies on sustainability to implementing the practice on their own campuses. They found that advances have been made on sustainability in higher education, but "further efforts are needed to continue to embed sustainability into educational policies throughout operations, governance, research, curriculum, and community engagement domains at all levels of higher education" (Cheeseman et al., 2019, p. 1-2).

University values are embodied in the physical campus and should display congruence with lessons in the classroom and operations of the campus (Zhang et al.,

2016). Younger generations have more ecological knowledge and expect more environmentally sustainable initiatives on university campuses (Kanachanapibul et al., 2014). However, students today can be frustrated at the disconnect between sustainability lessons in the classroom and the lack of sustainable practices on their own college campuses (Ryan, 2018). Student interest in environmental sustainability in institutions of higher education continues to grow, and has resulted in school rankings on the subject. These green rankings may be a competitive advantage in recruiting students (Stafford, 2011).

The history of the American Higher Education system is rooted in the Northwest Ordinance of 1787 when our founders stated that “the means of education shall forever be encouraged” (United States, 1787). Since the establishment of land-grant institutions in the Morrill Act of 1862, the federal government has provided funding to institutions of higher education (United States, 1862). This federal funding created three functional pillars of American universities: education, research and extension (Croft, 2019). Practical areas of education such as engineering, agriculture and extension services have been prioritized in federal funding, which has further shaped the landscape of higher education in the United States.

Federal legislation for higher education began when the country was primarily rural and most of the original “land-grant institutions were located in small towns or rural areas” (Diner, 2013). Therefore, the framework of higher education in America was developed when the country was primarily agricultural in nature. Now that the country is largely urban, and non-agricultural, higher education needs to adapt to also serve urban dwellers who have environmental stressors not in place when the country was founded.

Universities “face increasingly competitive contexts with regards to maintaining fiscal support from state and local governments, securing and leveraging externally funded grant dollars, recruiting and retaining diverse highly qualified faculty, achieving national recognition and ranking, and recruiting and retaining highly qualified students” (Leech, et al., 2014, p. 1030). Research universities have a particularly interesting dynamic, in that faculty members are expected to bring in external funding, but are traditionally allowed to perform research in areas that interest them, without administrative directives such as focusing on sustainability (Anderson and Slade, 2015).

This research focuses on universities in the Gulf South states because they receive less federal research dollars than other areas of the country. The United States National Center for Science and Engineering Statistics data state that the average federal expenditures by state, for federal funding to schools that grant a bachelors or higher degree, was 916 million in fiscal year 2020. Average federal expenditures for states in the Gulf South with Texas was one billion, but without Texas the average per state is only 633 million dollars (United States National Center for Science and Engineering Statistics, 2022). University rankings such as the Carnegie Classification are based upon research funding as reported in the Higher Education Research Development (HERD) Survey (n.d.). These university rankings influence the students who enroll and the employees that apply for positions.

A major goal of this research was to determine if trends exists between university characteristics such as land-grant status, or research funding, and environmental sustainability efforts on campus.

Several researchers agree that a major driver of successful governance of sustainability at institutions of higher education is the “whole institution approach” (Bauer et al., 2021, Ferrer-Balas et al., 2008; Hoover and Harder, 2015; Singer-Brodowski et al., 2019). Using this approach shifts institutional priorities such that they form the foundation of the institution instead of a few subjects or events. The breath of operations including “management, budget, education, professional development, campus design” and other resources are all leveraged to make the institution more sustainable (Gleason, 2021 pg. 36).

The United Nations urges a move from education about sustainability to Education for Sustainable Development (ESD). “All sustainable development programs including ESD must take into consideration the local environmental, economic, and societal conditions” (McKeown, et al., 2006). This approach focuses on teaching critical thinking to students, with a focus on local issues and working with available resources. "Sustainable development (SD) is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987, p 43). Developing an approach that integrates sustainability in “research, teaching, knowledge transfer, and operations is a complex but worthwhile challenge for” institutions of higher education “governance and can eventually transform entire institutions” (Bauer et al., 2021, pg. 2).

A holistic approach to sustainability in universities influences the learning and teaching process while simultaneously embedding sustainability across all aspects of university operations, facility management and governance (UNESCO, 2014b). “In management theory, leadership has always played a pivotal role in any holistic

management model" (Kohl, 2022, p. 227). The whole institution approach requires visionary leaders that infuse organizational culture with sustainability. "However, this transformation in the direction of a Whole Institution Approach requires the adopters to develop new skills and understandings and thus slows down the diffusion process" (Singer-Brodowski, M. et al., p. 11, 2019). Universities that are successful can leverage interdisciplinary ideas to enrich the campus operations and curriculum design.

Purpose of Study

The purpose of this study was to research universities of the Gulf South to determine what environmental sustainability practices they have in place and examine if there are trends related to university characteristics. The research questions included:

1. What sustainability practices do universities in the Gulf South have in place on their campus?
    a. In the Gulf South, how many four-year universities have implemented policies promoting environmental sustainability or signed declarations in support of sustainability in higher education?
    b. What percentage of four-year universities offer degrees, minors, or certificates related to environmental sustainability in the Gulf South?
    c. Do faculty at the university participate in research related to environmental sustainability?
    d. What kind of programs do campus operations have in place to promote environmental sustainability?

2. Are certain types of universities more likely to incorporate environmental sustainability practices on their campus?
    a. Does the land-grant status of a university have a correlation to environmental sustainability efforts?
    b. Are urban or rural campuses more likely to implement environmental sustainability initiatives?
    c. Do universities with a higher level of research productivity have a higher level of environmental sustainability?
    d. Does the annual enrollment size have a correlation to environmental sustainability efforts?
    e. Is there a correlation to environmental sustainability efforts and the highest degree offered at four-year universities?

Chapter one provided an introduction, discussed the purpose of the study and introduced the research questions. A literature review is provided in chapter two. Chapter three discusses the methods of the study. Chapter four provides the results of the study. Chapter five discusses the results of the research. Chapter six provides a conclusion for the research.

Chapter Two: Literature Review

This chapter discussed theories and frameworks related to sustainability ranging from sustainable development in the 1970s to the whole institution approach emerging today. To better understand how American higher education has evolved, legislation that influenced the basic structure of colleges and universities is reviewed. The role of colleges and universities, and the growing need to accommodate urban universities are discussed. A basic framework for an environmentally sustainable campus is provided. Motivations for green campuses and sustainability rankings for higher education are discussed. Younger generations are more interested in sustainability and better informed, which has caused a sustainability shift. There has been an evolution of sustainability agreements used by colleges and universities. Sustainability assessment tools are also available to institutions of higher education to help them monitor and track their progress toward a sustainable campus.

Theories and Frameworks

Sustainable Development

Sustainable development is the incorporation of environmental, social and economic concerns into institutional decision making processes (UNESCO, 2018). This theory has grown in popularity, with the United Nations being a major advocate. Researchers from around the world have advanced the theory and suggested models and frameworks to further develop it. “The theory of Sustainable Development has gone through three stages: the embryonic stage (before 1972), the molding stage (1972–1987), and the developing stage (1987–present)” (Shi et al., 2019, p. 12).

Institutions of higher education began to adopt sustainable development as part of their mission to “ensure a high quality of life for future generations” (Calder, 2003, p.42). Historically, education used traditional education methods to teach students about sustainable development in individual classes. However, coordination of curricula about sustainable education across units and measurements of learning outcomes can prevent discrepancies between theory and praxis (Amador et al, 2015).

Whole Institution Approach

In a whole institution approach, students are viewed as stakeholders who can make meaningful contributions and help transform their campus (Trechsel et al., 2023). Students in self-led projects can experience change agency, self-efficacy and deep learning (Trechsel et al., 2023). Active learning opportunities, service learning and interdisciplinary collaboration improve critical thinking skills in the area of sustainable development. Michael and Zwickle (2021) found that more pioneering and engaging pedagogies improved environmental knowledge retained by students.

“Whole-school approaches also advocate for active and participatory learning… call for the entire school, including students, educators and administrators, to be actively engaged in working towards a sustainable school with ESD fully integrated into the curriculum as the driving factor” (Hargreaves, 2008, p. 69).

Today, the Whole Institution Approach “is understood as a way to move towards sustainability in a holistic way, encompassing teaching content and methodology, influencing the learning process whilst embedding sustainability in all aspects of the institution including facilities, operations and creating interaction with stakeholders in the community, governance and capacity-building” (Kohl, et al., 2022, p.226). To be

successful, this approach requires leadership to play a pivotal role. This is similar to management theory, where any holistic model includes a pivotal role for leaders (Kohl, et al., 2022). Voluntary engagement plays a key role, but commitment from leadership is necessary to implement a whole institution approach to sustainability (Roos and Guenther, 2020).

Gleason et al. propose that three components are needed to implement a successful whole systems approach: spatial (campus buildings and landscape), social (stakeholder interactions) and psychodidactic (teaching methods and content) (2020). Tumbas et al. propose the Fully Integrated System, which is a theoretical model integrating “education, research, university operations, external community and governance” (2015, p. 6209).

Hoover and Harder (2015) advocate for the term “Sustainability in Higher Education” because the term Education for Sustainable Development is associated with curricula rather than a whole institution approach. Hooey et al. “suggest a conceptual framework of a Sustainability Culture as one most appropriate for the more effective incorporation of comprehensive practices” (p.280). A sustainability culture integrates sustainability across the institution in a manner that includes environmental, social and economic issues. In a whole institution approach, flexible management styles can allow people and units in a campus to implement sustainability at a rate that fits their own departmental culture (Hoover and Harder, 2015).

Paradox Model

The Paradox Model is a conceptual framework that acknowledges institutions of higher education are implementing sustainability in an uncertain terrain that can be

contradictory in nature and disorganized. Kemp and Scoffham “identify two fundamental contradictions or paradoxes facing those seeking to engage in sustainability in Higher Education: (1) how to develop authentic sustainability responses within the context of existing higher education structures and processes (2) how to reconcile the demand for immediate action with the much more gradual processes of education” (p. 1).

There is a resistance-alignment paradox in that employees must work within the guidelines of their university, but challenge the way things have historically operated. The second paradox in the model is the fast-slow paradox. Universities use slow responses to focus on learning and fast responses for emergencies, or specific projects. Universities can use the Paradox Model as a tool for reflection and improvement as part of implementing a whole university approach to sustainability (Kemp and Scoffham, 2021).

Heuristic Framework

Gwilliam et al. view becoming a sustainable university “as an integrative activity, whose scope goes beyond what is delivered in the taught curriculum, to encompass cocurricular activity, the lived experience of university life and the educational role of HEIs in their local community and through stakeholder relationships” (2023, p. 2). Because teaching, research, and other areas of campus support and interact with each other, a holistic approach is needed for cross-cutting efforts.

The framework addresses the areas of capacity and commitment. University commitment is addressed by management’s support, and demonstrated in written policies and procedures. University capacity includes the financial resources, personnel, knowledge and skills available at the university to support the sustainability efforts. The

framework consists of four scenarios: Pockets of Practice (low commitment – low capacity), Emerging Agenda (high commitment – low capacity), Off the Agenda (low commitment – high capacity) and Integrated Impact (high commitment – high capacity) (Gwilliam, 2023). Universities can measure progress, or regression, in sustainability as resources and priorities change. Working together administration and the campus community are both needed to implement a sustainability reformation. The heuristic framework is meant to aid universities efforts to integrate sustainability in a holistic way across all facets of the university.

Social Responsibility

Some researchers have proposed that universities should follow the corporate model of Social Responsibility and post reports on their websites for stakeholders to review. Social Responsibility means not only incorporating sustainable business practices, but also adopting ethical behaviors that benefit the greater good and responding to the needs of stakeholders. Sari et al. promote Social Responsibility being implemented in institutions of higher education because they are behind other industries in sustainability efforts, despite their role in knowledge transfer (2023). Sanchez et al. note that American universities have developed some policies in the areas of Social Responsibility around their teaching, research and administrative operations. However, they do not prioritize the needs of stakeholders and do not effectively communicate their progress in social responsibility (Sanchez, 2013).

Sustainable Transformative Learning

Palma and Pedrozo “propose a complex matrix for the analysis of sustainable transformative learning (CMASTL)” (2015, p. 817). Their model addresses processes

related to change, management and teaching within the organization as a cohesive entity. In this model, administrators and teachers must remain open to change and use the campus to reinforce classroom teachings.

Themes

There are clear themes across the theories and frameworks for institutions of higher education to integrate sustainability in a whole institution approach. Leadership must prioritize sustainability at the highest levels of the university. Universities should include sustainability in all business decisions and operations. Sustainability needs to be integrated in curricula, research, operations, management and community engagement. A culture of sustainability empowers multiple stakeholders, including students, faculty, staff and administrators and helps them develop the skills necessary for change. Monitoring and evaluation of efforts is needed to provide a continual process for improvement. Reporting on efforts and celebrating successes can reinforce the culture shift, but also improve community engagement.

To understand the roles of American colleges and universities, it is important to understand the history of the legislation that created and funded them. The United States has a long history of support for public education that predates its formal incorporation.

History of American Higher Education

Precedent for public support of education was set by the Confederation Congress, which later evolved into the United States Congress. Encouragement for public support of schools and education were expressed when the Confederation

Congress created the Northwest Territory in 1787 (United States, 1787). Congressional legislation encouraged universities to focus on practical application of knowledge that would benefit both individual students and the greater society.

Northwest Ordinance of 1787

The Confederation Congress wrote in the Northwest Ordinance of 1787 that "religion, morality, and knowledge, being necessary to good government and the happiness of mankind, schools and the means of education shall forever be encouraged" (United States, 1787). While this ordinance did not provide federal funding for education, it did establish a precedent of support. Congressional support for public education in later years grew to have significant financial commitment. Federal funding for institutions of higher education was not provided until the Morrill Act of 1862. Federal legislation not only provided funding, but included mandates on how to spend those funds.

Morrill Act 1862 (Land-grant Institutions)

Representative Justin Smith Morrill of Vermont did not attend college, and stopped his formal education at age fifteen (Peshek, 2018). Morrill, “inspired by his own lack of a formal education, authored the legislation that would become the First Morrill Act to provide an ‘opportunity in every State for a liberal and larger education to larger numbers, not merely to those destined to sedentary professions, but to those needing higher instruction for the world’s business, for the industrial pursuits and professions of life’” (U.S. Congress, 2012).

Morrill sponsored a bill “donating public lands to the several States and [Territories] which may provide colleges for the benefit of agriculture and the Mechanic arts" that became the first federal funding provided to higher education in the United States (U.S. Congress, 1862). Congress passed Morrill’s original land grant act in 1859, but President James Buchanan vetoed it. Buchanan was a Democrat who believed that education was a state issue rather than a federal one (Peshek, 2018).

During the American Civil War, Morrill submitted an amended bill to expand the educational focus to fund colleges “where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the States may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life” (U.S. Congress, 1862). After adding military tactics to the act, Congress passed it a second time and sent it to President Abraham Lincoln, a Republican. This demonstrates that funding for higher education was supported by both political parties since the inception. The bill was signed into law in 1862. Southern states were excluded from receiving funding until well after the war because the act stated that “no State while in a condition of rebellion or insurrection against the government of the United States shall be entitled to the benefit of this act” (U.S. Congress, 1862).

The Morrill Act of 1862, or the Land-Grant College Act of 1862, provided states with federal land grants to establish public colleges (Peshek, 2018). Each state received thirty thousand acres of federal land for each senator and representative in Congress

(U.S. Congress, 1862). States that did not have federal land available within their borders were given land in other states that could be sold to establish public colleges. These new “land grant” institutions opened up higher education to working families that would not have traditionally been financially able to attend colleges or universities. “The Morrill Act became law at a time when most colleges in the United States were private and committed to classical education for elite gentlemen” (Diner, 2013). “The traditional, classical college curriculum focused on philosophy, on mathematics for mental training, on Greek and Latin, and the classics produced in those languages” (Reynolds, 1992). The Morrill Act also opened higher education to women: as public institutions opened in the western states between the years 1861 and 1880 seventy-one percent accepted female students (Khan, 2020). It was economical for new schools to be co-ed, and new teachers were needed for the new schools being built out west. By 1880 American higher education was one third female students (Khan, 2020). After the Civil War strides were made in racial equal access to education, in addition to class and gender access.

Originally around ten million acres of Native American tribal lands were taken from indigenous peoples and given to states, who were authorized to develop or sell the land to fund institutions of higher education. “Recent scholarship has explored the relationship between the public lands provided for the land-grant university system and the forced removal of Native people from their lands. Several land-grant universities have recognized this history in land acknowledgement statements that acknowledge displaced tribes as traditional stewards of the land” (Bickell, 2022, p. 2).

With later expansions the allocation grew to more than one hundred million acres of land being allocated to fund land-grant universities. The focus of the Morrill Act of

1862 was to teach agricultural and mechanical subjects in colleges and universities and marked the inaugural federal funding to higher education (U.S. Congress, 1862). Land grant universities were “instituted to serve specific needs appropriate to the nation’s character at that time” (National Research Council, 1995, p. vii.).

These schools reflected the primarily rural population and the national economic dependence upon farming. “The overwhelming majority of the land-grant institutions were located in small towns or rural areas” (Diner, 2013, p. 62). As national priorities changed and population shifted, additional legislation was formulated to expand educational priorities beyond agriculture.

Hatch Act of 1887 (Agricultural Experiment Stations)

In 1887 Congress passed the Act of 1887 Establishing Agricultural Experiment Stations; it is commonly referred to as the Hatch Act after the representative that introduced it (U.S. Congress, 1887). The purpose of the act was “to aid in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with agriculture, and to promote scientific investigation and experiment respecting the principles and applications of agricultural science” (U.S. Congress, 1887). The Hatch Act provided permanent funding to land-grant universities to create a system to develop and train people in agricultural science. Originally “the sum of fifteen thousand dollars per annuni is…appropriated to each State” in federal funding in support of each states experiment station (U.S. Congress, 1887).

Research experiment stations could work with their state land grant university to solve problems of particular relevance to their regional industry needs. By creating

agricultural experiment stations and pairing them with land grant universities, Congress made research a major function of land-grant universities. Research at American universities has grown exponentially since the Hatch Act was passed. By 2022 the appropriation grew to $184,064,762 for the Hatch Act of 1887 Regular Research Program and $60,292,909 for the Hatch Act of 1887 Multistate Research Program (National Institute of Food and Agriculture, 2023).

Because the funding requires a one-to-one match by a non-federal source, this means hundreds of millions of dollars were available for research under the Hatch Act in federal fiscal year 2022. Congressional legislation, and the associated funding, reinforced the desire for universities to focus on practical application of knowledge that would benefit both individual students and the greater society.

Morrill Act 1890 (Historically Black Colleges and Universities)

Almost three decades later, the second Morrill Act of 1890 was signed into law by President Benjamin Harrison. This was “an act to apply a portion of the proceeds of the public lands to the more complete endowment and support of the colleges for the benefit of agriculture and the mechanic arts established under” the first Morrill Act of 1862 (U.S. Congress, 1890). This act provided $15,000 a year to each state and territory to enhance, or create colleges and universities. The funds were to increase one thousand dollars a year for ten years if the terms and conditions of funding were adhered to. After ten years each state and territory would receive twenty-five thousand dollars a year for “instruction in agriculture, the mechanic arts, the English language and

the various branches of mathematical, physical, natural and economic science, with special reference to their applications in the industries of life" (U.S. Congress, 1890).

Only Union states were originally funded under the Morrill Act of 1862, although after the Civil War all states eventually were able to participate and receive funding. The Second Morrill Act of 1890 was aimed toward former Confederate states, and was meant to ensure that race did not prohibit attendance from colleges and universities (U.S. Congress, 1890). Colleges and universities were created to best serve the nation's needs at the time and "reflected the nation's largely rural population and farm-economy base-and the racial separateness of the time" (National Research Council, 1995 p. vii).

This 1890 act had two main requirements from states. The first is that funds were "to be applied only to instruction in agriculture, the mechanic arts, the English language and the various branches of mathematical, physical, natural and economic science, with special reference to their applications in the industries of life and to the facilities for such instruction" (U.S. Congress, 1890). Secondly, no funds would be paid to states that used race for admission standards, unless there was an "establishment and maintenance of such colleges separately for white and colored students…if the funds received in such State or Territory be equitably divided" (U.S. Congress, 1890). This second requirement resulted in the establishment of Historically Black Colleges and Universities throughout the Southern states.

In the fall of 2023, the U.S. Secretary of Education and the U.S. Secretary of Agriculture issued letters to sixteen governors. Data in the National Center for Education Statistics showed funding disparities between 1862 and 1890 land grant

institutions (U.S. Department of Education, 2023). Of the eighteen states with HBCU land-grant universities, only Delaware and Ohio were found to have funded their universities equitably.

Smith-Lever Act of 1914 (Agricultural Extension Services)

The Smith-Lever Act of 1914 provided “for cooperative agricultural extension work between the agricultural colleges, in the several States receiving the benefits of an act of congress approved July 2, 1862 and of acts supplementary thereto, and the United States Department of Agriculture” (U.S. Congress, 1914). Land grant universities ran these cooperative extension systems in exchange for additional federal funding and a mandatory state match. Initial funding was $480,000 a year, or $10,000 per state. “An additional sum of $600,000 for the fiscal year following…and for each year thereafter for seven years a sum exceeding by $500,000 the sum appropriated for each preceding year, and for each year thereafter there is permanently appropriated for each year the sum of $4,100,000 in addition to the sum of $480,000” originally provided (U.S. Congress, 1914). The Smith-Lever Act added additional funding to Land Grant universities in furtherance of research and extension services.

The additional sums were to be allotted based on “the proportion which the rural population of each State bears to the total rural population of all the States” and the state had to provide a one to one match for the federal funds (U.S. Congress, 1914). The American urban and rural population was nearly equal at the time the Smith-Lever Act became law, but this legislation continued to focus on rural areas. This work consisted of “instruction and practical demonstrations in agriculture and home

economics to persons not attending…colleges…through field demonstrations, publications, and otherwise" (U.S. Congress, 1914). President Woodrow Wilson signed the bill into law May 8, 1914.

The Unites States created extension agents in each county to disseminate information to local producers. In their travels, extension agents would also find current issues to bring back to researchers. Extension work helped farmers learn new techniques for improving their operations, furthering the federal priority of teaching. However, their teachings were informed by the newest scientific methods developed by current research developed in the experiment stations.

Smith-Hughes Vocational Education Act of 1917

Congress approved the Commission on National Aid to Vocational Education on January 20, 1914 authorizing the president to form a commission "to consider the subject of national aid for vocational education and report their findings" (United States, 1914). President Wilson made a progressive move for the time and appointed two women to serve on the commission: Agnes Nestor was president of the International Glove Workers Union and Florence Marshall was director of the Manhattan Trade School. The Commission's recommendations served as a catalyst for the Smith-Hughes Act of 1917. President Wilson signed the act on February 23, 1917. The Smith-Hughes Act provides federal support to high school students by "preparing them for vocations, and was reflective of the hands-on learning that characterized research and extension since the 1800's" (Gadd, 2015).

This act marked a turning point of increased federal oversight of education. First, states were required to match and report on federal funding for vocational education. By the early 1950s states spent $85 million, or more than three times the amount of federal funding (Carleton, 2002). Second, federal oversight and reporting greatly increased. To qualify for funding states had to submit detailed plans, financial reports, and certifications of compliance that established a federal model (Carleton, 2002). Third, the act created the Federal Board for Vocational Education. This was “a first-ever national board” for education (Carleton, 2022).

Agricultural subjects, trade, industrial subjects, home economics and vocational teachers were the focus of the act. This continued the federal focus on practical education to ensure graduates could acquire gainful employment.

National Sea Grant College and Program Act of 1966

The Sea Grant program was modeled after the land grant program and was signed into law by President Lyndon B. Johnson on October 15, 1966. The act aimed to provide support to university-based research, education and extension services related to ocean, coastal and Great Lake resources. Contracts and grants to “suitable institutes, laboratories and public or private agencies” were allowed to be funded under the act (U.S. Congress, 1966). Congress declared that marine sources were a “largely untapped asset” for the United States (1966). Sea Grant funding supports “marine advisory programs with the object of imparting useful information to persons currently employed or interested in the various fields related to the development of marine resources, the scientific community, and the general public” (U.S. Congress, 1966).

Sea grant programs build upon the basic organization of land grant institutions for research, education and outreach. Institutions can be both a land grant institution and a sea grant institution, which allows them to build upon existing outreach networks. Unlike some earlier funding such as the Hatch and Smith-Lever Acts, this legislation does not require the program to be located at a land grant university. Congress deemed it “in the national interest of the United States to develop the skilled manpower, including scientists, engineers, and technicians…facilities and equipment necessary for the exploitation of these resources” (U. S. Congress, 1966).

The Sea Grant network has grown to include thirty-four programs that encompass every Great Lake and coastal state, plus Puerto Rico and Guam (NOAA, 2018). Federal funding was once again used to encourage universities to address areas the government wanted to develop with a sea focus in the sixties, and then a space focus in the eighties.

National Space Grant College and Fellowship Program of 1987

Increasing the “understanding, assessment, development and utilization of space resources by promoting a strong educational base, responsive research and training activities, and broad and prompt dissemination of knowledge and techniques” was the basis of the Space Grant legislation (U.S. Congress, 1987). All fifty states, the District of Columbia and the Commonwealth of Puerto Rico each have a consortium and the combined network exceeds “850 affiliates from universities, colleges, industry, museums, science centers, and state and local governments” (NASA, 2023). President Ronald Reagan signed the program into law on October 30, 1987. This legislation

continued the precedent set by the sea grant program and does not require the new program to be established at a land grant institution. Because the space grant program is established as a consortium it includes rural and urban institutions of higher education.

The Space Grant program builds upon the basic organization of land grant institutions for research, education and outreach. Institutions can be a land grant institution, a sea grant institution, and a space grant institution. All of these programs allow universities to build upon existing outreach networks. Consortia provide fellowships for science, technology, engineering and math students in addition to funding faculty development.

Equity in Educational Land Grant Act of 1994 (Tribal College Program)

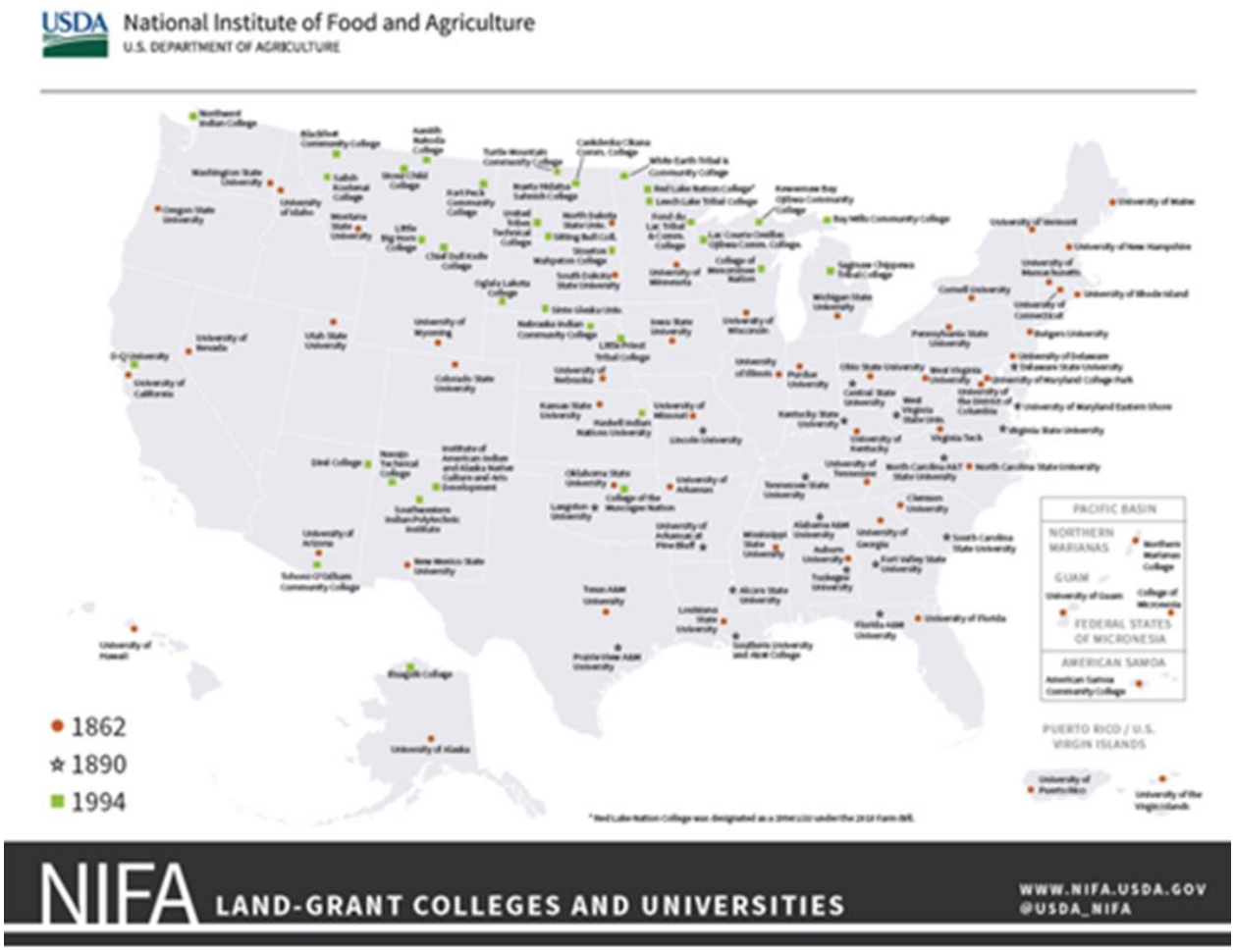
Native American tribally controlled colleges and universities were granted land-grant status by Congress in 1994. Tribal land grant institutional missions were similar to other land grant universities regarding teaching, outreach and research and focus on agricultural sciences. Unlike the Morrill land grant institutions, tribal schools did not receive land grants. Instead, “the Native American Institutions Endowment Fund is authorized to be used for facility renovation, repair, construction, and maintenance, in addition to other authorized purposes” (U.S. Congress, 1994). Thirty-six tribal institutions are recognized by the act and are located in the mid-west, southwest, rocky mountain region and pacific region. There are no tribally funded universities in the southeast or northeast region of the country (Croft, 2022).

The U.S. Department of Education lists thirty-two of the tribal colleges and universities as being currently accredited, one up for accreditation and three in associate status (2023). “These programs include 181 associate degree programs at 23 TCUs, 40 bachelor’s degree programs at 11 TCUs, and 5 master’s degree programs at 2 TCUs” (U.S. Department of Education, 2023). Federal funds for research related to experiment stations and extension services are not available to 1994 institutions so they receive less federal funding than 1862 or 1890 institutions (Croft, 2022). The lack of federal funding for research related to experiment stations and extension services may play a role in the historical absence of doctoral programs (see Table 1) and the focus on associate’s degrees in Tribal institutions. Navajo Tech offered the first doctoral program at a Tribal institution beginning in the fall of 2023 (Navajo Technical University, 2024). Their doctoral “program is designed to prepare students to become leaders and experts in the field of Diné culture and language sustainability, with a focus on preserving and revitalizing the Navajo language and culture” (Navajo Technical University, 2024).

Distribution and Funding of Land Grant Colleges and Universities

A map from the National Institute of Food and Agriculture shows the distribution of land grant colleges and universities (Figure 1). Tribal land grant universities are clustered primarily in the mid-west, and there are none located in the Gulf South states.

Figure 1. Land Grant Colleges and Universities (NIFA, 2022)



Through the land grant legislation acts, one or more land grant colleges or universities are located in each state. Land grant institution types have discrepancies regarding the type of student with 1862 institutions having the highest percentage of graduate students and 1994 institutions having the lowest percentage of graduate students. Federal funding for research and extension is only provided to 1862 and 1890 institutions, which leaves Tribal Land Grant institutions with significantly lower levels of funding as shown in the table below.

Table 1. Selected Metrics by Land Grant Institution Type

Metric	1862	1890	1994
Number of Institutions	57	19	35
Undergraduate Students	1,534,525	89,544	23,481
Graduate Students	446,014	14,734	273
Total Students	1,980,539	104,734	23,754
Fed. Capacity Funding: Research, Extension Programs	$ 574,000,000	$ 124,000,000	$ -
Fed. Capacity Funding Per Student	$ 290	$ 1,189	$ -
Fed. Capacity Funding Per Institution	$ 10,070,175	$ 6,526,316	$ -
Source: Croft, 2022			

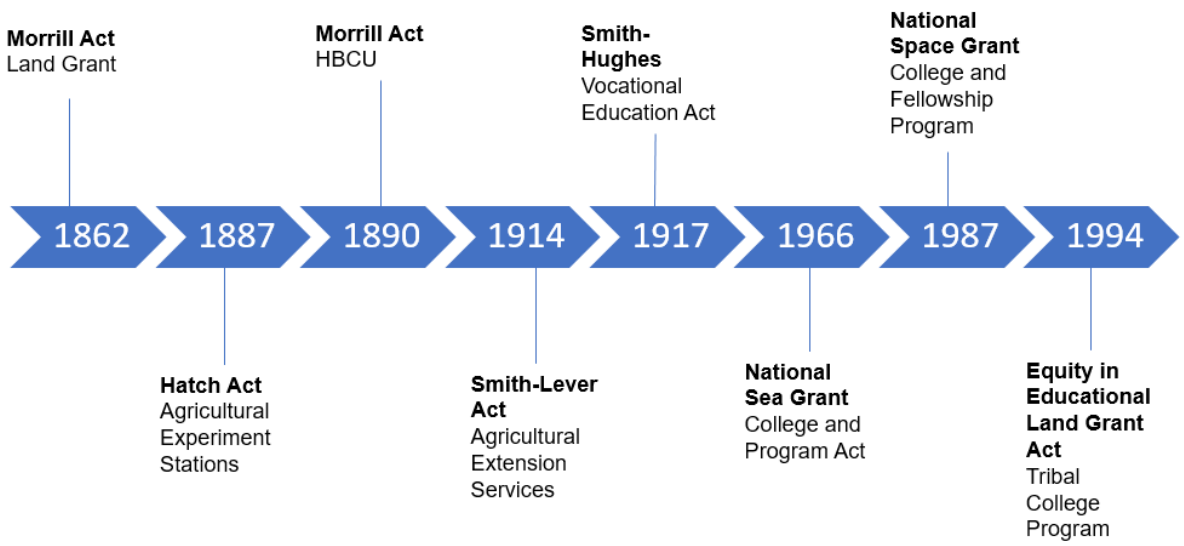
American universities have three functional pillars as the result of federal funding: education, research and extension (U.S. Congress, 2017). The original framework was established when the country was primarily rural and the economy was based on agriculture. In keeping with this historical precedence, since the country has become more urban, and less agricultural, the role of universities should be adapted to serve the needs of the current and future population.

Role of Colleges and Universities

The United States public higher education system grew from the first Morrill Act of 1862 that established land-grant universities. Practical teaching of agricultural and mechanical subjects in colleges and universities, that was available to more citizens regardless of class, was the primary focus of the law that marked the foundational federal funding to higher education (U.S. Congress, 1862). Agricultural experiment stations were added to land grant institutions in the Hatch Act of 1887. This permanent funding made cooperative research a function of land grant universities, and strengthened the funding system for universities to focus on agricultural sciences with a

pragmatic application of knowledge. With the Morrill Act of 1890, Congress required land grant institutions to not use race in admission standards, or to provide for a separate but equal institution. This mandate resulted in the formation of Historically Black Colleges and Universities (U.S. Congress, 1890). The areas of teaching, research and outreach were also slightly expanded to include English, math, and science but still focused their applications on practical application of knowledge. Figure 2 lists selected federal legislation and the programs created by that legislation.

Figure 2. Timeline of Federal Legislation



Agricultural Extension Services were added to land grant university funding via the Smith-Lever Act of 1914. This legislation created a network of extension agents to educate rural Americans regarding advances in agricultural topics with the goal of increasing agricultural productivity. Precollegiate vocational education with a focus on agricultural, mechanical and home economics was funded via the Smith-Hughes Vocational Education Act of 1917. This legislation marked a turning point with federal

funding because it imposed a series of requirements upon states as a condition of receiving funds. The Smith-Hughes Vocational Education Act required a state financial match, required reports regarding activities and created the first national education board (Carleton, 2022).

Sea Grant and Space Grant programs expended federal funding to new areas of teaching, research and outreach but still had a focus on universities and colleges preparing the populace for jobs and economic contributions to the republic (U.S. Congress, 1966 and 1987). Tribal land grant institutions were recognized in the Equity in Educational Land-Grant Status Act of 1994. Colleges and universities run by Native American tribes were granted some of the federal funding previously granted to 1862 and 1890 institutions, but have lower federal funding support and the educational focus in those institutions is primarily vocational (Croft, 2022).

Federal legislation formed the foundation of the three functional pillars of land-grant institutions of higher education (Bickell, 2022). The Morrill Acts in 1862 and 1890 made teaching the first pillar of land-grant institutions, with a focus on practical subjects for the time such as agriculture, engineering and military studies. Additional legislation added both research and extension services. This firmly established land-grant institutions as leaders of original agricultural research, and ensured that research was disseminated to the public via agricultural extension services (Bickell, 2022). From a practical point of view, it makes sense to invest in food security and technological progress that will result in economic development. Farmers who produce more food on their land increase food available for people, livestock and industry so the economic impact is felt nationwide. From a practical point of view, it also makes sense for

universities to align their teaching, research and administration around such topics as sustainability.

Sustainability topics have been incorporated into teaching, but the systematic incorporation of experiential learning into the curriculum so that students have both the academic knowledge and practical application experience to be successful upon graduation is lacking (Kong, 2021). Researchers are tackling sustainability across disciplines, but the funding levels across states and institutions vary greatly. Incorporation of these best practices into the operation and management of the college and university campus itself is lacking (Cheeseman et al., 2019). Federal funding has not historically required institutions of higher education to incorporate sustainability best practices into their own operations.

College and university campuses could be living labs where students from all disciplines have inter-disciplinary projects to improve where they live and learn. As many industries move toward project-based work, so too could learning in universities (Moscardini et al., 2022). For instance, planning and engineering students can work with facilities to identify and implement energy savings projects, or business and education students can work with the provost to identify curriculum improvements for students.

Many institutions of higher education are small cities that could use their campus to display best practices in education, research and outreach. Higher education funding legislation grew from the need to improve farming to include other national priorities such as space exploration. With increased population and urbanization, environmental sustainability could be the next national priority for funding in higher education, this is especially true for urban universities.

Urban Universities

One definition of an urban university is that twenty per cent or more of the students attend part time, it is located in a city where the population exceeds 250,000, and it offers graduate or professional degrees (Spicer,1976). Using this definition, Spicer identified seventy-seven urban universities in 1976. Urban universities now represent sixty-eight percent of higher education institutions and serve over twenty million students (APLU, 2023). Migration to urban areas, and urban sprawl have now made rural universities the minority institution in higher education. Other urban universities started as trade or technical schools and grew into universities over time. Urban universities typically have larger student populations, and students are more likely to live near the university so they can work and attend school. Urban universities were established to meet the needs of the growing urban population, and to be near available resources that allowed universities to assist economic development and meet quality of life needs. Since the Smith-Lever Act was passed, the population has become more urban. According to the American Council on Education fifty-three land grant institutions are in cities, thirty-three land grant institutions are rural, and the remaining twenty-six are in towns or suburbs (2023).

"As American cities experienced extensive migration of poor people, particularly blacks from the American south and Puerto Ricans in the years after World War II, and the simultaneous out-migration of white middle-class people to burgeoning suburbs, public officials and civic leaders expressed increasing concern about what by the 1960s would be called the urban crisis" (Diner, 2013). A conference was held in 1954 to

explore how urban universities could meet the needs of their communities and the agricultural extension was discussed as a potential model (Diner, 2013). In 1958 at the Association of Urban Universities meeting, the keynote speaker suggested the Morrill Act be updated to reflect the fact that the country was more urban than agricultural (Diner, 2013). In 1965 congress began to include funding for antipoverty and urban extension programs in urban areas and increased federal aid available to low income college students. The Higher Education Act of 1965 created federal programs to provide financial aid to students, gave low-interest loans to students, and provided funding to help low-income students prepare for college or university (Lee, 2010).

"Unlike many rural places where Extension is a well-known and trusted community resource, urban residents often do not know of or consider Extension as a source of education, problem-solving, community development, or collaboration" (Lindemann et al, 2022). This means that extension services are only partially serving their mission because a large part of the population is not directly using their services. "Although there are many similarities in Extension's work across all geographic settings, dynamic situations in cities and large metropolitan areas present unique challenges and opportunities as Extension extends a history of innovation" (Fox et al, 2017). This does not mean that agendas for rural areas should be abandoned, but it does mean that new methods are needed for urban areas. Extension services for rural areas may cover traditional agriculture, whereas urban extension services may cover topics such as urban gardening, environmental sustainability or waste management.

Land grant universities have shaped American views on higher education and leaders of higher education have requested funding to enable urban institutions of

higher education to do for cities what land grant universities had done to benefit rural areas (Diner, 2013). Robert Wood was a professor of political science who wanted to create urban observatories. “Natural scientists, he argued could use field stations, data centers, and observatories to collect systematic data” (Diner, 2013). If urban universities were funded to conduct research in a systematic manner, then reliable data could be acquired to address urban matters in a like manner to what agriculture stations had done. In 1966 Dr. Wood went to work for the newly formed U.S. Department of Housing and Urban Development (HUD); one of his first acts was to contract with the National Research Council and begin to establish the Urban Observatories. The program was declared a success and federal funding ended in 1974 with the expectation that local funds would be used to continue the initiative. Instead, the observatories were no longer around by the end of the decade (Diner, 2013).

In 1978 the House introduced H.R. 10782, the Urban Grant University Act, “for (1) development of urban-oriented educational, research, or service programs; and (2) assistance in carrying out such programs.” President Jimmy Carter signed it into law, but funds to implement were not appropriated by Congress. In 1994 President Clinton established an Office of University Partnerships under HUD to support involvement of urban universities in local revitalization projects; to create urban scholars; and to support teaching, research and service collaborations between universities and federal agencies (Diner, 2013).

Universities have broadened their extension services to include urban extension services. The National Institute of Food and Agriculture encourages universities to serve both rural and urban areas with their extension services; capacity grants ensure that

land grant universities have funding for research and extension services. Since most land grant universities are now in non-rural areas this benefits urban communities. In the Gulf South there are twelve land grant institutions and only one is in a rural area, the other eleven are in cities or towns; there are 996 total institutions of higher education and only fifty-eight are in rural areas (IPEDS, 2023). Capacity grants are funded via statutory formulas by the federal government, and provide universities with a reliable source of funding to provide services. This is in stark contrast to most of the grants offered by federal agencies, which are competitive in nature. Competitive grant funds are for set periods of time which makes creating and maintaining programs difficult. In addition to providing funds to universities, federal funding has supported urban students via workforce development programs, internships and financial aid.

Extension directors and administrators formed the Extension Foundation to advance the importance and long-term value of urban extension activities by being responsive to local extension needs, including urban areas (Extension Foundation, 2023). Rutgers Office of Urban Extension and Engagement works to “coordinate and facilitate programming to address food security, individual and community health, resource stewardship, urban agriculture and food chains, environmental planning and design, and other concerns facing” urban communities (2023). Ohio State University has extension offices in every county and targets their programs to the city and neighborhood they are serving, to meet local needs. These are but a few examples of university extension offices serving urban community needs.

University research stations and farming demonstrations are usually in rural areas. However, some extension services use technology to enable “farmer-to-farmer

networking and community engagement for a range of urban and rural stakeholders that represent…modern constituencies" (Parikh et al, 2022). The state of New York is eighty-seven percent urban, and forty-four percent of the population is in New York City (Parikh et al, 2022). Its' extension services have experimented with using virtual reality and other technology to help urban areas become more sustainable and resilient while increasing the civic engagement of people who live in cities.

Julie Fox states that the various service providers, nonprofit organizations and government agencies in urban areas may serve as competitors or partners to extension agents (2017). Cornell University has extension offices in New York City that leverage technology to map program activities. Geographic Information Systems (GIS) technology is used in New York City to track programming, identify gaps in coverage and develop partnerships (Tiffany, 2017). This is an example of a program that allows extension services to collaborate with more internal and external partners to better serve their community, and may serve as a model for other urban universities.

Calls for improved engagement of extension services started in the 1960s and there are still calls for overall improved community engagement in higher education. Making more connections in urban areas is necessary to meet the ideal of the American public university. To "bring the university to the people and engage the people in the workings of the university" will require updated methods of teaching and engaging with urbanites (Lindemann, 2022). Now that more than eighty per cent of the population resides in urban areas, funding for universities and program offerings must prioritize urban needs (Tiffany, 2017).

Defining an Environmentally Sustainable Campus

The Brundtland Commission, in 1987, “defined sustainability as meeting the needs of the present without compromising the ability of future generations to meet their own needs” (McKeown, 2006, p.10). Sustainability is based upon the very simple premise that everything needed for our well-being depends upon our natural environment. Living sustainably means living in harmony with nature on behalf of future generations. Higher education must interconnect education, research and operations to fully realize their mission. Urban campuses, in particular, should serve as a role model for environmental sustainability to students, employees, local businesses and community members.

University campuses can be designed to have environmentally sustainable operations that promote a more sustainable lifestyle for the campus community and may save money over time. Many universities now showcase their sustainability initiatives.

> “Whether this ranges from an ecological design of new campuses to single-issue initiatives (e.g. a paper-cutting campaign or a sustainable transport initiative); from systems approaches such as sustainable procurement or ethical investment to life-cycle analysis (resource use, material and energy flows); or from the low-hanging fruits of campus sustainability to the more challenging, systemic-institutional issues, ‘greening the campus’ has become mainstream and a force in the economic-fiscal sustainability of universities which can no longer be ignored” (Beringer and Adombent, 2008, p. 608).

A gap in the literature prompted Sugiarto et al., to perform a systematic review of peer reviewed literature for sustainable campuses. They identified three broad strategies universities used to create sustainable campuses. Behavior strategies included leaders' commitment to engage the campus community and build green engagement; learning tool strategies included leveraging technology to create environmentally friendly teaching methods and creating green offices; and physical facility strategies to improve energy efficiency, integrated trash management and green building standards (Sugiarto et al., 2022). Using tactics within these three strategies can facilitate integrating environmental best practices across all administrative aspects of the university in a manner that supports the educational mission.

One of the most common sustainability projects implemented at universities is waste management related to the triple R concept of reduce, reuse, recycle (Aceves-Avila and Berger-Garcia, 2019). Teaching students to reduce waste is a habit that they can carry with them for the rest of their lives. Maddox et al. found that changing habits and encouraging public participation is just as important as technical or economical facets of waste management (2011). They also found that students who learn the triple R have inter-generational influence that drives change to improve waste management in families and communities.

"Most of the attention to date has focused on sustainability measures that save money, and yet only a small number of institutions have created mechanisms to ensure that these savings are used to help finance sustainability measures with lower rates of return" (Calder and Dautremont-Smith, 2009, p. 97).

Green infrastructure is one area of sustainability campuses can incorporate into the management of their outdoor spaces. Congress defines green infrastructure as “the range of measures that use plant or soil systems, permeable pavement or other permeable surfaces or substrates, stormwater harvest and reuse, or landscaping to store, infiltrate, or evapotranspirate stormwater and reduce flows to sewer systems or to surface waters” in the Water Infrastructure Act (2019).

Green infrastructure is a cost-effective approach to managing water that promotes resiliency and provides other community benefits. The Green Infrastructure Center describes green infrastructure as the “interconnected natural systems and ecological processes that provide clean water, air quality and wildlife habitat” (Green Infrastructure Center, 2018). Stormwater runoff from developed areas is a major contributor to water pollution according to the Environmental Protection Agency (Biting and Kloss, 2008). Urban areas have roofs, sidewalks, streets and parking lots that do not allow for the natural absorption of water into the soil and destabilize the water table. Traditional water management such as gutters, storm sewers and other engineering water management systems discharge untreated stormwater into natural local bodies of water. Polluted stormwater carries trash, heavy metals and bacteria while causing erosion and flooding in local waterways. Metropolitan areas and urban universities have acres of non-permeable parking and roofing systems that contribute to water runoff. Best practices for green infrastructure could be implemented on university campuses as examples for local governments, businesses and citizens to install through the rest of the city.

Whitman and Eisenhauer (2020) declared that green infrastructure, when used solely as a stormwater management technique, results in a missed opportunity to leverage the practice more broadly. It can be used to create an interconnected infrastructure which provides multiple benefits, such as habitat for increased biodiversity, better air quality, temperature regulation, recreational space, and more. Incorporating green infrastructure projects into the urban campus operations could provide students with a learning laboratory for their studies and should be interdisciplinary in nature.

Universities can benefit from reductions in sewer and water costs by implementing green infrastructure projects. Cisterns or water barrels provide water for car washing, gardening, and other outdoor requirements. Incorporating native plants in landscaping lessens reliance on fertilizers and other chemicals because native plants are adapted to the region. Eliminating or reducing sod lawns reduces the use of fossil fuels used by weed eaters and lawn mowers. Improved air quality, noise reduction, and reduction of urban heat load are all green infrastructure benefits (US EPA, 2017).

Garrison and Hobbs (2011) literature review shows that green infrastructure is a cost-effective method to reduce stormwater runoff, which provides additional economic benefits that are not provided by gray infrastructure alternatives. The cost effectiveness of green infrastructure varies and, in some circumstances, it may be most effective to merge green with gray infrastructure. However, benefits of green infrastructure extend beyond the initial purpose of stormwater management and include items such as environmental quality, community livability, regulatory management and ecosystem services (Garrison and Hobbs, 2011).

Green infrastructure includes reintroducing native plants, which are at the core of the natural food web, and benefits insects that other species need to thrive (Louisiana Native Plant Society, 2020). Populations of birds and butterflies have declined due to loss of habitat and conservation on public property is more important than ever. Native plants provide food and shelter for native animals, birds and insects that evolved within the same ecosystem.

Stormwater management, and other green infrastructure projects, should be an all-inclusive process that involves as many participants as possible to create a resilient system (Lovell and Taylor, 2013). Additional benefits include better air and water quality, improved health, and habitat for native plants and animals (EPA, 2016). Students often experience heightened levels of stress and isolation. Research has proven that gardening can increase physical activity, alleviate anxiety, reduce depression, and improve stress management (Gillihan, 2019).

Volunteer groups, local education programs, internships and other outreach activities can increase community involvement and improve our local neighborhoods. Frantzeskaki (2019) provided valuable lessons on the importance of organizing and building upon current services to ensure fruitful nature-based solutions; his lessons regarding effective communication can be used to work with internal or external partners for sustainable campuses.

Conventional gray infrastructure consists of piped drainage and water treatment systems and is designed to move urban stormwater away from the built environment. In contrast, green infrastructure reduces and treats this stormwater at its source while concurrently providing environmental, social and economic benefits.

Urban stormwater runoff is a major cause of water pollution. The urban, or built, environment of roofs, streets, and parking lots prevents the natural absorption of water into the soil and prevents stabilization of the water table. Most urban centers have used traditional engineering methods such as gutters, storm sewers, and other water collection systems to discharge stormwater into local waterways. Unfortunately, this runoff is contaminated with garbage, heavy metals, bacteria, and other items when it drains into those local waterways. This method of controlling stormwater causes erosion, flooding in local waterways, and habitat destruction and requires expensive maintenance of the built infrastructure.

Contrast urban stormwater to rainfall in natural areas that are undeveloped. In natural areas, water is absorbed and filtered by the soil and vegetation and any runoff is cleaner and less of an environmental issue. Local planners can implement and enforce policies that prohibit destruction of wetland areas that prevent land loss and buffer communities from hurricanes. Green infrastructure mimics some of nature's processes by utilizing vegetation, soil and other practices to manage water and in turn creates a healthier urban environment. Counties or cities can implement a patchwork of natural areas that provide habitat for wildlife, flood protection, cleaner air, and cleaner water. Neighborhoods can also utilize stormwater management systems that mimic nature to reduce runoff. Urban university campuses should showcase these green infrastructure practices on their campus and work with the local community to implement them in the surrounding area.

Green infrastructure projects range from small-scale elements easily implemented by individuals to larger scale projects covering whole watersheds (Tyler,

2016). Listed below are examples of green infrastructure elements that cities and urban universities could implement for stormwater management, not only to benefit campus, but as demonstration projects for their communities.

Bioswales, Planter Boxes and Rain Gardens

Bioswales are a type of rain garden that can be vegetated, mulched or xeriscape channels. Swales slow, infiltrate, and filter stormwater runoff while moving water from one place to another. They are ideally suited in long narrow spaces between sidewalks and streets and enhance biodiversity.

Planter boxes are ideal for space-limited sites in dense urban areas and can be integrated into beautification projects. Planter boxes are rain gardens with walls and can have an open or closed bottom. Boxes filter stormwater and reduce runoff. Rain gardens can range in size and be installed in almost any unpaved space because they are merely shallow, vegetated basins that collect and absorb stormwater. They mimic natural hydrology by infiltrating, evaporating and transpiring water while providing a space for native plants and habitat for wildlife (EPA, 2022).

Buffer Zones

According to Boyd, buffer zones not only protect areas adjacent to water resources, they also provide functional capacities. Some of those functions include the reduction of pollutants or excess nutrients, beautification value, recreation areas and habitat for wetland dependent species (2001). These buffer zones protect wetlands and other bodies of water from adverse actions taking place in adjacent areas that can have

negative impacts to the biological, chemical and physical properties of these aquatic resources.

Green Parking

Parking lot designs can integrate multiple green infrastructure elements and can mitigate the urban heat island while creating habitat. Rain gardens and bioswales can be installed in medians and along the parking perimeter while permeable pavements and planter boxes can be installed in the parking lot (EPA, 2022).

Green Roofs and Downspout Disconnection

Green roofing systems may have a higher upfront cost, but according to the Technical Preservation Services agency at the National Park Service, a green roof could save over $200,000 over an estimated lifespan of forty years. Most of that savings comes from reduced energy costs (National Park Service, 2018). These roofs reduce runoff, regulate building temperature, reduce urban heat islands and provide wildlife habitat.

When downspouts are disconnected, water from the roof is not funneled into the sewer system, but is either stored for future use or allowed to infiltrate the soil. Several practices can be used in downspout disconnection and can include rain barrels, cisterns or permeable areas (EPA, 2022).

Green Streets, Green Alleys and Permeable Pavements

These projects integrate multiple green infrastructure elements to store, infiltrate, and evaporate stormwater. For instance, when a street is repaved with permeable

pavement, bioswales, planter boxes and trees are incorporated into the design (EPA, 2022). Permeable pavements can consist of pervious concrete, porous asphalt or permeable interlocking pavers that infiltrate, treat, or store rainwater where it falls. This can be cost effective where land values are high, but flooding is an issue (EPA, 2022).

Hubs, Corridors and Land Conservation

Hubs are large intact blocks of forest and wetlands. Linear features such as forested stream valleys, ridgelines or other natural areas are corridors. The state of Maryland's green infrastructure program consists of large contiguous blocks of forest and wetlands that are connected by habitat corridors (EPA, 2022). Protecting open space and sensitive natural areas adjacent to or within an urban area improves water quality, improves air quality and provides vital habitat for native flora and fauna. These natural areas also provide recreational opportunities for college students or those living near the campus.

Rainwater Harvesting

Water harvesting systems slow and reduce runoff while storing rainfall for later use (EPA, 2022). This method would be of particular use in arid regions, but can be utilized anywhere and provides water for landscaping or other uses.

Urban Tree Canopy

City trees, or urban tree canopies, reduce heat islands, absorb stormwater and improve air quality. Some cities have installed stormwater tree trenches, which is a system of tree plantings connected via an underground water infiltration structure (EPA, 2022).

As small-scale cities, university campuses provide faculty and students with a living laboratory. Environmentally sustainable campuses should lead by example and include sustainability in curriculum, research and operations when feasible. Green infrastructure and stormwater management are two important areas of urban sustainability that universities could showcase to community partners and incorporate in the classroom.

Just as the Morrill Act resulted in universities having extension offices, the modern university campus could use their own campus best practices to train community members in the areas of environmental sustainability and green infrastructure. University operations, curriculum and research should all include sustainability focuses.

Sustainability in University Operations, Curriculum and Research

There is no one-size-fits all for becoming a sustainable university because each university is unique. The research, teaching, location and available resources will need to be assessed as the first step toward becoming a sustainable university. Several sustainability assessments are available, and universities should select an assessment tool and complete it on a regular basis. A continual improvement process should be established for sustainability, in a manner similar to tracking student success.

In a sustainable university, leadership displays their commitment to sustainability efforts by embedding them into the fabric of the university. Sustainability should be included in the mission statement, vision statement, and be included in institutional effectiveness processes to ensure metrics are maintained. Leadership should

demonstrate commitment by including sustainability in the budget. A sustainable university should implement standards outlined by the Green Building Council for LEED green buildings and SITES for sustainable landscapes. Curriculum, Research and Operations at a sustainable university should work together to provide students with a living laboratory in the form of their campus.

The projects developed by students and employees should also be part of the community engagement with the community. Businesses may be able to visit campus and see green parking lots in action. Neighbors can visit campus to see bioswales or other small-scale green infrastructure projects they can implement at home. In essence, a sustainable campus is one that leverages its strengths to become an approachable example for the internal and external community on environmental sustainability issues.

Universities house environmental sustainability focused research centers and house professors who teach students about sustainability related issues. Unfortunately, there is often a disconnect between what students are taught and the university's operating and maintenance practices. For example, a university may have a transportation center with expertise in bicycle transportation but their campus lacks bike lanes and bike racks. There is a lack of role models for students to learn sustainability behaviors from, at the individual and the institutional level (Higgs & McMillion, 2006).

Leveraging the campus operations and using the campus as a living laboratory for teaching and research would provide valuable experiential learning opportunities for students. McLeod suggests that educational materials should be designed to require students to go through the experiential learning cycle (2024). Effective learning consisted of four stages: an experience, observation and reflection of the experience,

analysis and conclusions of the experience, and new hypothesis resulting in new experiences (McLeod, 2024). Experiential learning was developed by Kolb in 1984 and is a “paradigm for resolving the contradiction between how information is gathered and how it is used” (Kong, 2021, p.2). Experiential learning encourages flexibility, incorporates numerous ways to acquire knowledge into a cycle of learning and provides students with the ability to use what they learn in real world issues (Kolb and Kolb, 2017). University campus operations should be leveraged for curriculum and research related to environmental sustainability.

Motivations for Green Campuses

“Because the campus landscape embodies and articulates this ongoing innovation, it can become a key instrument to advance university sustainability and a legacy for future generations to build upon” (Zhang et al, 2016, p 41.). The literature does not contain much on using campus landscapes to promote sustainability on campuses. Zhang et al., make the point that the physical campus is the embodiment of university values that also serves as an enduring legacy. Campus landscapes provide campus leaders the opportunity to integrate sustainability into the fabric of universities (2016, p. 41). Humans have long had the capacity to harm the environment on a regional scale, but we “now have the power to change our global environment irreversibly, with profoundly damaging effects on the robustness and integrity of the planet and the heritage that we pass to future generations” (Weiss, 1990, p. 198).

External forces may be the initial impetus for higher education to implement environmental sustainability efforts. Larrán et al found a lag in the incorporation of

sustainable practices in university master plans and that when they are included it is often a “response of the pressure exerted by institutional forces, such as the funding systems of higher education” (2016, p. 967). Stafford found “size and wealth are significant factors in the adoption of sustainable practices and that stakeholders such as faculty, alumni, and the surrounding community also play an important role” (2011, p. 337).

While Stafford did not find sustainability efforts to be a deciding factor on school choice for most students, she did find that sustainability efforts are something that students may gain interest in during their studies. As Kecskes points out, service learning and community engagement by faculty and students to address sustainability issues on campus and in the local community are an effective way to engage students beyond the classroom (2017). “Students are often frustrated between the classroom lessons they learn about sustainability and the slow adoption of sustainable practices in the real-world, including on campus” (Ryan, 2018, p. 147). Faculty at University of Massachusetts-Amherst engage students in green infrastructure planning for the campus. Schools with stronger sustainability profiles are shown to be more actively engaged against food waste (Derqui et al, 2020).

American universities have been incorporating sustainability efforts into their campus operations, but much of the focus has been on environmental sustainability measures to save money (Calder and Dautrement-Smith, 2009). The authors point out that these savings are not usually dedicated to sustainability measures with less return on investment and more research is needed to determine what happens when these cost savings goals are accomplished.

Sustainability Rankings for Higher Education

In 2011 Stafford did not find sustainability to be a deciding factor for most students. However, in the last decade as universities are competing to recruit and retain students having a green campus may be a growing competitive advantage. This is reflected in published sustainability rankings in multiple magazines that may influence student school selection for some students. *Sierra* magazine has a Cool Schools ranking. The Princeton Review now publishes a Guide to Green Colleges. BestColleges.com also ranks the Greenest Universities.

Sustainability Shift (Genuine v Greenwashing)

The shift to sustainability for some businesses may be market driven, but consumer research indicates that businesses need to make a permanent shift to survive. “Products with environmental consideration are no longer simply the choice of a few eco-conscious customers, but have now shifted into the mainstream market” (Kanachanapibul et al, 2014). Businesses have pivoted to meet this growing demand in the market, but some advertising is greenwashing rather than a true environmental commitment. Delmas and Burbano describe greenwashing as “the act of misleading consumers regarding the environmental practices of a company (firm-level greenwashing) or the environmental benefits of a product or service (product-level greenwashing)” (2011).

The Federal Trade Commission (FTC) has produced guidelines regarding environmental claims in various industries. “Although the FTC’s oversight of

environmental claims in marketing has strengthened over time, gaps remain, which are detrimental to manufacturers and consumers alike" (Rotman et al, 2020). In 1992 the FTC issued "Guides for the Use of Environmental Marketing Claims, frequently referred to as the Green Guides" (Rotman et al, 2020). These are not laws, but guidelines for businesses to use when making environmental claims regarding their goods or services. "The FTC should formalize the Green Guides as binding regulations, rather than their current form as nonbinding interpretive guidance, as the USDA has done for the National Organic Program (NOP) regulations" (Rotman et al, 2020). Standardizing definitions for terms such as organic, biodegradable, or other environmentally focused language would allow consumers to make better informed purchasing decisions.

Younger generations are more accepting of innovative ideas, and they are more conscious socially, environmentally and culturally; younger generations are also more skeptical in nature than prior generations so they are more likely to demand a rationale to decisions made by others (Kanachanapibul et al, 2014). Younger generations may be more environmentally conscious because of their use of technology. Social networks of younger generations have a large online component. Younger generations social groups are more likely to "dominate their perception, and this reinforces their personal affective response and refines their ecological knowledge" (Kanachanapibul et al, 2014). Universities are businesses that should pay attention to this growing interest in sustainability in younger generations.

Cheeseman et al reviewed the literature in journals dating from 2000 to 2016 that focused on sustainability policy in higher education (2019). Their literature review found a lack of research on how universities can move from policies on sustainability to

implementing the practice on campus. They found that advances have been made on sustainability in higher education, but additional efforts are needed to continue embedding sustainability into higher education. Further efforts are needed for sustainable educational policies to be holistically incorporated throughout operations, governance, research, curriculum, and community engagement in all levels of institutions of higher education (Cheeseman et al, 2019).

Some universities have signed sustainability agreements or declarations to demonstrate their commitment to becoming a sustainable university.

Evolution of Sustainability Agreements and Declarations

Since the 1990's there has been a proliferation of agreements and declarations to guide universities in understanding their roles in creating an ecologically sound future whereby they lead by example.

Talloires Declaration

This declaration is the first official statement made by university presidents to commit to incorporating environmental sustainability within institutions of higher education (ULSF, 2015). The Association of University Leaders for a Sustainable Future serves as the Secretariat for the declaration. To be sustainable, they state that institutions of higher education critical activities are not just ecologically sound, but socially just and economically viable. A truly sustainable institution of higher education would incorporate these concepts into their curriculum, research, operations and community outreach.

The Talloires Declaration was developed in 1990 at an international conference organized by the president of Tufts University in Talloires, France. It started as a ten-point action plan to incorporate sustainability and environmental literacy across teaching, research, operations and outreach in universities and colleges (ULSF, 2015). Over 520 university leaders in over fifty countries have signed the agreement as of July 2023. Thus far, 173 American institutions of higher education have signed the declaration.

Halifax Declaration

In 1991, representatives from thirty-three universities and ten countries met in Halifax, Canada to deliberate the role of universities regarding the environment. Their declaration states that universities must lead by example when creating a sustainable future. Institutions of higher education are entrusted with the responsibility to assist societies shape their present and future sustainable development policies and actions (Wright, 2003).

COPERNICUS University Charter for Sustainable Development

The Copernicus Charter signing in 1993 was a breakthrough that raised consciousness within European universities regarding the need to work together to conserve for the future (COPERNICUS Campus, 2010). In 2011 it was updated to become the COPERNICUS Alliance. Today, the alliance is endorsed by 328 European universities. It represents a commitment for universities to rethink their positions on sustainable development and finding innovative approaches for sustainability (Alliance COPERNICUS, 2023).

Timeline for additional agreements and declarations

- Agenda 21 - 1992
- Swansea Declaration - 1993
- Kyoto Declaration - 1993
- Global Higher Education for Sustainability Partnership - 2000
- Luneburg Declaration - 2001
- Declaration of Barcelona - 2004
- Graz Declaration on Committing Universities to Sustainable Development - 2005
- UN Decade of Education for Sustainable Development - 2005
- The American College & University President's Climate Commitment - 2006
- Turin Declaration - 2009
- RIO +20 – 2012
- The Scottish Universities and Colleges Climate Change Commitment for Scotland – 2016

Signing a sustainability agreement, or declaration, is a demonstration of commitment by the university leadership. Sustainability assessment tools can help institutions of higher education with their metrics and targets.

Sustainability Assessment Tools

"The first step for a school interested in modeling sustainability is to become aware of what the school is currently modeling to students" (Lyons Higgs and McMillan, 2006, p. 51). The literature suggests that institutions of higher education that participate

in assessments of their sustainability efforts are more likely to make progress toward their goals. Spheres of influence on campus can support or undermine efforts. This can be done by modeling either sustainable or unsustainable behaviors in campus operations. The literature shows that since the late 1990s there has been a growth in the number of sustainability assessment tools available for higher education (Larran, et al., 2016). Several of those assessment tools are discussed here.

National Wildlife Federation: State of the Campus Environment Survey

In 2000, the National Wildlife Federation created the first large-scale environmental performance survey. Every "college and university in the United States was asked to describe its environmental practices, from recycling, landscaping and transportation, to campus policies, curriculum, and energy use" (McIntosh et al., 2001, p. 1). Our nation's colleges and universities enroll tens of millions of students annually and employ millions of faculty and staff. As the authors state institutions of higher education are microcosms of society with infrastructure such as roads, buildings, labs, offices and residential living space (McIntosh et al., 2001).

Almost twenty-two percent of schools responded to the survey, with responses from 891 of the 4,100 accredited two-year and four-year colleges and universities in the United States. Modules were developed for management, curriculum and operational sustainability issues and were submitted by 471 presidents, 320 provosts and 325 facilities chiefs. These responses were used to generate a report card of campus environmental performance at American institutions of higher education (McIntosh, et al. 2001).

In the survey, schools were asked to provide information on environmental efforts related to these broad topics: setting and reviewing goals; staffing environmental programs; orientation for students and employees; independent research or service learning opportunities available to students; integration into coursework; professional development opportunities for faculty on environmental topics; water conservation or efficiency upgrades; energy efficiency or conservation upgrades; activity level and array of materials recycled; landscaping overall; average diversion rates; and transportation demand management in general. Each of these broad areas contained subtopics that each had a grade that was averaged for the broad topics. For instance, landscaping subtopics included integrated pest management, programs for native landscaping, programs to provide shelter and food to protect wildlife, restoration of habitat, and removal of invasive exotic species (McIntosh, et al 2001).

While their survey was not intended to rank individual university campuses, it does an excellent job identifying trends in different topic areas by region. Four-year schools had higher scores than two-year schools; schools in the East had the highest scores and schools in the South had the lowest overall scores. The survey used a mixed method approach by utilizing qualitative and quantitative measures. It also allows schools to identify barriers or motivations for implementing environmental change from a management perspective.

Some major strengths of this survey were that it was for two-year and four-year colleges and universities, identified barriers and motivators, included current practices and efforts to build the future pipeline. Some major weaknesses of this survey were the

small sample size at each institution, and not repeating the survey on a schedule that allows schools to track and report improvements.

Several surveys and assessments tools were used by the National Wildlife Federation after this model, but none of them as groundbreaking. While the authors originally intended to conduct the survey every few years to assess trends over time, a series of other assessment reports were published instead. There were also numerous other entities that began survey research into environmental sustainability in higher education. Some of those organizations are discussed next and include the Association of University Leaders for a Sustainable Future, and the Association for the Advancement of Sustainability in Higher Education.

University Leaders for a Sustainable Future: Sustainability Assessment Questionnaire for Colleges and Universities

The Association of University Leaders for a Sustainable Future (ULSF) developed the Sustainability Assessment Questionnaire (SAQ). While the National Wildlife Federation survey had a scoring system, this qualitative questionnaire was developed not only as an assessment tool, but was designed to educate users on how to implement sustainability within colleges and universities (ULSF, 2015). The SAQ has three stated goals. ULSF wants to raise awareness about what sustainability means for institutions of higher education, provide a snapshot of sustainability efforts on campuses, and encourage discussion regarding next steps for improvement (2015).

ULSF found that institutions of higher education must implement meaningful practices in seven core areas to achieve significant progress toward achieving

sustainable campuses (2015). Those seven critical areas of sustainability include: curriculum, research, operations, employee development, outreach, student opportunities, institutional mission statement, and planning (ULSF, 2015). In addition to these critical areas, they would expect institutions to have paid positions for sustainability and host public events on campus regarding sustainability.

The survey can be guided by a member of ULSF, or school staff, with ten to fifteen representatives including constituencies across campus. Representatives should include students, faculty, staff and administrators (ULSF, 2015). Sample definitions regarding sustainability are provided to begin the survey. The survey instrument itself combines a Likert scale and open-ended questions including suggestions for where the institution should head in the future.

Strengths of the SAQ include the fact that it highlights the need for some level of investment in positions and committees to keep the sustainability efforts moving forward, it encourages a larger pool of participation and stresses the importance of groups across campus working as an interdisciplinary team. Weaknesses of the SAQ include the lack of scores for comparison and the ability to benchmark against peers. SAQ promotes discussion for university internal groups, but does not provide a published quantitative report that can be used for rankings. The authors chose to develop a process that was qualitative and impressionistic (ULSF, 2015).The group also dilutes the environmental assessment by bringing in social issues and including questions that would take many staff hours to gather the required data. It may be trying to accomplish too many things with one document.

The Association for the Advancement of Sustainability in Higher Education: The Sustainability Tracking, Assessment and Rating System

The Association for the Advancement of Sustainability in Higher Education (AASHE) released a pilot project for the Sustainability Tracking, Assessment and Rating System (STARS) in 2008. In 2010 the STARS program was release to institutions in the United States and launched an international pilot the following year. American institutions are required to report their Carnegie Classification unless they are special focus or tribal institutions.

STARS participants are ranked at the highest level of Platinum, to Gold, Silver and Bronze. Scores are based on credits related to academics, engagement, operations and planning/administration. Ratings are valid for three years, but reports may be updated annually for those schools that prefer to report more frequently. For universities that do not pay for the full access required to earn a ranking, there is a basic access option with no fees. Participants can still track their progress and create benchmarks. Instead of a score those institutions with basic access will be listed as a “Reporter” on the website (AASHE, 2021).

There are seventeen impact areas that can be reported in the STARS assessment. These impact areas are: “Curriculum, Research, Campus Engagement, Public Engagement, Air & Climate, Buildings, Energy, Food & Dining, Grounds, Purchasing, Transportation, Waste, Water, Coordination & Planning, Diversity & Affordability, Investment & Finance, Wellbeing & Work” (AASHE, 2021). This survey also provides a public website where institutions can compare their efforts to peers.

Reporting requirements for the STARS program include institutional characteristics, institutional boundary, operational characteristics, academic programming and demographics.

The main strength of the STARS program is its longevity and that the rankings may be showcased in some sustainability rankings that will add to the school's recognition. This survey covers many areas of a university so those institutions with the resources may want to participate in a program that can be so encompassing. The scoring system and ability to benchmark against peers are also strengths. Full participation in STARS takes more resources to complete the initial application and maintaining a current status than many of the other available assessments, and includes a fee to participate. In March 2024, the STARS website listed 355 institutions with a current rating.

Sustainable Sites Initiative (SITES)

The American Society of Landscape Architects (ASLA), The Lady Bird Johnson Wildflower Center at the University of Texas at Austin and the U.S. Botanic Garden collaborated to develop the Sustainable Sites Initiative. SITES is a rating system that assesses landscapes for sustainable design, construction, and maintenance (ASLA, 2021). Ownership of the SITES Rating System was transferred to Green Business Certification Inc. They also manage the U.S. Green Building Councils certifications for LEED green buildings.

The LEED rating system applied to buildings and the land they are located on, and the SITES rating system is for everything other than the building. These two rating

systems are complementary and can be used on their own or in collaboration. Project types can include university campuses, open spaces, streetscapes, residential neighborhoods and more (ASLA, 2021). This potential for collaboration is a major strength and the scorecard is in relatable terms that would allow for a broad spectrum of stakeholders to participate.

SITES Certification Levels are certified silver, gold and platinum so participants can assess where they stand. The score card and rating system are available for free online. If participants choose to become certified then there is a charge, and they are profiled on the SITES webpage. The goals of SITES include fostering resiliency, ensuring future resource availability, and transforming landscapes with sustainable design and maintenance practices (SITES, 2021).

Other Sustainability Assessments

The College Sustainability Report Card was suspended in 2012 but showed a dramatic increase in green indicators from the first report card in 2007 (Sustainable Endowment Institute, 2012). Sulitest is a sustainability literacy test that higher education can use to assess and improve the knowledge of their students and employees. There are numerous assessments available for schools to pick from. Schools that are more comfortable with quality management practices can use tools such as the Deming Cycle of plan, do, study and act. The Deming Cycle can be used to walk educational administrators through decisions that result in more environmentally sustainable practices at their campus without compromising other goals (Rusinko, 2005).

Assessment Themes

An underlying theme from the various assessments is that the university leadership should institutionalize environmental sustainability and communicate that to internal and external partners. Sustainability assessments should be completed on a regular basis no differently than other university wide surveys that measure institutional effectiveness. The institutional mission, goals and a paid position dedicated to sustainability set the tone and inform campus that sustainability is valued. Curriculum focused on environmental sustainability degrees, certifications and experiential learning opportunities engage students. Rewarding research and scholarship centered around sustainability encourages faculty involvement. Operations and management should involve staff and others in recycling, green purchasing and other sustainability initiatives. Universities can use these general themes and adapt them to their resources and location to become more environmentally sustainable.

Chapter Three: Methods

The purpose of this study was to research universities of the Gulf South to determine what environmental sustainability practices they had in place and examine if there are trends related to university characteristics. The research questions included:

1. What sustainability practices do universities in the Gulf South have in place on their campus?
    a. In the Gulf South, how many four-year universities have implemented policies promoting environmental sustainability or signed declarations in support of sustainability in higher education?
    b. What percentage of four-year universities offer degrees, minors, or certificates related to environmental sustainability in the Gulf South?
    c. How do faculty at the university participate in research related to environmental sustainability?
    d. What kind of programs do campus operations have in place to promote environmental sustainability?
2. Are certain types of universities more likely to incorporate environmental sustainability practices on their campus?
    a. Does the land-grant status of a university have a correlation to environmental sustainability efforts?
    b. Are urban or rural campuses more likely to implement environmental sustainability initiatives?
    c. Do universities with a higher level of research productivity have a higher level of environmental sustainability?

d. Does the annual enrollment size have a correlation to environmental sustainability efforts?
e. Is there a correlation to environmental sustainability efforts and the highest degree offered at four-year universities?

Design of the Study

A survey design was utilized due to the economy of design and the relative ease of data collection. This survey was cross-sectional and therefore collected data at one time. Data collection was accomplished via an internet survey. This form of data collection was relatively inexpensive, allowed the survey to be widely distributed, enabled ease in sending reminders to those who had not completed the survey and was convenient for responders. As an embedded researcher with knowledge of surveys no formal pilot testing was conducted. Several rounds of the survey instrument were reviewed by committee members. Additionally, colleagues reviewed and tested the survey instrument to ensure the survey could be completed in a reasonable amount of time and that the language was clear. Survey questions were based on the research questions and factors identified in the Whole Institution Approach of sustainability in institutions of higher education.

The Whole Institution Approach incorporates sustainability into the foundation of the institution across all operations (Gleason, 2021). This approach was chosen because it is a holistic model for management to incorporate sustainability through the culture of the school. A Whole Institution Approach has been recognized as a driver of successful governance of sustainability at institutions of higher education (Bauer et al., 2021, Ferrer-Balas et al., 2008; Hoover and Harder, 2015; Singer-Brodowski et al.,

2019). Factors include school facilities, teaching, research, operations, governance, community engagement and a holistic approach to embedding sustainability into all aspects of the institution. A key role can be played by voluntary engagement, but leadership must be committed to sustainability in the whole institution approach (Roos and Guenther, 2020). This research focused on academics, leadership and research efforts toward a Whole Institution Approach for sustainability.

Creswell and Creswell suggest using an exploratory research approach when variables are unknown (2018). The variables that influence sustainability in higher education are not fully understood. Sustainable development is one of the oldest theories, and it is still considered to be in the development stage (Shi et al, 2019). This is in part due to the lack of standardized terminology and reporting metrics. This research is also exploratory because it is focused on the Gulf South. Three of the five states in the region have been classified by the federal government as Established Program to Stimulate Competitive Research (EPSCoR) states. This federal designation is for states that have historically received less federal funding.

Sample Selection

Schools were identified through the Higher Education Research and Development (HERD) Survey. “The HERD Survey is the primary source of information on research and development expenditures at U.S. colleges and universities that expended at least $150,000 in separately accounted for R&D in the fiscal year” (NSF, 2023). Using HERD provided a reliable measure because the survey has consistent reporting guidelines with clearly defined reporting measures. In 2010 HERD replaced the Survey of R&D Expenditures at Universities and Colleges; reports can pull from both

surveys dating back to 1972. This added validity to my research because the HERD survey measures research funding by federal and other sponsors. The National Center for Science and Engineering Statistics website “build a table” feature was used with these parameters:

Table 2. National Center for Science and Engineering Statistics Parameters

Data Download from NCSES Interactive Data Tool	
Filters	**Selected values**
Federal and Nonfederal	ALL
State	Texas, Louisiana, Mississippi, Alabama, Florida
Public or Private	Public institution, Private institution
Highest Degree Awarded	Doctorate, Master's, Bachelor's
Fiscal Year	ALL
Institution Name	ALL
Table	
Deflator: Current Dollars	
Unit of Measure: Dollars	
SOURCE: National Center for Science and Engineering Statistics, Higher Education Research and Development Survey.	

An Excel file was created for the institutions of higher education in the Gulf South. The website of each of those schools listed in the HERD survey 2021 was reviewed, and the names and emails of selected administrators were added to the Excel file. Those selected administrators were the president/chancellor, chief financial officer, provost and sustainability contact if one was posted on the website.

Table 3. Institution Names

Institution Names
Abilene Christian University
Alabama A & M University

Alabama College of Osteopathic Medicine
Alabama State University
Alcorn State University
Angelo State University
Auburn University
Auburn University at Montgomery
Austin College
Barry University
Baylor College of Medicine
Baylor University
Bethune-Cookman University
Delta State University
Dillard University
Eckerd College
Embry-Riddle Aeronautical University-Daytona Beach
Florida Agricultural and Mechanical University
Florida Atlantic University
Florida Gulf Coast University
Florida Institute of Technology
Florida International University
Florida Polytechnic University
Florida State University
Grambling State University
Jackson State University
Jacksonville State University
Jacksonville University
Keiser University-Ft Lauderdale
Lamar University
LeTourneau University
Louisiana State University and Agricultural & Mechanical College
Louisiana State University Health Sciences Center-New Orleans

Louisiana State University Health Sciences Center-Shreveport
Louisiana State University-Shreveport
Louisiana Tech University
Loyola University New Orleans
McMurry University
McNeese State University
Midwestern State University
Millsaps College
Mississippi State University
Mississippi University for Women
Mississippi Valley State University
New College of Florida
Nicholls State University
North American University
Northwestern State University of Louisiana
Nova Southeastern University
Oakwood University
Parker University
Prairie View A & M University
Rice University
Rollins College
Saint Edward's University
Sam Houston State University
Southeastern Louisiana University
Southern Methodist University
Southern University and A & M College
Southern University at New Orleans
Southwestern University
St. Mary's University
St. Thomas University
Stephen F Austin State University

Stetson University
Sul Ross State University
Tarleton State University
Texas A & M International University
Texas A & M University-College Station
Texas A & M University-Commerce
Texas A & M University-Corpus Christi
Texas A & M University-Kingsville
Texas A&M University-Central Texas
Texas A&M University-San Antonio
Texas A&M University-Texarkana
Texas Chiropractic College Foundation Inc
Texas Christian University
Texas Lutheran University
Texas Southern University
Texas State University
Texas Tech University
Texas Tech University Health Sciences Center
Texas Tech University Health Sciences Center-El Paso
Texas Woman's University
The University of Alabama
The University of Tampa
The University of Texas at Arlington
The University of Texas at Austin
The University of Texas at Dallas
The University of Texas at El Paso
The University of Texas at San Antonio
The University of Texas at Tyler
The University of Texas Health Science Center at Houston
The University of Texas Health Science Center at San Antonio
The University of Texas MD Anderson Cancer Center

The University of Texas Medical Branch at Galveston
The University of Texas Permian Basin
The University of Texas Rio Grande Valley
The University of West Florida
Tougaloo College
Trinity University
Troy University
Tulane University of Louisiana
Tuskegee University
University of Alabama at Birmingham
University of Alabama in Huntsville
University of Central Florida
University of Dallas
University of Florida
University of Houston
University of Houston-Clear Lake
University of Houston-Downtown
University of Houston-Victoria
University of Louisiana at Lafayette
University of Louisiana at Monroe
University of Miami
University of Mississippi
University of North Alabama
University of North Florida
University of North Texas
University of North Texas Health Science Center
University of South Alabama
University of South Florida
University of Southern Mississippi
University of Texas Southwestern Medical Center
University of the Incarnate Word

University of West Alabama
West Texas A & M University
Wiley College
William Carey University
Xavier University of Louisiana

Data Collection

Online data collection resulted in the initial list of universities to include in the survey. The HERD survey provided core information for universities such as the state where each institution was located, institution name, if they were a public or private institution, research and development expenditures by year, etc. However, additional online research was necessary to gather information related to characteristics identified in the literature review as having an impact on sustainability initiatives. Table 4 provides the data source. All school websites were reviewed and all schools reported to HERD and IPEDS. The table also provides the number of universities that had current designations. EPSCOR is the only data source that is by state, all other data sources are by university.

Table 4. Data Source and Count

Data Source	**Current Data or Designation**
EPSCoR/IDeA Foundation Eligible Jurisdictions List	3
Bee Campus USA Current Affiliates List	16
Higher Education Research and Development (HERD) Survey	131
Integrated Postsecondary Education Data (IPEDS) System	131
Presidents' Climate Leadership Commitments: Second Nature Website	17
Survey Instrument	26

Sustainability Tracking, Assessment and Rating System (STARS)	34
Talloires Declaration Signatories List	11
Tree Campus Higher Education Recognized Campuses List	37
University Website	131
Note: Unit of measure is university for all measures except EPSCoR which is a state designation	

Louisiana, Mississippi and Alabama are in the federal Established Program to Stimulate Competitive Research (EPSCoR) category. EPSCoR programs seek to enhance research competitiveness in designated states that have historically received less federal funding. The EPSCoR/IDeA Foundation reports that in 2016 the twenty-seven EPSCoR states only received ten percent of federal research funds while five states received forty percent of federal research dollars (2021). If there is a correlation between research activity and environmental sustainability efforts in higher education, this funding disparity may be one of the variables so EPSCoR classification was added to each institution.

The Integrated Postsecondary Education Data (IPEDS) System information on the National Center for Education Statistics website was used to gather additional information for each institution. IPEDS Access database, 2021-22 survey “Institutional Characteristics” was used.

- **Table IC2021MISSION (Mission Statement)** provided the mission statement or the web address of the mission statement for each school. The missing mission statements were added from each schools’ website.
- **Table HD2021 (Directory information)** provided the directory information for all schools in the 2021 IPEDS space. This table contains seventy-four variables

ranging from latitude and longitude, to address and name of institution. Only variables related to basic information of each school such as name and state, and variables related to education and research were used. This resulted in twenty-two variables from this table being used.

The tables below show the selected variables downloaded from these two tables in the 2021-2022 survey Institutional Characteristics in IPEDS.

Table 5. Integrated Postsecondary Education Data System Variables

Integrated Postsecondary Education Data System (IPEDS) Variables
Carnegie Classification 2021: Basic
Carnegie Classification 2021: Enrollment Profile
Carnegie Classification 2021: Graduate Instructional Program
Carnegie Classification 2021: Size and Setting
Carnegie Classification 2021: Undergraduate Instructional Program
Carnegie Classification 2021: Undergraduate Profile
Control of institution
Degree of urbanization (Urban-centric locale)
Degree-granting status
Graduate offering
Highest degree offered
Highest level of offering
Historically Black College or University
Institution Name
Institutional category
Land Grant Institution
Level of institution
Mission Statement
Sector of institution
Tribal college
Undergraduate offering
UnitID

Table 6. IPEDS Value Sets for Variables

This is the table documentation for the IPEDS Database, 2021-22, it contains the values for the selected variables.

Carnegie Classification 2021: Basic (HD2022)
Associate's Colleges: High Career & Technical-High Nontraditional
Associate's Colleges: High Career & Technical-High Traditional
Associate's Colleges: High Career & Technical-Mixed Traditional/Nontraditional
Associate's Colleges: High Transfer-High Nontraditional
Associate's Colleges: High Transfer-High Traditional
Associate's Colleges: High Transfer-Mixed Traditional/Nontraditional
Associate's Colleges: Mixed Transfer/Career & Technical-High Nontraditional
Associate's Colleges: Mixed Transfer/Career & Technical-High Traditional
Associate's Colleges: Mixed Transfer/Career & Technical-Mixed Traditional/Nontraditional
Baccalaureate Colleges: Arts & Sciences Focus
Baccalaureate Colleges: Diverse Fields
Baccalaureate/Associate's Colleges: Associate's Dominant
Baccalaureate/Associate's Colleges: Mixed Baccalaureate/Associate's
Doctoral Universities: High Research Activity
Doctoral Universities: Very High Research Activity
Doctoral/Professional Universities
Master's Colleges & Universities: Larger Programs
Master's Colleges & Universities: Medium Programs
Master's Colleges & Universities: Small Programs
Not applicable, not in Carnegie universe (not accredited or nondegree-granting)
Special Focus Four-Year: Arts, Music & Design Schools
Special Focus Four-Year: Business & Management Schools
Special Focus Four-Year: Faith-Related Institutions
Special Focus Four-Year: Law Schools
Special Focus Four-Year: Medical Schools & Centers
Special Focus Four-Year: Other Health Professions Schools
Special Focus Four-Year: Other Special Focus Institutions
Special Focus Four-Year: Research Institutions
Special Focus Two-Year: Arts & Design
Special Focus Two-Year: Health Professions
Special Focus Two-Year: Other Fields
Special Focus Two-Year: Technical Professions
Carnegie Classification 2021: Enrollment Profile (HD2022)
Exclusively graduate
Exclusively undergraduate four-year
Exclusively undergraduate two-year
High undergraduate

Majority graduate
Majority undergraduate
Not applicable, not in Carnegie universe (not accredited or nondegree-granting)
Very high undergraduate
Carnegie Classification 2021: Graduate Instructional Program (HD2022)
Not applicable, not in Carnegie universe (not accredited or nondegree-granting)
Not classified (Exclusively Undergraduate)
Postbaccalaureate: Business-dominant, with Arts & Sciences
Postbaccalaureate: Business-dominant, with other professional programs
Postbaccalaureate: Comprehensive programs
Postbaccalaureate: Education-dominant, with Arts & Sciences
Postbaccalaureate: Education-dominant, with other professional programs
Postbaccalaureate: Other-dominant, with Arts & Sciences
Postbaccalaureate: Other-dominant, with other professional programs
Postbaccalaureate: Single program-Business
Postbaccalaureate: Single program-Education
Postbaccalaureate: Single program-Other
Research Doctoral: Comprehensive programs, no medical/veterinary school
Research Doctoral: Comprehensive programs, with medical/veterinary school
Research Doctoral: Humanities/social sciences-dominant
Research Doctoral: Professional-dominant
Research Doctoral: Single program-Education
Research Doctoral: Single program-Other
Research Doctoral: STEM-dominant
Carnegie Classification 2021: Size and Setting (HD2022)
Exclusively graduate/professional
Four-year, large, highly residential
Four-year, large, primarily nonresidential
Four-year, large, primarily residential
Four-year, medium, highly residential
Four-year, medium, primarily nonresidential
Four-year, medium, primarily residential
Four-year, small, highly residential
Four-year, small, primarily nonresidential
Four-year, small, primarily residential
Four-year, very small, highly residential
Four-year, very small, primarily nonresidential
Four-year, very small, primarily residential
Not applicable, not in Carnegie universe (not accredited or nondegree-granting)

Two-year, large
Two-year, medium
Two-year, small
Two-year, very large
Two-year, very small
Carnegie Classification 2021: Undergraduate Instructional Program (HD2022)
Arts & sciences focus, no graduate coexistence
Arts & sciences focus, some graduate coexistence
Arts & sciences plus professions, high graduate coexistence
Arts & sciences plus professions, no graduate coexistence
Arts & sciences plus professions, some graduate coexistence
Associate's Colleges: High Career & Technical
Associate's Colleges: High Transfer
Associate's Colleges: Mixed Transfer/Career & Technical
Baccalaureate/Associates Colleges
Balanced arts & sciences/professions, high graduate coexistence
Balanced arts & sciences/professions, no graduate coexistence
Balanced arts & sciences/professions, some graduate coexistence
Not applicable, not in Carnegie universe (not accredited or nondegree-granting)
Not Classified (Exclusively Graduate Programs)
Professions focus, high graduate coexistence
Professions focus, no graduate coexistence
Professions focus, some graduate coexistence
Professions plus arts & sciences, high graduate coexistence
Professions plus arts & sciences, no graduate coexistence
Professions plus arts & sciences, some graduate coexistence
Special Focus: Two-Year Institution
Carnegie Classification 2021: Undergraduate Profile (HD2022)
Four-year, full-time, inclusive, higher transfer-in
Four-year, full-time, inclusive, lower transfer-in
Four-year, full-time, more selective, higher transfer-in
Four-year, full-time, more selective, lower transfer-in
Four-year, full-time, selective, higher transfer-in
Four-year, full-time, selective, lower transfer-in
Four-year, higher part-time
Four-year, medium full-time , selective, higher transfer-in
Four-year, medium full-time, inclusive, higher transfer-in
Four-year, medium full-time, inclusive, lower transfer-in
Four-year, medium full-time, selective, lower transfer-in

Not applicable, not in Carnegie universe (not accredited or nondegree-granting)
Not classified (Exclusively Graduate)
Two-year, higher full-time
Two-year, higher part-time
Two-year, medium full-time
Two-year, mixed part/full-time
Degree of urbanization (Urban-centric locale) (HD2022)
City: Large
City: Midsize
City: Small
Rural: Distant
Rural: Fringe
Rural: Remote
Suburb: Large
Suburb: Midsize
Suburb: Small
Town: Distant
Town: Fringe
Town: Remote
Historically Black College or University (HD2022)
No
Yes
Institution Name
various
Institution size category (HD2022)
1,000 - 4,999
10,000 - 19,999
20,000 and above
5,000 - 9,999
Not applicable
Not reported
Under 1,000
Institutional category (HD2022)
Degree-granting, associate's and certificates
Degree-granting, graduate with no undergraduate degrees
Degree-granting, not primarily baccalaureate or above
Degree-granting, primarily baccalaureate or above
Nondegree-granting, sub-baccalaureate
Not applicable

Not reported
Land Grant Institution (HD2022)
Land Grant Institution
Not a Land Grant Institution
Level of institution (HD2022)
At least 2 but less than 4 years
Four or more years
Less than 2 years (below associate)
Mission statement (IC2022mission)
Open ended question
Sector of institution (HD2022)
Administrative Unit
Private for-profit, 2-year
Private for-profit, 4-year or above
Private for-profit, less-than 2-year
Private not-for-profit, 2-year
Private not-for-profit, 4-year or above
Private not-for-profit, less-than 2-year
Public, 2-year
Public, 4-year or above
Public, less-than 2-year
State abbreviation (HD2022)
Alabama
Florida
Louisiana
Mississippi
Texas
UNITID
various

A more detailed explanation of IPEDS variables is available in Appendix F.

Survey data collection

A copy of each survey instrument is included in the appendixes. In the first round of survey distribution, surveys were emailed to the president and chief business affairs officer. Appendix B contains the survey for the president or chancellor of each school.

Surveys were sent to the president or chancellor at each of the 131 schools. Six of the surveys were completed, for a response rate of five percent. Appendix C contains the survey for the business affairs, operations or primary administrative officer of each school. Surveys were emailed to each of the administrators at the 131 schools in the sample population. Ten of the surveys were completed, for a response rate of eight percent. These surveys were emailed up to three times and remained open while the second round of surveys were distributed.

In the second round of survey distribution, surveys were emailed to the chief academic officer and the sustainability contact if one was listed on the university website. Appendix D contains the survey for the provost, or chief academic officer at each school. Seven of the surveys were completed, for a response rate of five percent. Appendix E contains the survey for the sustainability contact if one was listed on the campus website. Sixteen schools listed a sustainability contact and ten of them completed the survey, for a response rate of sixty three percent.

The survey questions were related to environmental sustainability activities listed in the literature. In the Whole Institution Approach the breadth of operations must include sustainability, including management, budget and professional development (Gleason, 2021). Sustainability should be integrated into the curriculum, research activities and operations (Bauer, et. al, 2021). These survey questions address how sustainability is addressed in the areas of leadership, research, operations and academics.

- Does your institution have a written commitment to environmental sustainability in your mission statement, vision statement or institutional effectiveness program?
- Does your institution have a written commitment to include environmental sustainability in your academic mission?
- Does your campus offer an orientation session about environmental sustainability initiatives to students, faculty or staff?
- Does your campus have a structured framework and clear expectations for the campus operations to increase environmental sustainability?
- Has your campus signed a sustainability agreement or declaration (i.e. Talloires Declaration, or The American College & University President's Climate Commitment)?
- Has your campus used a sustainability assessment tool to evaluate environmental sustainability efforts (i.e. National Wildlife Federation: State of the Campus Environment Survey, University Leaders for a Sustainable Future: Sustainability Assessment Questionnaire for Colleges and Universities, or The Association for the Advancement of Sustainability in Higher Education: The Sustainability Tracking, Assessment and Rating System (STARS))?
- Does your campus have a full-time paid position to lead environmental sustainability issues?
- If your campus has a full-time paid position to lead environmental sustainability issues, where do they report?

- Does your campus have an environmental sustainability task force, committee, or council?
- Does your institution have a dedicated green fee to fund sustainability efforts?
- Are students at your institution required to take a course on environmental sustainability topics or issues (select all that apply)?
    - Yes – all undergraduate students are required to take a course
    - Yes – some undergraduate students are required to take a course
    - Yes – all graduate students are required to take a course
    - Yes – some graduate students are required to take a course
    - No students are required
- For undergraduate students, do you offer (select all that apply)?
    - A major in environmental studies
    - A minor in environmental studies
    - A certificate in environmental studies
    - Service learning opportunities related to environmental sustainability
    - Student projects on campus related to environmental sustainability
    - None of the above
- For graduate students, do you offer (select all that apply)?
    - A major in environmental studies
    - A minor in environmental studies
    - A certificate in environmental studies
    - Service learning opportunities related to environmental sustainability
    - Student projects on campus related to environmental sustainability

    - None of the above
- Do sustainability efforts at your campus enhance your community engagement and outreach?
- Are you aware of research funding related to environmental sustainability on your campus?
- Does your institution have research centers or institutes focused on environmental sustainability?
- Does your institution have large interdisciplinary grants related to environmental sustainability?
- Does your campus include green infrastructure in campus operations (select all that apply)?
    - Native Plants are required in landscaping projects
    - The campus is taking steps to remove non-native plants
    - The campus has a tree maintenance plan
    - Bioswales, planter boxes or rain gardens
    - Buffer zones to protect wetlands, or other bodies of water near campus
    - Green parking
    - Green roofs and/or downspout disconnection
    - Green street, green alleys or permeable pavements
    - Rainwater harvesting
    - No green infrastructure projects are in place at this time
- Does your campus include sustainability options in any of the operating services listed below (select all that apply)?

- Recycling
  - Paper
  - Corrugated cardboard
  - Aluminum
  - Glass
  - Plastic
  - Electronics
  - No recycling is offered at this time
- Composting (select all that apply)
  - Food scraps are composted
  - Landscape trimmings are composted
  - No composting is offered at this time

- Green purchasing requirements (select all that apply):
  - Paper is minimum 25% standard post-consumer waste
  - Office paper is chlorine-free
  - Appliance purchases are energy efficient
  - A materials exchange or recovery program is in place (unused items are offered to other units on campus rather than disposing of)
  - No green purchasing requirements are in place at this time
- Buildings (select all that apply):
  - The campus has one or more LEED certified green buildings
  - There are environmental performance requirements for new buildings

- There are environmental performance requirements for updates of existing buildings
- There is at least one building with a green roof (roof planted with vegetation)
- No green building guides are in place at this time

One-hundred thirty-one institutions of higher education were selected for the sample and emailed surveys. Electronic surveys were created using Qualtrics, a software used to develop and distribute surveys. Initial surveys were emailed to the president and chief financial officer at selected four-year universities in the Gulf South of the Unites States. Each administrator was asked to answer questions related to the portion of the university under their purview. The president was asked about the university culture and strategy and the chief financial officer was questioned about operations and maintenance. Surveys were emailed up to three times to each administrator, in an effort to maximize the response rate.

A low response rate prompted the researcher to email a second round of surveys. One survey of all research questions was emailed to the provost and if a sustainability contact was listed on the university website the survey was also emailed to them. These surveys were emailed up to three times to each administrator, in an effort to maximize the response rate. After the second round of surveys, only twenty-six of the one hundred thirty-one schools responded. This sample size was only twenty percent, so secondary data was used so all institutions in the sample population could be accounted for.

Secondary Data Collection for Sustainability

The Sustainability Tracking, Assessment and Rating System (STARS) by the Association for the Advancement of Sustainability in Higher Education was used as a secondary source of information. Schools can report their sustainability efforts in STARS and fifty-nine of the institutions had a STARS profile. Information regarding sustainability in academics, research, operations and leadership was available for thirty-four of the schools.

The Higher Education Research and Development Survey at the National Center for Science and Engineering Statistics was used as a source of information regarding research activity at each school. The field of study, source of funds and expenditure amounts were reviewed for each school.

Websites for each school were reviewed. The majors, minors and certifications offered at each school were reviewed to determine academic offerings related to sustainability. Each website was reviewed for research funding related to environmental sustainability on campus. Some universities have research offices that list grants; other schools hosted the information on departmental websites. University websites were searched for centers and institutes with a focus on environmental sustainability. Each website was searched for keywords from the survey related to operations such as green infrastructure, recycling, compost, and green building (LEED). General terms such as environmental and sustainability were also researched. Mission statements were reviewed for each school to determine if they included leaderships commitment to sustainability. Seventy-five of the schools hosted a dedicated sustainability website and

each was reviewed for efforts related to academics, research, operations and leadership. See Table 7 below for the list of keywords used in the website review.

Table 7. Website Search Keywords

Website Search - Keywords
AASHE STARS
Association for the Advancement of Sustainability in Higher Education
Bee Campus
Compost
Environmental Sustainability
Grant
Green Building
Green Infrastructure
LEED Certified
President Climate Leadership
Recycle
Recycling
Research
Second Nature
Sponsored Research
Sustainability
Sustainability Tracking, Assessment and Rating System
Sustainable
Talloires Declaration
Tree Campus
University Leaders for a Sustainable Future

A secondary source for sustainability in operations was the Tree Campus Higher Education program by the Arbor Day Foundation. They list recognized campuses who have committed to improving their tree canopy, engaging the students in a service learning project and other standards. Thirty-seven of the schools were active affiliates.

An additional secondary source for sustainability in operations was the Bee Campus USA, a program by the Xerces Society that provides a framework for campuses to conserve native pollinators. The list of affiliates was reviewed, and sixteen schools were active affiliates.

A secondary source to find leadership commitment to sustainability was the Association of University Leaders for a Sustainable Future website. They host the current signature list for the Talloires Declaration. This is a commitment by university leaders to incorporate sustainability in their operations in addition to teaching and research. Eleven schools signed the Talloires Declaration.

An additional secondary source to find leadership commitment to sustainability was the Second Nature website. It hosts the list of schools who signed one of the President's Climate Leadership Commitments. Seventeen schools had leaders who signed a climate commitment.

Quantitative Data Analysis

The online questionnaire facilitated data analysis because there was no data entry, and the analysis could be conducted in Microsoft Excel. Creswell recommends presenting data analysis as "a series of steps so that a reader can see how one step leads to another" (2018). One of the first items to be analyzed was the respondents and

their demographic data, which was provided in a table. Survey data were analyzed for descriptive and inferential statistics. Because the survey was distributed online there was no subjectivity in the data analysis and this contributed to the reliability of the survey. Survey responses were analyzed to look for patterns or trends that contribute to or prohibit environmental sustainability in universities.

Secondary data from all sources were entered into a spreadsheet and analyzed. Schools were categorized as having sustainability in their operations based on their participation in green infrastructure, recycling, green buildings (LEED), Tree Campus designation, Bee Campus Designation, or other operational activities reported on their website. Schools were categorized as having sustainability in their leadership based on commitments in their mission statement, vision statement, signing declarations or other activities reported on their website.

Worldview

As an embedded research administrator in the Office of Research, this study was pragmatic because this project can be used to increase environmental sustainability at the university where I work. As a staff advisor to the Garden Club and Recycling Ambassador program, students communicate the disconnect they experience between the environmentally sustainable best practices learned in the classroom and those displayed on campus. In addition, the office where I work would like to increase grant writing, scholarly publications and student projects related to environmental sustainability. The results of this research can help the university to better utilize the campus as an interdisciplinary learning lab. It is imperative that students and employees are enculturated into an organization that showcases what students are

learning, reduces the historical disconnect between the best practices taught in the classroom and displayed on campus, and is inviting to the surrounding community.

Research Limitations

Sampling size was a limiting factor because only four-year universities and colleges in the Gulf South that complete the NSF HERD survey were reviewed. Other institutions of higher education, such as community colleges, would add to the available literature, but that large a population was beyond my time and budget. Data gathering regarding the status of environmental sustainability was done at one time, not over a period of time, which is another limitation.

This population spanned from Texas to Florida, but the participation rate depended on the willingness of the selected population to participate. While surveys allow respondents to remain anonymous, they also lack personalization. There was the risk that some respondents choose answers prior to reading and understanding the questions. Some respondents may interpret the question differently than it was intended, or respondents may guess at the answers instead of researching current processes in place. There was no ability to follow up on the surveys.

“Researchers have noted that self-report data often reflect a phenomenon known as self-presentation bias or social desirability bias—that is, a tendency of individuals to present themselves and their practices in a favorable way” (Kopcha and Sullivan, 2007, p. 628). The Higher Education Research and Development (HERD) survey for research and development expenditures uses standard language, and has been in place for decades, but is self-reported data. The Association for the Advancement of Sustainability in Higher Education (AASHE) program Sustainability Tracking,

Assessment and Rating System (STARS) is self-reported data. In addition to containing self-reporting data, STARS participation is optional so higher performing schools may be overrepresented. University employees are self-reporting data in the survey instrument for this research, which may introduce self-presentation bias.

Data can be easily collected with self-reporting tools such as surveys. However, Kopcha and Sullivan found that teachers self-reported greater use best practices than did their students (2007). The researchers recommend collecting and analyzing alternative sources of information in addition to the self-reported material (Kopcha and Sullivan, 2007).

The research design was changed due to lack of survey responses at only twenty percent. Cheeseman et al found additional research was needed to implement sustainability practices on their campuses (2019). However, part of the problem with implementing sustainability initiatives is the lack of consistent terminology and standardizations. Additionally, reporting requirements are not mandatory. The National Science Foundation standardized reporting requirements for research expenditures and space used for research. The Integrated Postsecondary Education Data System collects data from schools that participate in federal financial assistance and has also provided robust standardized reporting requirements centered on education. Some researchers have categorized sustainable development as still being in the developing stage (Shi et al., 2019). To improve sustainability efforts in higher education standardization in terms and reporting requirements are needed.

Chapter Four: Results

The first research question focused on what sustainability practices institutions of higher education in the Gulf South had in place on their campuses. The second question was if certain types of universities were more likely to incorporate sustainability practices on their campuses. In this chapter highlighted results are grouped by academics, research, operations and leadership. Each grouping then has results for characteristics related to land-grant status, location, control, highest degree offered, enrollment, research and residency.

Academics related to sustainability

Academic degrees, minors, academic courses, or certificates related to sustainability could be offered at the undergraduate or graduate level. For example, a degree in Environmental Sciences would qualify as sustainability in academics. A minor in Conservation Biology would also qualify as sustainability in academics. Eighty-two percent of institutions of higher education in the sample provided academic offerings related to sustainability. The tables below illustrate in greater detail the academics related to sustainability by institutional characteristics.

Table 8. Sustainability Academics – Land Grant Institution

Land Grant	Sustainability Academics	No Sustainability Academics	Institutions	Percent Academics
No	96	24	120	80%
Yes	11	0	11	100%
Grand Total	**107**	**24**	**131**	**82%**

All Land Grant institutions of higher education in the sample provided degrees, minors or certifications related to sustainability. Eighty percent of non-land grant institutions provided degrees, minors or certifications related to sustainability

Table 9. Sustainability Academics – HBCU

HBCU	Sustainability Academics	No Sustainability Academics	Institutions	Percent Academics
No	94	19	113	83%
Yes	13	5	18	72%
Grand Total	**107**	**24**	**131**	**82%**

A substantial majority of HBCU institutions provided degrees or certifications related to sustainability, but it was 11% lower than non HBCU institutions.

Table 10. Sustainability Academics – Location

Location	Sustainability Academics	No Sustainability Academics	Institutions	Percent Academics
City	74	17	91	81%
Rural	6	1	7	86%
Suburb	9	3	12	75%
Town	18	3	21	86%
Grand Total	**107**	**24**	**131**	**82%**

Institutions of higher education located in towns and rural areas were more likely to provide educational programing centered on sustainability. Eighty-one percent of schools in cities included sustainability in academics. Schools in suburbs were least likely to provide academic programming for sustainability.

Table 11. Sustainability Academics – Locale Detail

Locale Detail	Sustainability Academics	No Sustainability Academics	Institutions	Percent Academics
City: Large	25	12	37	68%
City: Midsize	27	4	31	87%
City: Small	22	1	23	96%
Rural: Fringe	4	1	5	80%
Rural: Remote	2	0	2	100%
Suburb: Large	9	2	11	82%
Suburb: Small	0	1	1	0%
Town: Distant	6	2	8	75%
Town: Fringe	2	1	3	67%
Town: Remote	10	0	10	100%
Grand Total	**107**	**24**	**131**	**82%**

Based on percentage, remote towns and remote rural regions were the most likely to host institutions of higher education that engaged in academics related to sustainability. Based on numbers of institutions, cities hosted 69% of institutions of higher education offering degrees and certifications related to sustainability.

Table 12. Sustainability Academics – Control of Institution

Control	Sustainability Academics	No Sustainability Academics	Institutions	Percent Academics
Public	74	14	88	84%
Private	33	10	43	77%
Grand Total	**107**	**24**	**131**	**82%**

Public institutions of higher education were 7% more likely to include sustainability in their operations than private schools were.

Table 13. Sustainability Academics – Highest Level Degree Offered

Highest Degree Offered	Sustainability Academics	No Sustainability Academics	Institutions	Percent Academics
Bachelor's degree	2	2	4	50%
Doctor's degree	88	17	105	84%
Master's degree	16	5	21	76%
Post-master's certificate	1	0	1	100%
Grand Total	**107**	**24**	**131**	**82%**

Institutions of higher education were more likely to offer degrees and certificates on sustainability as the level of degree offered increased. Schools offering only a bachelor's degree were least likely to offer degrees in sustainability at 50%.

Table 14. Sustainability Academics – Enrollment Size

Enrollment	Sustainability Academics	No Sustainability Academics	Institutions	Percent Academics
Under 1,000	2	7	9	22%
1,000 - 4,999	28	11	39	72%
5,000 - 9,999	28	5	33	85%
10,000 - 19,999	23	1	24	96%
20,000 and above	26	0	26	100%
Grand Total	**107**	**24**	**131**	**82%**

The larger the institution, the more likely they were to offer degrees and certifications related to sustainability. All institutions with more than 20,000 students provided academic programs around sustainability. Institutions with less than 1,000 students were the least likely to provide academic programs around sustainability.

Table 15. Sustainability Academics – Carnegie Classification

Carnegie Classification	Sustainability Academics	No Sustainability Academics	Institutions	Percent Academics
Baccalaureate Colleges: Arts & Sciences Focus	8	2	10	80%
Baccalaureate Colleges: Diverse Fields	3	1	4	75%
Doctoral Universities: High Research Activity	19	1	20	95%
Doctoral Universities: Very High Research Activity	27	0	27	100%
Doctoral/Professional Universities	13	1	14	93%
Master's Colleges & Universities: Larger Programs	29	3	32	91%
Master's Colleges & Universities: Medium Programs	5	3	8	63%
Master's Colleges & Universities: Small Programs	3	0	3	100%
Special Focus Four-Year: Medical Schools & Centers	0	5	5	0%
Special Focus Four-Year: Other Health Professions Schools	0	2	2	0%
Special Focus Four-Year: Research Institutions	0	6	6	0%
Grand Total	**107**	**24**	**131**	**82%**

Doctoral universities were more likely to engage in research around sustainability than other universities. Universities with a Very High Research Activity rating by Carnegie and Small programs at institutions offering Masters were the most likely to provide degrees and certifications related to sustainability.

Table 16. Sustainability Academics – Carnegie Classification 2021: Enrollment Profile

Enrollment Profile	Sustainability Academics	No Sustainability Academics	Institutions	Percent Academics
Exclusively graduate	0	5	5	0%
Exclusively undergraduate four-year	2	2	4	50%
High undergraduate	56	4	60	93%
Majority graduate	4	8	12	33%
Majority undergraduate	18	1	19	95%
Very high undergraduate	27	4	31	87%
Grand Total	**107**	**24**	**131**	**82%**

Institutions of higher education with some graduate programs, but a higher percentage of undergraduate students, were more likely to offer degrees and certifications related to sustainability.

Table 17. Sustainability Academics – Carnegie Classification 2021: Undergraduate Profile

Enrollment Profile	Sustainability Academics	No Sustainability Academics	Institutions	Percent Academics
Four-year, full-time, inclusive, higher transfer-in	16	9	25	64%
Four-year, full-time, inclusive, lower transfer-in	10	3	13	77%
Four-year, full-time, more selective, higher transfer-in	6	0	6	100%
Four-year, full-time, more selective, lower transfer-in	9	0	9	100%
Four-year, full-time, selective, higher transfer-in	10	0	10	100%
Four-year, full-time, selective, lower transfer-in	21	0	21	100%
Four-year, higher part-time	8	0	8	100%
Four-year, medium full-time , selective, higher transfer-in	11	1	12	92%
Four-year, medium full-time, inclusive, higher transfer-in	16	4	20	80%
Four-year, medium full-time, inclusive, lower transfer-in	0	1	1	0%
Four-year, medium full-time, selective, lower transfer-in	0	1	1	0%
Not classified (Exclusively Graduate)	0	5	5	0%
Grand Total	**107**	**24**	**131**	**82%**

The majority of institutions of higher education offered degrees and certifications related to sustainability. Those with a higher rate of full-time students were more likely to provide academic programs related to sustainability than those schools with fewer full-time students. Selective enrollment institutions were more likely to offer programs related to sustainability than were inclusive institutions.

Table 18. Sustainability Academics – Carnegie Classification 2021: Size and Setting

Enrollment Profile	Sustainability Academics	No Sustainability Academics	Institutions	Percent Academics
Exclusively graduate/professional	0	5	5	0%
Four-year, large, highly residential	2	0	2	100%
Four-year, large, primarily nonresidential	21	1	22	95%
Four-year, large, primarily residential	17	0	17	100%
Four-year, medium, highly residential	13	1	14	93%
Four-year, medium, primarily nonresidential	10	3	13	77%
Four-year, medium, primarily residential	22	2	24	92%
Four-year, small, highly residential	14	2	16	88%
Four-year, small, primarily nonresidential	2	1	3	67%
Four-year, small, primarily residential	3	3	6	50%
Four-year, very small, highly residential	3	3	6	50%
Four-year, very small, primarily nonresidential	0	3	3	0%
Grand Total	**107**	**24**	**131**	**82%**

Larger institutions were more likely to offer degrees and certifications related to sustainability. Institutions with a higher level of residential students were more likely to offer degrees or certifications related to sustainability.

Table 19. Sustainability Academics – State

State	Sustainability Academics	No Sustainability Academics	Institutions	Percent Academics
AL	13	2	15	87%
FL	24	1	25	96%
LA	13	5	18	72%
MS	10	1	11	91%
TX	47	15	62	76%
Grand Total	**107**	**24**	**131**	**82%**

The majority of institutions of higher education in the Gulf South offered degrees, minors or certifications related to sustainability. This ranged from 72% in Louisiana to 96% in Florida.

Table 20. Sustainability Academics – EPSCoR

EPSCOR STATE	Sustainability Academics	No Sustainability Academics	Institutions	Percent Academics
No	71	16	87	82%
Yes	36	8	44	82%
Grand Total	**107**	**24**	**131**	**82%**

Institutions of higher education in the Gulf South offered academic programming related to sustainability at the same rate in EPSCoR and non-EPSCoR states.

Table 21. Sustainability Academics – EPSCoR & State

EPSCOR & State	Sustainability Academics	No Sustainability Academics	Institutions	Percent Academics
No	71	16	87	82%
FL	24	1	25	96%
TX	47	15	62	76%
Yes	36	8	44	82%
AL	13	2	15	87%
LA	13	5	18	72%
MS	10	1	11	91%
Grand Total	**107**	**24**	**131**	**82%**

Overall, institutions of higher education in the Gulf South offered academic programming related to sustainability at the same rate in EPSCoR and non-EPSCoR states. However, the state with schools most likely to offer academic programming related to sustainability (Florida) was not an EPSCoR state. The state least likely to offer academic programming related to sustainability was an EPSCoR state (Louisiana).

Research related to sustainability

Research would include sponsored funding related to environmental sustainability, and hosting research centers/institutes focused on environmental sustainability. One example would be a center in a college of engineering focused on alternative energy. Another example would be a planning department with grants related to green infrastructure. Seventy-two percent of institutions of higher education in the sample were engaged in research related to sustainability. The tables below illustrate in greater detail the research related to sustainability by institutional characteristics.

Table 22. Sustainability Research – Land Grant Institution

Land Grant	Sustainability Research	No Sustainability Research	Institutions	Percent Research
No	83	37	120	69%
Yes	11		11	100%
Grand Total	**94**	**37**	**131**	**72%**

All Land Grant institutions of higher education in the sample engaged in research related to sustainability.

Table 23. Sustainability Research – HBCU

HBCU	Sustainability Research	No Sustainability Research	Institutions	Percent Research
No	82	31	113	73%
Yes	12	6	18	67%
Grand Total	**94**	**37**	**131**	**72%**

The majority of HBCU institutions engaged in research related to sustainability, but it was 6% lower than non HBCU institutions.

Table 24. Sustainability Research – Location

Location	Sustainability Research	No Sustainability Research	Institutions	Percent Research
City	66	25	91	73%
Town	16	5	21	76%
Suburb	8	4	12	67%
Rural	4	3	7	57%
Grand Total	**94**	**37**	**131**	**72%**

Institutions of higher education located in cities and towns were more likely to participate in research related to sustainability than were institutions located in suburbs or rural areas. The average for institutions located in cities or towns to engage in

research related to sustainability was 73%, compared to institutions in suburbs or rural areas who averaged 63%.

Table 25. Sustainability Research – Locale Detail

Locale Detail	Sustainability Research	No Sustainability Research	Institutions	Percent Research
City: Large	25	12	37	68%
City: Midsize	23	8	31	74%
City: Small	18	5	23	78%
Rural: Fringe	3	2	5	60%
Rural: Remote	1	1	2	50%
Suburb: Large	8	3	11	73%
Suburb: Small	0	1	1	0%
Town: Distant	6	2	8	75%
Town: Fringe	2	1	3	67%
Town: Remote	8	2	10	80%
Grand Total	**94**	**37**	**131**	**72%**

Based on percentage, remote towns were the most likely to host institutions of higher education that engaged in research related to sustainability. Based on numbers of institutions, cities hosted 70% of institutions of higher education engaged in research related to sustainability.

Table 26. Sustainability Research – Control of Institution

Control	Sustainability Research	No Sustainability Research	Institutions	Percent Research
Public	68	20	88	77%
Private	26	17	43	60%
Grand Total	**94**	**37**	**131**	**72%**

Public institutions of higher education were 17% more likely to be engaged in research related to sustainability than private institutions were.

Table 27. Sustainability Research – Highest Level Degree Offered

Highest Degree Offered	Sustainability Research	No Sustainability Research	Institutions	Percent Research
Doctor's degree	80	25	105	76%
Master's degree	11	10	21	52%
Bachelor's degree	2	2	4	50%
Post-master's certificate	1	0	1	100%
Grand Total	**94**	**37**	**131**	**72%**

As the highest level degree offered increased, so too did the research around sustainability topics. Only 50% of school's offering bachelor's degrees researched sustainability topics, but 76% of school's granting doctor's degrees engaged in research related to sustainability.

Table 28. Sustainability Research – Enrollment Size

Enrollment	Sustainability Research	No Sustainability Research	Institutions	Percent Research
Under 1,000	2	7	9	22%
1,000 - 4,999	21	18	39	54%
5,000 - 9,999	22	11	33	67%
10,000 - 19,999	23	1	24	96%
20,000 and above	26	0	26	100%
Grand Total	**94**	**37**	**131**	**72%**

The larger the institution, the more likely they were to engage in research related to sustainability. All institutions with more than 20,000 students participated in research around sustainability. Institutions with less than 1,000 students were the least likely to engage in research around sustainability.

Table 29. Sustainability Research – Carnegie Classification

Carnegie Classification	Sustainability Research	No Sustainability Research	Institutions	Percent Research
Baccalaureate Colleges: Arts & Sciences Focus	6	4	10	60%
Baccalaureate Colleges: Diverse Fields	2	2	4	50%
Doctoral Universities: High Research Activity	19	1	20	95%
Doctoral Universities: Very High Research Activity	27	0	27	100%
Doctoral/Professional Universities	10	4	14	71%
Master's Colleges & Universities: Larger Programs	24	8	32	75%
Master's Colleges & Universities: Medium Programs	4	4	8	50%
Master's Colleges & Universities: Small Programs	1	2	3	33%
Special Focus Four-Year: Medical Schools & Centers	0	5	5	0%
Special Focus Four-Year: Other Health Professions Schools	0	2	2	0%
Special Focus Four-Year: Research Institutions	1	5	6	17%
Grand Total	**94**	**37**	**131**	**72%**

Doctoral universities were more likely to engage in research around sustainability than other universities. Universities with a research rating by Carnegie were the most likely to engage in research related to sustainability.

Table 30. Sustainability Research – Carnegie Classification 2021: Enrollment Profile

Enrollment Profile	Sustainability Research	No Sustainability Research	Institutions	Percent Research
Exclusively graduate	0	5	5	0%
Exclusively undergraduate four-year	2	2	4	50%
High undergraduate	53	7	60	88%
Majority graduate	2	10	12	17%
Majority undergraduate	15	4	19	79%
Very high undergraduate	22	9	31	71%
Grand Total	**94**	**37**	**131**	**72%**

Institutions of higher education with some graduate programs, but a higher percentage of undergraduate students, were more likely to engage in research related to sustainability.

Table 31. Sustainability Research – Carnegie Classification 2021: Undergraduate Profile

Enrollment Profile	Sustainability Research	No Sustainability Research	Institutions	Percent Research
Four-year, full-time, inclusive, higher transfer-in	11	14	25	44%
Four-year, full-time, inclusive, lower transfer-in	10	3	13	77%
Four-year, full-time, more selective, higher transfer-in	6	0	6	100%
Four-year, full-time, more selective, lower transfer-in	9	0	9	100%
Four-year, full-time, selective, higher transfer-in	9	1	10	90%
Four-year, full-time, selective, lower transfer-in	18	3	21	86%
Four-year, higher part-time	7	1	8	88%
Four-year, medium full-time , selective, higher transfer-in	10	2	12	83%
Four-year, medium full-time, inclusive, higher transfer-in	14	6	20	70%
Four-year, medium full-time, inclusive, lower transfer-in	0	1	1	0%
Four-year, medium full-time, selective, lower transfer-in	0	1	1	0%
Not classified (Exclusively Graduate)	0	5	5	0%
Grand Total	**94**	**37**	**131**	**72%**

Institutions of higher education with a higher rate of full-time students were more likely to participate in research related to sustainability than schools with fewer full-time students. Selective enrollment institutions were more likely to engage in research related to sustainability than were inclusive institutions.

Table 32. Sustainability Research – Carnegie Classification 2021: Size and Setting

Enrollment Profile	Sustainability Research	No Sustainability Research	Institutions	Percent Research
Exclusively graduate/professional	0	5	5	0%
Four-year, large, highly residential	2	0	2	100%
Four-year, large, primarily nonresidential	21	1	22	95%
Four-year, large, primarily residential	17	0	17	100%
Four-year, medium, highly residential	12	2	14	86%
Four-year, medium, primarily nonresidential	9	4	13	69%
Four-year, medium, primarily residential	17	7	24	71%
Four-year, small, highly residential	11	5	16	69%
Four-year, small, primarily nonresidential	1	2	3	33%
Four-year, small, primarily residential	2	4	6	33%
Four-year, very small, highly residential	2	4	6	33%
Four-year, very small, primarily nonresidential	0	3	3	0%
Grand Total	**94**	**37**	**131**	**72%**

Larger institutions were more likely to engage in research related to sustainability. Institutions with a higher level of residential students were more likely to

engage in research related to sustainability. Large schools with a higher percentage of residential students were most likely to engage in research related to sustainability.

Table 33. Sustainability Research – State

State	Sustainability Research	No Sustainability Research	Institutions	Percent Research
AL	10	5	15	67%
FL	23	2	25	92%
LA	13	5	18	72%
MS	7	4	11	64%
TX	41	21	62	66%
Grand Total	94	37	131	72%

The majority of institutions of higher education in the Gulf South host faculty who were active in research related to sustainability. This ranged from 64% in Mississippi to 92% in Florida.

Table 34. Sustainability Research – EPSCoR

EPSCOR STATE	Sustainability Research	No Sustainability Research	Institutions	Percent Research
No	64	23	87	74%
Yes	30	14	44	68%
Grand Total	**94**	**37**	**131**	**72%**

Faculty at institutions of higher education in the Gulf South were 6% more likely to engage in research related to sustainability if they work in non EPSCoR states.

Table 35. Sustainability Research – EPSCoR & State

EPSCOR & State	Sustainability Research	No Sustainability Research	Institutions	Percent Research
No	64	23	87	74%
FL	23	2	25	92%
TX	41	21	62	66%
Yes	30	14	44	68%
AL	10	5	15	67%
LA	13	5	18	72%
MS	7	4	11	64%
Grand Total	**94**	**37**	**131**	**72%**

Institutions of higher education in non EPSCoR states were more likely to engage in research related to sustainability. This range was from 64% in Mississippi to 92% in Florida.

Operations related to sustainability

Operations related to sustainability on campus outdoor spaces may include green infrastructure, native plantings, composting, or integrated pest management programs. Indoor operation activities may include green building codes, energy efficiency programs, recycling, green purchasing, or green lab programs. Some schools produce green energy on campus. Other schools have reduced parking on campus, while promoting biking, ride sharing and other sustainable transportation options. Eighty-one percent of institutions of higher education in the sample included sustainability in campus operations. The tables below illustrate in greater detail the operations related to sustainability by institutional characteristics.

Table 36. Sustainability Operations – Land Grant Institution

Land Grant	Sustainability Operations	No Sustainability Operations	Institutions	Percent Operations
No	98	22	120	82%
Yes	8	3	11	73%
Grand Total	**106**	**25**	**131**	**81%**

Land Grant institutions of higher education in the sample were 9% less likely to have sustainability integrated in their campus operations.

Table 37. Sustainability Operations – HBCU

HBCU	Sustainability Operations	No Sustainability Operations	Institutions	Percent Operations
No	95	18	113	84%
Yes	11	7	18	61%
Grand Total	**106**	**25**	**131**	**81%**

HBCU institutions were 23% less likely to have sustainability integrated in their campus operations compared to other institutions.

Table 38. Sustainability Operations – Location

Location	Sustainability Operations	No Sustainability Operations	Institutions	Percent Operations
City	76	15	91	84%
Rural	4	3	7	57%
Suburb	10	2	12	83%
Town	16	5	21	76%
Grand Total	**106**	**25**	**131**	**81%**

Institutions of higher education located in cities and suburbs were more likely to integrate sustainability in their campus operations compared to institutions in towns. Institutions in rural areas were the least likely to incorporate sustainability in their operations.

Table 39. Sustainability Operations – Locale Detail

Locale Detail	Sustainability Operations	No Sustainability Operations	Institutions	Percent Operations
City: Large	34	3	37	92%
City: Midsize	21	10	31	68%
City: Small	21	2	23	91%
Rural: Fringe	2	3	5	40%
Rural: Remote	2	0	2	100%
Suburb: Large	9	2	11	82%
Suburb: Small	1	0	1	100%
Town: Distant	5	3	8	63%
Town: Fringe	2	1	3	67%
Town: Remote	9	1	10	90%
Grand Total	**106**	**25**	**131**	**81%**

There was a wide range of sustainability in operations, with the lowest score of 40% in Rural: Fringe. The highest participation was 100% of Rural: Remote institutions and Suburb: Small that incorporated sustainability in their operations.

Table 40. Sustainability Operations – Control of Institution

Control	Sustainability Operations	No Sustainability Operations	Institutions	Percent Operations
Private	30	13	43	70%
Public	76	12	88	86%
Grand Total	**106**	**25**	**131**	**81%**

Public institutions of higher education were 16% more likely to include sustainability in their operations than private institutions were.

Table 41. Sustainability Operations – Highest Level Degree Offered

Highest Degree Offered	Sustainability Operations	No Sustainability Operations	Institutions	Percent Operations
Bachelor's degree	4	0	4	100%
Doctor's degree	89	16	105	85%
Master's degree	12	9	21	57%
Post-master's certificate	1	0	1	100%
Grand Total	**106**	**25**	**131**	**81%**

Institutions of higher education with a bachelor's degree, or post-master's certificate as the highest degree offered were most likely to include sustainability in their operations.

Table 42. Sustainability Operations – Enrollment Size

Enrollment	Sustainability Operations	No Sustainability Operations	Institutions	Percent Operations
Under 1,000	3	6	9	33%
1,000 - 4,999	28	11	39	72%
5,000 - 9,999	27	6	33	82%
10,000 - 19,999	22	2	24	92%
20,000 and above	26		26	100%
Grand Total	**106**	**25**	**131**	**81%**

The larger the institution, the more likely they were to include sustainability in their operations. All institutions with more than 20,000 students included sustainability in their operations. Institutions with less than 1,000 students were the least likely to include sustainability in their operations.

Table 43. Sustainability Operations – Carnegie Classification

Carnegie Classification	Sustainability Operations	No Sustainability Operations	Institutions	Percent Operations
Baccalaureate Colleges: Arts & Sciences Focus	7	3	10	70%
Baccalaureate Colleges: Diverse Fields	2	2	4	50%
Doctoral Universities: High Research Activity	18	2	20	90%
Doctoral Universities: Very High Research Activity	27	0	27	100%
Doctoral/Professional Universities	10	4	14	71%
Master's Colleges & Universities: Larger Programs	28	4	32	88%
Master's Colleges & Universities: Medium Programs	3	5	8	38%
Master's Colleges & Universities: Small Programs	2	1	3	67%
Special Focus Four-Year: Medical Schools & Centers	2	3	5	40%
Special Focus Four-Year: Other Health Professions Schools	1	1	2	50%
Special Focus Four-Year: Research Institutions	6	0	6	100%
Grand Total	**106**	**25**	**131**	**81%**

Doctoral universities were more likely to include sustainability in their operations. As their research funding increased, they were more likely to include sustainability in their campus operations. All High Research Activity universities included sustainability in their operations.

Table 44. Sustainability Operations – Carnegie Classification 2021: Enrollment Profile

Enrollment Profile	Sustainability Operations	No Sustainability Operations	Institutions	Percent Operations
Exclusively graduate	3	2	5	60%
Exclusively undergraduate four-year	4	0	4	100%
High undergraduate	55	5	60	92%
Majority graduate	8	4	12	67%
Majority undergraduate	17	2	19	89%
Very high undergraduate	19	12	31	61%
Grand Total	**106**	**25**	**131**	**81%**

Institutions of higher education with a higher percentage of undergraduate students were more likely to include sustainability in their operations.

Table 45. Sustainability Operations – Carnegie Classification 2021: Undergraduate Profile

Enrollment Profile	Sustainability Operations	No Sustainability Operations	Institutions	Percent Operations
Four-year, full-time, inclusive, higher transfer-in	22	3	25	88%
Four-year, full-time, inclusive, lower transfer-in	7	6	13	54%
Four-year, full-time, more selective, higher transfer-in	6	0	6	100%
Four-year, full-time, more selective, lower transfer-in	9	0	9	100%
Four-year, full-time, selective, higher transfer-in	9	1	10	90%
Four-year, full-time, selective, lower transfer-in	19	2	21	90%
Four-year, higher part-time	7	1	8	88%
Four-year, medium full-time , selective, higher transfer-in	11	1	12	92%
Four-year, medium full-time, inclusive, higher transfer-in	13	7	20	65%
Four-year, medium full-time, inclusive, lower transfer-in	0	1	1	0%
Four-year, medium full-time, selective, lower transfer-in	0	1	1	0%
Not classified (Exclusively Graduate)	3	2	5	60%
Grand Total	**106**	**25**	**131**	**81%**

Those with a higher rate of full-time students were more likely to include sustainability in their operation than those schools with fewer full-time students. Selective enrollment institutions were more likely to include sustainability in their operations than were inclusive institutions.

Table 46. Sustainability Operations – Carnegie Classification 2021: Size and Setting

Enrollment Profile	Sustainability Operations	No Sustainability Operations	Institutions	Percent Operations
Exclusively graduate/professional	3	2	5	60%
Four-year, large, highly residential	2	0	2	100%
Four-year, large, primarily nonresidential	21	1	22	95%
Four-year, large, primarily residential	17	0	17	100%
Four-year, medium, highly residential	11	3	14	79%
Four-year, medium, primarily nonresidential	11	2	13	85%
Four-year, medium, primarily residential	21	3	24	88%
Four-year, small, highly residential	13	3	16	81%
Four-year, small, primarily nonresidential	1	2	3	33%
Four-year, small, primarily residential	3	3	6	50%
Four-year, very small, highly residential	2	4	6	33%
Four-year, very small, primarily nonresidential	1	2	3	33%
Grand Total	**106**	**25**	**131**	**81%**

Larger institutions were more likely to include sustainability in their operations. Institutions with a higher level of residential students were more likely to include sustainability in their operations than were schools with more nonresidential students.

Table 47. Sustainability Operations – State

State	Sustainability Operations	No Sustainability Operations	Institutions	Percent Operations
AL	11	4	15	73%
FL	24	1	25	96%
LA	14	4	18	78%
MS	7	4	11	64%
TX	50	12	62	81%
Grand Total	**106**	**25**	**131**	**81%**

The majority of institutions of higher education in the Gulf South include some sustainability in their operations. This ranged from 64% in Mississippi to 96% in Florida.

Table 48. Sustainability Operations – EPSCoR

EPSCOR STATE	Sustainability Operations	No Sustainability Operations	Institutions	Percent Operations
No	74	13	87	85%
Yes	32	12	44	73%
Grand Total	**106**	**25**	**131**	**81%**

Institutions of higher education in the Gulf South were more likely to include sustainability in their operations in non-EPSCoR states. EPSCoR states were 12% less likely to include sustainability in their operations.

Table 49. Sustainability Operations – EPSCoR & State

EPSCOR & State	Sustainability Operations	No Sustainability Operations	Institutions	Percent Operations
No	74	13	87	85%
FL	24	1	25	96%
TX	50	12	62	81%
Yes	32	12	44	73%
AL	11	4	15	73%
LA	14	4	18	78%
MS	7	4	11	64%
Grand Total	**106**	**25**	**131**	**81%**

Overall, institutions of higher education in the Gulf South were likely to include some sustainability in their campus operations. Florida was not an EPSCoR state and 96% of their institutions include sustainability in their operations. The state least likely to offer sustainability in their operations was an EPSCoR state (Mississippi).

Leadership related to sustainability

Leadership related to sustainability would include university wide policies promoting environmental sustainability or signed declarations in support of sustainability in the institution. The mission statement, or the vision statement, at fourteen of the schools included a commitment to sustainability. Signing the Talloires Declaration shows a commitment by leadership, and eleven schools were signatories. Forty-eight percent of institutions of higher education in the sample had leadership engaged in sustainability. The tables below illustrate in greater detail the leadership related to sustainability by institutional characteristics.

Table 50. Sustainability Leadership – Land Grant Institution

Land Grant	Sustainability Leadership	No Sustainability Leadership	Institutions	Percent Leadership
No	55	65	120	46%
Yes	8	3	11	73%
Grand Total	**63**	**68**	**131**	**48%**

Land Grant institutions of higher education were 27% more likely to have leadership that promoted sustainability in their mission statement, vision statement, participated in a sustainability ranking system, or signed a declaration committing to sustainability.

Table 51. Sustainability Leadership – HBCU

HBCU	Sustainability Leadership	No Sustainability Leadership	Institutions	Percent Leadership
No	59	54	113	52%
Yes	4	14	18	22%
Grand Total	**63**	**68**	**131**	**48%**

HBCU institutions of higher education were 30% less likely to have sustainability championed by leadership, compared to other institutions.

Table 52. Sustainability Leadership – Location

Location	Sustainability Leadership	No Sustainability Leadership	Institutions	Percent Leadership
City	47	44	91	52%
Rural	1	6	7	14%
Suburb	9	3	12	75%
Town	6	15	21	29%
Grand Total	**63**	**68**	**131**	**48%**

Institutions of higher education located in suburbs were most likely to have leadership committed to sustainability. On the other end of the range, institutions in rural areas only had 14% of their leadership that promoted sustainability.

Table 53. Sustainability Leadership – Locale Detail

Locale Detail	Sustainability Leadership	No Sustainability Leadership	Institutions	Percent Leadership
City: Large	22	15	37	59%
City: Midsize	16	15	31	52%
City: Small	9	14	23	39%
Rural: Fringe	1	4	5	20%
Rural: Remote	0	2	2	0%
Suburb: Large	9	2	11	82%
Suburb: Small	0	1	1	0%
Town: Distant	1	7	8	13%
Town: Fringe	0	3	3	0%
Town: Remote	5	5	10	50%
Grand Total	**63**	**68**	**131**	**48%**

Schools located in large suburbs were most likely to have leadership committed to sustainability, with the next group (large cities) being 23% less likely to have leadership committed to sustainability.

Table 54. Sustainability Leadership – Control of Institution

Control	Sustainability Leadership	No Sustainability Leadership	Institutions	Percent Leadership
Private	23	20	43	53%
Public	40	48	88	45%
Grand Total	**63**	**68**	**131**	**48%**

Private institutions of higher education were 8% more likely to have leadership committed to sustainability than public institutions were.

Table 55. Sustainability Leadership – Highest Level Degree Offered

Highest Degree Offered	Sustainability Leadership	No Sustainability Leadership	Institutions	Percent Leadership
Bachelor's degree	2	2	4	50%
Doctor's degree	55	50	105	52%
Master's degree	6	15	21	29%
Post-master's certificate	0	1	1	0%
Grand Total	**63**	**68**	**131**	**48%**

Institutions of higher education offering doctoral degrees were most likely to have leadership committed to sustainability. Institutions offering post-master's certificates and master's degrees were least likely to have leadership committed to sustainability.

Table 56. Sustainability Leadership – Enrollment Size

Enrollment	Sustainability Leadership	No Sustainability Leadership	Institutions	Percent Leadership
Under 1,000	1	8	9	11%
1,000 - 4,999	15	24	39	38%
5,000 - 9,999	13	20	33	39%
10,000 - 19,999	11	13	24	46%
20,000 and above	23	3	26	88%
Grand Total	**63**	**68**	**131**	**48%**

The larger the institutional enrollment, the more likely leadership would be committed to sustainability. Institutions with more than 20,000 students were most likely to be committed to sustainability. Institutions with less than 1,000 students were the least likely to have leadership committed to sustainability.

Table 57. Sustainability Leadership – Carnegie Classification

Carnegie Classification	Sustainability Leadership	No Sustainability Leadership	Institutions	Percent Leadership
Baccalaureate Colleges: Arts & Sciences Focus	5	5	10	50%
Baccalaureate Colleges: Diverse Fields	0	4	4	0%
Doctoral Universities: High Research Activity	10	10	20	50%
Doctoral Universities: Very High Research Activity	26	1	27	96%
Doctoral/Professional Universities	8	6	14	57%
Master's Colleges & Universities: Larger Programs	10	22	32	31%
Master's Colleges & Universities: Medium Programs	1	7	8	13%
Master's Colleges & Universities: Small Programs	0	3	3	0%
Special Focus Four-Year: Medical Schools & Centers	0	5	5	0%
Special Focus Four-Year: Other Health Professions Schools	0	2	2	0%
Special Focus Four-Year: Research Institutions	3	3	6	50%
Grand Total	**63**	**68**	**131**	**48%**

Universities with a Very High Research rating by Carnegie were the most likely to engage in research related to sustainability. There was only one institution that did not include sustainability in their mission statement, sign a commitment to sustainability, or otherwise promote sustainability at the institutional level.

Table 58. Sustainability Leadership – Carnegie Classification 2021: Enrollment Profile

Enrollment Profile	Sustainability Leadership	No Sustainability Leadership	Institutions	Percent Leadership
Exclusively graduate	2	3	5	40%
Exclusively undergraduate four-year	2	2	4	50%
High undergraduate	33	27	60	55%
Majority graduate	3	9	12	25%
Majority undergraduate	13	6	19	68%
Very high undergraduate	10	21	31	32%
Grand Total	**63**	**68**	**131**	**48%**

Institutions of higher education with some graduate programs, but a higher percentage of undergraduate students, were more likely to have leadership committed to sustainability. Exclusively graduate and majority graduate averages 33% of their leadership committing to sustainability. The other four categories that were exclusively

or majority undergraduate averaged 51% of their leadership being committed to sustainability.

Table 59. Sustainability Leadership – Carnegie Classification 2021: Undergraduate Profile

Enrollment Profile	Sustainability Leadership	No Sustainability Leadership	Institutions	Percent Leadership
Four-year, full-time, inclusive, higher transfer-in	8	17	25	32%
Four-year, full-time, inclusive, lower transfer-in	3	10	13	23%
Four-year, full-time, more selective, higher transfer-in	6	0	6	100%
Four-year, full-time, more selective, lower transfer-in	7	2	9	78%
Four-year, full-time, selective, higher transfer-in	8	2	10	80%
Four-year, full-time, selective, lower transfer-in	12	9	21	57%
Four-year, higher part-time	5	3	8	63%
Four-year, medium full-time , selective, higher transfer-in	8	4	12	67%
Four-year, medium full-time, inclusive, higher transfer-in	4	16	20	20%
Four-year, medium full-time, inclusive, lower transfer-in	0	1	1	0%
Four-year, medium full-time, selective, lower transfer-in	0	1	1	0%
Not classified (Exclusively Graduate)	2	3	5	40%
Grand Total	**63**	**68**	**131**	**48%**

Selective enrollment institutions averaged 64% and inclusive institutions averaged 30% of leadership committing to sustainability.

Table 60. Sustainability Leadership – Carnegie Classification 2021: Size and Setting

Enrollment Profile	Sustainability Leadership	No Sustainability Leadership	Institutions	Percent Leadership
Exclusively graduate/professional	2	3	5	40%
Four-year, large, highly residential	1	1	2	50%
Four-year, large, primarily nonresidential	16	6	22	73%
Four-year, large, primarily residential	15	2	17	88%
Four-year, medium, highly residential	10	4	14	71%
Four-year, medium, primarily nonresidential	5	8	13	38%
Four-year, medium, primarily residential	7	17	24	29%
Four-year, small, highly residential	5	11	16	31%
Four-year, small, primarily nonresidential	0	3	3	0%
Four-year, small, primarily residential	1	5	6	17%
Four-year, very small, highly residential	1	5	6	17%
Four-year, very small, primarily nonresidential	0	3	3	0%
Grand Total	**63**	**68**	**131**	**48%**

Schools with more residential students averaged 43% of leadership committing to sustainability and schools with more nonresidential students averaged 30% of leadership committing to sustainability.

Table 61. Sustainability Leadership – State

State	Sustainability Leadership	No Sustainability Leadership	Institutions	Percent Leadership
AL	4	11	15	27%
FL	18	7	25	72%
LA	6	12	18	33%
MS	3	8	11	27%
TX	32	30	62	52%
Grand Total	**63**	**68**	**131**	**48%**

Less than half of institutions of higher education in the Gulf South have leadership that have committed to sustainability. This ranged from 27% in Alabama and Mississippi to 72% in Florida.

Table 62. Sustainability Leadership – EPSCoR

EPSCOR STATE	Sustainability Leadership	No Sustainability Leadership	Institutions	Percent Leadership
No	50	37	87	57%
Yes	13	31	44	30%
Grand Total	**63**	**68**	**131**	**48%**

Leadership at institutions of higher education in the Gulf South were 27% more likely to commit to sustainability in non EPSCoR states.

Table 63. Sustainability Leadership – EPSCoR & State

EPSCOR & State	Sustainability Leadership	No Sustainability Leadership	Institutions	Percent Leadership
No	50	37	87	57%
FL	18	7	25	72%
TX	32	30	62	52%
Yes	13	31	44	30%
AL	4	11	15	27%
LA	6	12	18	33%
MS	3	8	11	27%
Grand Total	**63**	**68**	**131**	**48%**

Institutions of higher education in non EPSCoR states are more likely to have leadership committed to sustainability. This range was from 27% in Alabama and Mississippi to 72% in Florida.

Table 64. Open Ended Responses

The last survey question was open ended, and the responses are included here. All university names were removed from the responses to ensure universities remain anonymous. One of the responses states that their definition of sustainability is more holistic. Several of the responses indicate that sustainability projects are grass roots efforts. In general, these comments from respondents correspond with the literature review and results of this research project.

I think asking about the level of senior administration leadership and support would be important. This survey defines sustainability as "environmental sustainability" whereas our definition and approach is holistic: Nature, Economy, Society, Wellbeing are the four interdependent system conditions of sustainability and we address all of them within a framework of sustainability here at x University.
Limited recycling collection is handled by a student group during Fall and Spring semesters. Recycling does not take place at other times during the year. The collected recyclables are put in a dumpster provided by the parish for campus and community use. The Keep Louisiana Beautiful University Affiliate program has helped to bring some sustainability practices to campus.
x has built two geothermal dorm buildings on campus as well as incorporate edible landscapes across campus. We are continuing to work the our utility providers, Entergy and Atmos, to implement more efficient building operating practices through incentive programs that are offered by them. Various energy efficient lighting projects have been completed over the past few years decreasing energy consumption.
The Office of Sustainability is currently developing a Sustainability Master Plan with input from the Campus Sustainability Advisory Committee. The Committee is comprised of students, staff, and faculty from across campus to account for the various campus perspectives.

Until recently we have been a small graduate university educating health care professionals. Our fee was voted in by the students in 2010 to fund environmental sustainability improvements on campus. That fee has been able to fund projects that Operations wouldn't have funded otherwise like the x Community Garden, part-time staff positions for the garden and a student worker, Annual Transit Passes, rewards for labs who do sustainable actions, bike share and maintenance, outreach events, a composting program, EV Chargers, ultra-low freezer purchasing assistance, more recycling services, etc. All of our programs and ideas come through the Sustainability Office and Sustainability Committee (representatives from around campus) and are therefore not mandated by our administration.
We have many different recycling programs based on the materials, and we have purchased green grounds equipment. Additionally, we have just purchased our first hybrid vehicles for facilities use.
The university leverages the state contract for paper.
Office of Sustainability is 3 FTE 3 Graduate students 1 Undergraduate student worker
The general lack of environmental awareness in x is shocking. There are some efforts in the community but no interest or activity for the most part from the campus.

The university is preparing to build our first roof-top solar project and will start retrofitting buildings to take advantage of the energy/cost savings of LEDs. We also implemented a university provided access book program to our 4,000 undergraduate students reducing the environmental impact of printing, shipping, and ultimately deposing physical textbooks.
This survey sparked the conversation to focus on more environmentally sustainable operations.

Fifty-three institutions, or forty percent, of the institutions of higher education in the Gulf South included sustainability in their academics, research, operations and leadership. Thirty-nine were in cities, eight were in suburbs, six were in towns, and none were located in rural areas.

The research results highlight the academic, research, operations and leadership activities regarding sustainability in institutions of higher education in the Gulf South. There were trends regarding the characteristics of the schools that will be discussed in the next chapter.

Chapter 5: Discussion

Institutions of higher education have the opportunity to leverage their campuses as living laboratories. Campus leadership, operations, research and academics can work together to create an environmentally sustainable campus that engages students and builds community. This exploratory study examines institutions of higher education in the Gulf South to find out what environmental sustainability practices they have in place and to analyze if there are trends related to university characteristics. The primary question is: what sustainability practices do universities in the Gulf South have in place on their campus? The second main question is: are certain types of universities more likely to incorporate environmental sustainability practices on their campus?

Leadership support of sustainability

Developing the governance framework to transform institutions of higher education integrates sustainability into management, research, teaching and operations (Bauer et al., 2021). Leadership plays a pivotal role in holistic management models (Kohl, 2022). The whole institution approach to sustainability in campuses requires leadership involvement at the highest levels (Bauer et al., 2021, Ferrer-Balas et al., 2008).

Less than half of institutions of higher education in the Gulf South have university wide policies promoting environmental sustainability or signed declarations in support of sustainability in higher education. Sixty-three institutions, or forty-eight percent, promoted sustainability at the institutional level. There were several characteristics of institutions that stood out in the data analysis. Leadership support of sustainability had

the lowest score in the sample population, which supports prior research. Cheeseman et al. found that the incorporation of sustainable best practices into the management and operations of campuses was lacking (2019).

Land grant status

Seventy-three percent of land grant institutions demonstrated sustainability at the highest level through mission statements, declarations, or other university wide commitments. Land grant institutions were twenty-seven percent more likely to have leadership committed to sustainability. Non land grant institutions had a forty-six percent commitment to environmental sustainability by leadership. Land grant institutions receive federal funding for education, research and extension services. Extension services ensure that research is disseminated to the public (Bickell, 2022). Leadership at these institutions are required by their funding to focus institutional resources on current topics and then communicate their success to the public.

Urban or rural campuses

Schools located in the suburbs had seventy-five percent of leadership commitment to sustainability, as opposed to fourteen percent in rural institutions. More than eighty percent of the population is located in urban areas, but only fifty-two percent of the leadership at urban schools prioritized sustainability. Researchers have indicated that cities have unique challenges for extension services and other university outreach to the local community (Fox et al, 2017). If leadership is not demonstrating a commitment to sustainability on their own campus, then leadership may not be supporting faculty efforts to engage the local community.

Research activity

Twenty-six of the twenty-seven Very High Research Activity institutions had leadership committed to sustainability. This was a ninety-six percent rate, which is twice the forty-eight percent average of all other institutions. This finding supports the Heuristic Framework by Gwilliam that addresses capacity and commitment (2023). Financial resources, including sponsored research, help leadership support university efforts to holistically integrate sustainability into the campus.

Annual enrollment size

Institutions with student enrollment exceeding 20,000 had an eighty-eight percent of leadership committed to sustainability as opposed to eleven percent at schools with less than 1,000 students. The size and wealth of an institution were found to be factors for universities to adopt sustainable practices (Stafford, 2011). Leadership at larger schools may also be influenced by their alumni, students and faculty to promote environmental sustainability.

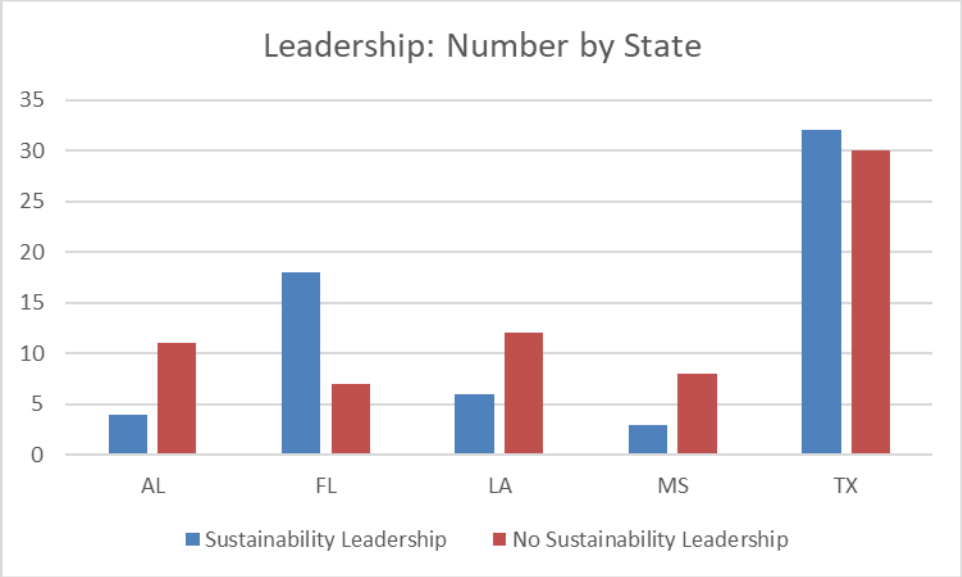
Highest degree offered

Schools that offer doctoral degrees have a fifty-two percent leadership participation rate in sustainability. Schools that offer a bachelor's degree as the highest degree are close at fifty percent.

Fourteen institutions included sustainability in their mission statement, vision statement, or value statement. Eleven campuses signed the Talloires Declaration to incorporate sustainability and environmental literacy into their operations, research and teaching. Seventeen schools signed one of the Presidents' Climate Leadership

Commitments housed at the Sustainability Institute at the University of New Hampshire. Thirty-four institutions have scores in the Sustainability Tracking, Assessment & Rating System (STARS) hosted by the Association for the Advancement of Sustainability in Higher Education. The majority of the commitments to sustainability were to external constituents and not codified in mission statements, vision statements or value statements that are distributed on campus.

Figure 3. Leadership by State



The rate of leadership commitment to sustainability varied across states. The EPSCoR states of Mississippi, Alabama and Louisiana had lower scores and the non-EPSCoR states of Texas and Florida had higher scores (Figure 3). Less than half of schools in the study have leadership committed to sustainability, but schools in Florida have seventy-two percent of their leadership committed to sustainability.

There were two schools in the study that included sustainability in their mission, vision or value statements, signed the Talloires Declaration, signed the Presidents' Climate Leadership Commitments and have STARS scores. Both schools are in the state of Florida, located in cities, and offer doctoral degrees but their enrollment is

majority undergraduate. One institution is a large public school, with Very High Research activity and more than 20,000 students; the other is a private school, with lower research activity and their enrollment is 1,000-5,000 students. Future research could be done to determine why Florida institutions of higher education have a stronger managerial commitment to sustainability.

Degrees, minors, or certificates related to environmental sustainability

Eighty-two percent of institutions of higher education in the Gulf South offered degrees, minors or certifications related to sustainability. This area has the highest participation rate, closely followed by operations at eighty-one percent. Engaging pedagogies improve the knowledge retained by students regarding environmental sustainability (Michael and Zwickle, 2021). The Whole Institution Approach views students as valuable stakeholders who can help improve their campus.

Land grant status

All the land grant institutions in the Gulf South offer degrees, minors or certificates related to environmental sustainability. This is an expected outcome since they have dedicated federal funding for research and extension services. At their founding, most land grant campuses were located in small towns or rural areas (Diner, 2013). In this sample one land grant campus was in a rural area, three were in towns and seven were in cities.

Urban or rural campuses

Schools located in towns and rural areas are tied at eighty-six percent offering academic programs or certificates related to sustainability topics. Because most

university research stations are in rural areas this was an expected outcome. Cities are in a close second at eighty-one percent offering academics related to sustainability. This supports prior research that urban schools are offering more sustainable and resilient options to better serve their modern constituencies (Parikh et al, 2022). Institutions in the suburbs were least likely to have academic programming around sustainability at seventy-five per cent.

Research activity

Doctoral Institutions with Very High Research Activity have one hundred per cent of their schools offering academic programs related to environmental sustainability. Faculty members are expected to generate external funding at research universities but are allowed to perform research in areas of interest to them (Anderson and Slade, 2015). This indicates that faculty at highly funded research institutions are interested in sustainability in academics and sponsored research.

Annual enrollment size

The larger the annual enrollment size, the more likely academic programs will be offered around environmental sustainability in this sample population. Or schools with these academic programs have a higher enrollment, any causation is to be determined. Stanford did not find sustainability to be a driving factor for school selection, but something that students become more interested in during their college studies (2011).

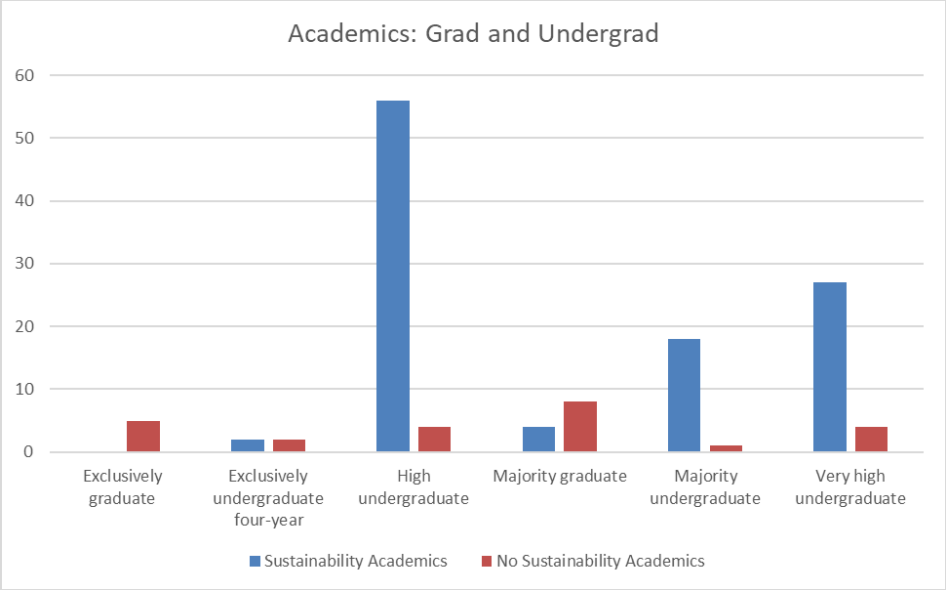
Highest degree offered

Fifty percent of schools that offered a bachelor's degree as their highest degree had academic programs related to environmental sustainability. This increased to

seventy-six percent for master's degrees, and eighty-four percent for doctor's degrees. There was one school with the highest degree of post-master's certificates, and it offered academic programming related to environmental sustainability. The literature was lacking in a direct tie to highest degree offered. However, size, wealth, and capacity are factors in adopting sustainable practices and these schools may have more financial resources (Stafford, 2011; Gwilliam et al, 2023).

An interesting item that emerged in the data is that schools with graduate degrees, but higher percentages of undergraduate students were more likely to offer academic programming in environmental sustainability (Figure 4).

Figure 4. Academics Mix Grad and Undergrad



Another unexpected trend that emerged from the data was that selective schools were more likely to offer academic programming around sustainability than were inclusive enrollment schools. Only two of the selective admission schools did not offer academic programming for environmental sustainability.

An area for future research is how the composition of students relates to environmental sustainability in academic programming and other areas of campus. In

addition to the size of the institution, the highest degree offered, admissions policies, percent undergraduate students and other factors could be topics for future research.

Faculty research related to environmental sustainability

The federal government had provided funding to higher education since the establishment of land grant universities under the Morrill Act in 1862. It is through this funding that the three functional pillars of American universities were established: education, research and extension (Croft, 2019).

Seventy-two percent of institutions of higher education in the Gulf South engage in research related to environmental sustainability. This is ten percentage points lower than the academic programming related to environmental sustainability.

Land grant status

The eleven land grant institutions in the sample all participate in research related to environmental sustainability. This is compared to sixty-nine percent of non-land grant institutions. The federal funding dedicated to land grant institutions for research and extension services makes this an expected outcome. The Hatch Act Of 1887 created agricultural research stations, which were paired with land grants. By 2022 the appropriations under the Hatch Act exceeded two-hundred million dollars (National Institute of Food and Agriculture, 2023). Extension services funding and the National Sea Grant program provide additional funding to land grant institutions for research, and some of that is focused on sustainability topics.

Urban or rural campuses

The highest number of campuses engaged in research for sustainability are located in cities. There are sixty-six schools in cities that engaged in research related to environmental sustainability, which means seventy-three percent of schools in cities engage in research for sustainability. The second highest number of campuses are in towns, with sixteen schools. In towns schools have the highest percentage rate engaged in research for sustainability at seventy-six percent. Campuses in rural areas have the lowest number of schools at four, and the lowest percent of engagement at fifty-seven percent. The American system for higher education grew from campuses primarily located in rural areas (Diner, 2013). As the country has become more urban, so have universities with sixty-eight percent in urban areas (APLU, 2023).

Research activity

A firm majority of institutions are engaged in research for environmental sustainability with a percentage rate of seventy-two percent. One hundred percent of the Doctoral Universities: Very High Research Activity are engaged in research related to environmental sustainability. Ninety-five percent of Doctoral Universities: High Research Activity are engaged in research for sustainability. Higher education lives in a competitive market that must leverage state funding, secure grant funding, and achieve rankings and accreditation (Leech, et al, 2014). The literature did not have a direct tie to sustainability, highest degree earned and research activity. However, university rankings, such as the Carnegie Classification for research, influence the students who enroll and the employees who apply at schools.

Annual enrollment size

There is a correlation between enrollment size, where the larger the student population, the more likely there is research engagement around environmental sustainability. This ranges from schools with less than one thousand students having a twenty-two percent rate to schools with more than twenty thousand students having a one hundred percent engagement for research in environmental sustainability. This is similar to the trend for academic programming around environmental sustainability in this research. This supports Stafford's research that the size of an institution is a factor for universities to adopt sustainable practices (2011).

Highest degree offered

Schools who offer bachelor's degrees have a fifty-percent participation in research for sustainability. This goes to fifty-two percent for master's degrees and seventy-six percent for doctor's degrees. This is similar to the trend for academic programming around environmental sustainability. Institutions of higher education compete for limited pools of funding and are ranked against each other in various ranking programs (Leech, et al, 2014). There was not a direct tie in the literature to sustainability, highest degree earned and research activity. However, doctoral granting universities with higher levels of research funding were more likely to have faculty engaged in research on sustainability in this research.

The two non-EPSCoR states have sixty-four of the ninety-four institutions engaged in sustainability research; the three EPSCoR states only contain thirty of the schools engaged in research for sustainability (Figure 5). Seventy-four percent of the non-EPSCoR schools engage in research for environmental sustainability, compared to sixty-eight percent in EPSCoR states.

Figure 6. Research EPSCoR State

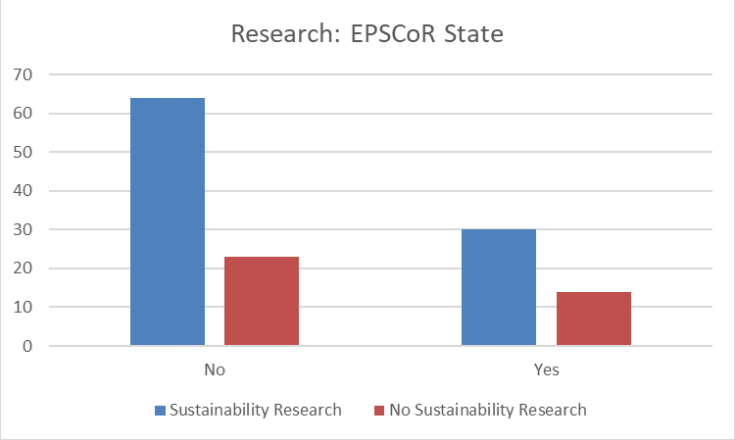
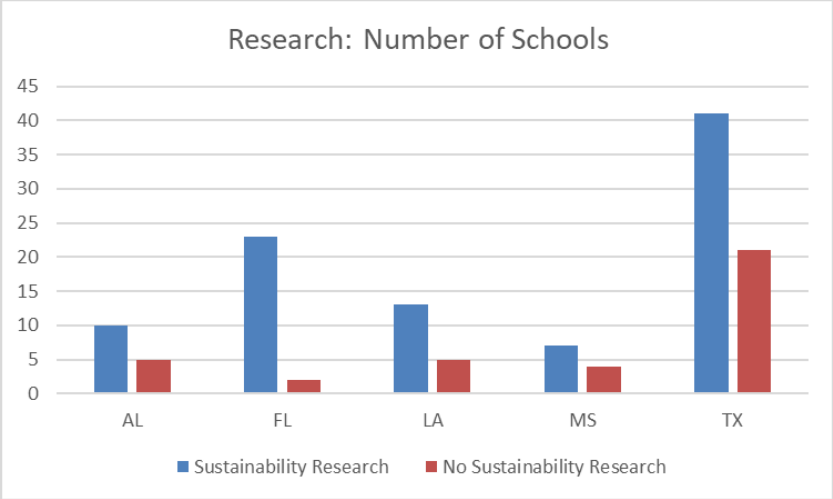


Figure 5. Research Number of Schools



Texas has the largest number of institutions engaged with research for sustainability with forty-one schools (Figure 6); the percent of schools engaged in research for sustainability was the second lowest at sixty-six percent. Florida has the second largest number of institutions engaged in research for sustainability with twenty-three schools; they have the highest percent of schools engaged in research for sustainability with ninety-two percent.

Gulf Coast states are in an area subject to hurricanes, coastal erosion and other environmental challenges. An area for future research is why Florida institutions have a ninety-two percent engagement in research for environmental sustainability. This is a significant difference from other states. The other states range from sixty-four to seventy-two percent engagement in research for environmental sustainability.

Campus operations for environmental sustainability

The embodiment of university values is the physical campus, which should align with the lessons taught in classrooms (Zhang et al., 2016). Cheeseman et al., performed a literature review focused on sustainability policy within higher education (2019). The review discovered a lack of how universities can incorporate best practices for environmental sustainability on their own campuses. They suggested that further efforts were required to make the operations of higher education more sustainable.

One hundred twenty of the institutions, or eighty-one percent, have some environmental sustainability in their operations. This is the sustainability sector at institutions that is second in participation, exceeded only by academic programming.

Land grant status

Seventy-three percent of land grant schools include sustainability in their operations. Other institutions include sustainability in their operations at a rate of eighty-two percent. In all other areas (academics, research and leadership) land grant institutions are more likely to include environmental sustainability in their programming. This aligns with the research by Kemp and Scoffham that universities can be disorganized and have internal contradictions (2021).

Urban or rural campuses

Cities were most likely to incorporate sustainability in their operations at an eighty-four percent participation rate. Rural campuses were significantly less likely to incorporate sustainability in their operations with only a fifty-seven percent participation rate. Some of the feedback in the surveys was that recycling was not offered in their more rural areas. There may be other challenges associated with location that are beyond the resources available on campus to overcome. Sanchez et al. found that universities have implemented sustainability efforts around their teaching, research and leadership (2013). Implementing more ethical behaviors to benefit local stakeholders for the greater good, and effectively communicating their efforts to the community, is an area of improvement in higher education (Sari et al, 2023).

Research activity

One hundred percent of Doctoral Universities: Very High Research Activity include sustainability in their operations. Ninety percent of Doctoral Universities: High Research Activity include sustainability in their operations. Overall, eighty-one percent of universities include sustainability in their operations. Gleason et al. proposed that a whole system approach where spatial (campus buildings and landscape), social (stakeholder interactions) and psychodidactic (teaching methods and content) components of the university all include sustainability (2020). Universities with higher levels of research activity may perform better in these metrics because they have more financial resources.

Annual enrollment size

All institutions with an enrollment size of twenty-thousand and above include sustainability in their operations. Those schools with less than one thousand students were least likely to include sustainability in operations with a participation rate of thirty-three percent. In all areas (academics, research, leadership, operations) schools with an enrollment exceeding twenty thousand were most likely to engage in environmental sustainability. This research supports Stafford's research that larger institutions are more likely to adopt sustainable practices (2011).

Highest degree offered

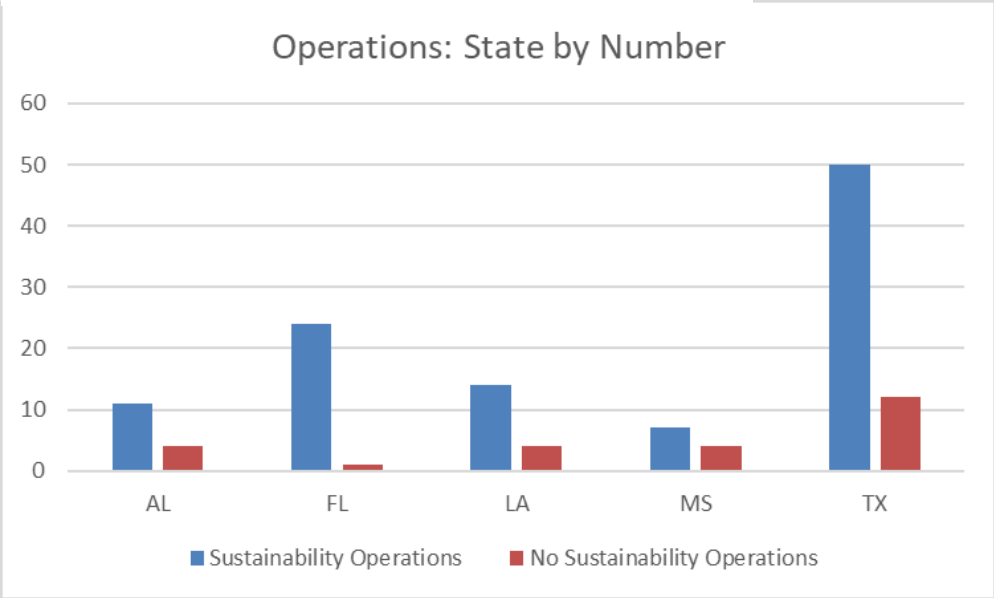
The four schools where the highest degree offered is a bachelor's degree include sustainability in their operations. Institutions that award Doctor's degrees have the highest number of institutions at eighty-nine, but their participation rate is lower at eighty-five percent. Ryan found that students are frustrated when there is a disconnect between the lessons learned in the classroom and the lack of sustainable practices on campus (2018).

In all other areas of this research, exclusively undergraduate four-year schools averaged a fifty percent participation rate. In sustainable operations all of the four-year schools include sustainability in their operations. Exclusively graduate schools were least likely to include sustainability in their operations at sixty percent.

EPSCoR states include sustainability in their operations at a rate of seventy-three percent. Non EPSCoR states include sustainability in their operations at a rate of eighty-five percent. Florida once again had the highest rate of participation; ninety-six

percent of schools include some sustainability in their operations (Figure 7). Future research could investigate why exclusively graduate schools, and EPSCoR states, were least likely to include sustainability in their operations.

Figure 7. Operations by State



Future Research

State budgets and regulations were beyond the scope of this project to determine if states, or university systems, mandate sustainability in higher education. This could be a topic for future research. Florida in particular is a state that could be researched to determine why they greatly outperformed other states in the region on sustainability initiatives. Additional information regarding the demographics of students at institutions may have been helpful in analyzing large variations of implementing environmental sustainability across institutions.

Chapter 6: Conclusion

Institutions of higher education are uniquely qualified, and positioned, to showcase environmental sustainability in a holistic manner encompassing education, research, leadership and operations. The purpose of this study was to determine the environmental sustainability practices at institutions of higher education in the Gulf South. Additionally, university characteristics were studied to see if schools with certain characteristics were more likely to implement environmental sustainability practices. The main characteristics reviewed were land grant status, location, research activity, annual enrollment size, and highest degree earned.

Land Grant Status

The Land-Grant College Act of 1862, or the Morrill Act of 1862, provided states with federal land grants to establish public colleges (Peshek, 2018). In 1890 the second Morrill Act was aimed toward former Confederate states and was intended to ensure that race would not prohibit attendance in colleges and universities (U.S. Congress, 1890). This legislation resulted in the creation of Historically Black Colleges and Universities.

The Hatch Act of 1887 added annual funding to land grant institutions to create and manage agricultural experiment stations. In 1914 the Smith-Lever Act added annual funding to land grant institutions to create and manage agricultural extension services. Federal legislation resulted in the three functional pillars of land grant institutions of higher education (Bickell, 2022). Teaching, research and extension services at land

grant institutions continue to have dedicated funding that is not available to other schools.

In this research, land grant institutions included environmental sustainability at higher rates than other schools. All land grant institutions included offered environmental sustainability in academics compared to eighty percent of non-land grant schools. For operations, all land grant institutions incorporate environmental sustainability compared to eighty-two percent of other institutions. In the area of research, all land grant institutions research environmental sustainability compared to sixty-nine percent of other schools. Seventy-three percent of land grant institutions have demonstrated leaderships commitment to sustainability, as opposed to forty-six percent at non land grant schools. Land grant institutions in this sample were more likely to include sustainability in their academics, operations, research and leadership.

Table 65. Land Grant Status Overview

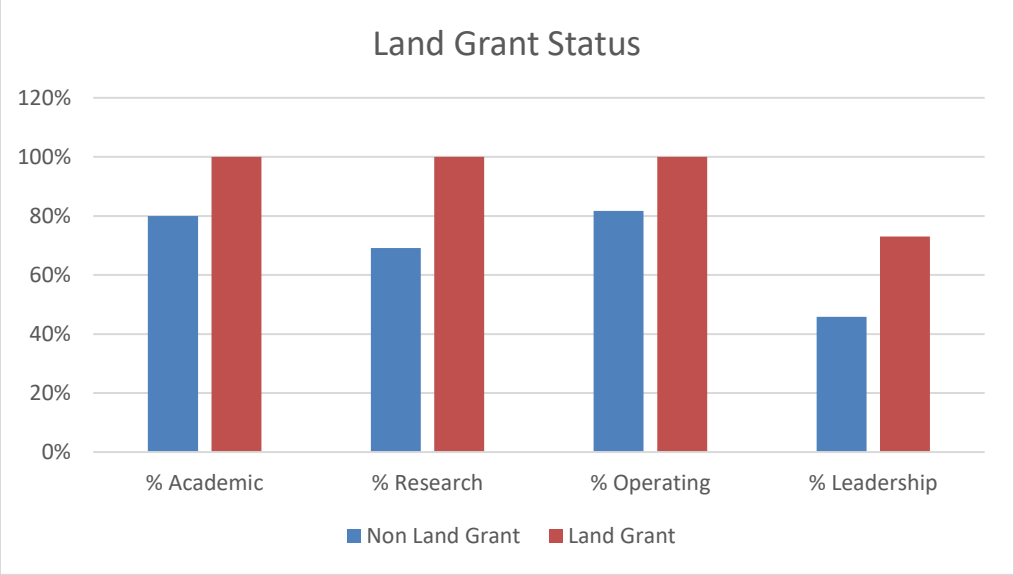
Academic	**Operating**	**Research**	**Leadership**	**No.**	**% Category**
Non Land Grant	*Non Land Grant*	*Non Land Grant*	*Non Land Grant*	*Non Land Grant*	*Non Land Grant*
No	No	No	No	10	8%
No	Yes	No	No	9	8%
No	Yes	No	Yes	3	3%
No	Yes	Yes	No	2	2%
Yes	No	No	No	6	5%
Yes	No	Yes	No	5	4%
Yes	No	Yes	Yes	1	1%
Yes	Yes	No	No	4	3%
Yes	Yes	No	Yes	5	4%
Yes	Yes	Yes	No	29	24%
Yes	Yes	Yes	Yes	46	38%
Land Grant	*Land Grant*	*Land Grant*	*Land Grant*	*Land Grant*	*Land Grant*
Yes	No	Yes	No	2	18%

Yes	No	Yes	Yes	1	9%
Yes	Yes	Yes	No	1	9%
Yes	Yes	Yes	Yes	7	64%

Table 66. Land Grant Percent by Area

Land Grant	% Academic	% Research	% Operating	% Leadership
Non Land Grant	80%	69%	82%	46%
Land Grant	100%	100%	100%	73%

Figure 8. Land Grant Percent by Area



Location

America's higher education system grew from campuses in mainly rural areas (Diner, 2013). As the population has shifted to mainly urban areas, universities are now sixty-three percent in urban areas (APLU, 2023). In this research population seventy-three percent of schools in cities participate in research for sustainability, compared to

fifty-seven in rural areas. Towns have the highest percent participation at seventy-six percent. Suburbs have sixty-seven percent participation of research in sustainability.

Universities in towns and rural areas are tied with eighty-six percent providing academics related to sustainability topics. Cities come in a close second at eighty-one percent. Schools located in suburbs are least likely to provide academics focused on sustainability at seventy-five percent. The values of a university are embodied in the physical campus and should align with the lessons learned in the classroom (Zhang et al, 2016).

Rural campuses were least likely to include sustainability in their operations at fifty-seven percent. Schools in cities were most likely to include sustainability in their operations at eighty-four percent. Campuses located in suburbs were one point less than schools in cities with eighty-three percent including sustainability in their operations. Towns included sustainability in their operations with a seventy-six participation rate.

Leadership ranged from a low of fourteen percent in rural institutions to a high of seventy-five percent in suburbs. Twenty-nine percent of schools located in towns have leadership commitments to sustainability. Only fifty-two percent of leadership in schools located in the city prioritize sustainability. More than eighty percent of the population reside in cities, where unique challenges exist for extension services and other university outreach activities (Fox et al, 2017).

Table 67. Location Overview

Academic	Operating	Research	Leadership	No.	% Category
City	*City*	*City*	*City*	*City*	*City*

No	No	No	No	7	8%
No	Yes	No	No	5	5%
No	Yes	No	Yes	3	3%
No	Yes	Yes	No	2	2%
Yes	No	No	No	5	5%
Yes	No	Yes	No	2	2%
Yes	No	Yes	Yes	1	1%
Yes	Yes	No	No	1	1%
Yes	Yes	No	Yes	4	4%
Yes	Yes	Yes	No	22	24%
Yes	Yes	Yes	Yes	39	43%
Rural	*Rural*	*Rural*	*Rural*	*Rural*	*Rural*
No	No	No	No	1	14%
Yes	No	Yes	No	1	14%
Yes	No	Yes	Yes	1	14%
Yes	Yes	No	No	2	29%
Yes	Yes	Yes	No	2	29%
Suburb	*Suburb*	*Suburb*	*Suburb*	*Suburb*	*Suburb*
No	No	No	No	2	17%
No	Yes	No	No	1	8%
Yes	Yes	No	Yes	1	8%
Yes	Yes	Yes	Yes	8	67%
Town	*Town*	*Town*	*Town*	*Town*	*Town*
No	Yes	No	No	3	14%
Yes	No	No	No	1	5%
Yes	No	Yes	No	4	19%
Yes	Yes	No	No	1	5%
Yes	Yes	Yes	No	6	29%
Yes	Yes	Yes	Yes	6	29%

Table 68. Location Percent by Area

Location	% Academic	% Research	% Operating	% Leadership
City	81%	73%	84%	52%
Rural	86%	57%	57%	14%
Suburb	75%	67%	83%	75%
Town	86%	76%	76%	29%

Figure 9. Location Percent by Area

Research

All Doctoral Universities Very High Research Activity included sustainability in operations, research and academics and ninety-six percent included in leadership. Doctoral Universities High Research Activity included sustainability in academic and research at a rate of ninety-five percent. They included sustainability in their operations at ninety percent and in leadership at fifty percent.

Doctoral Universities Doctoral/Professional Universities included sustainability in their academics at a rate of ninety-three percent. They included sustainability in research and operations at seventy-one percent of schools. The lowest category was leadership at fifty-seven percent.

Schools that did not have a Carnegie research classification were less likely to incorporate sustainability. They had the lowest engagement of sustainability in their academics at sixty-nine percent. Their research participation was the lowest at fifty-four

percent. For operations, they had the second lowest participation rate at seventy-three percent. In the area of leadership this group had the lowest participation at twenty-seven percent.

Table 69. Research Activity Overview

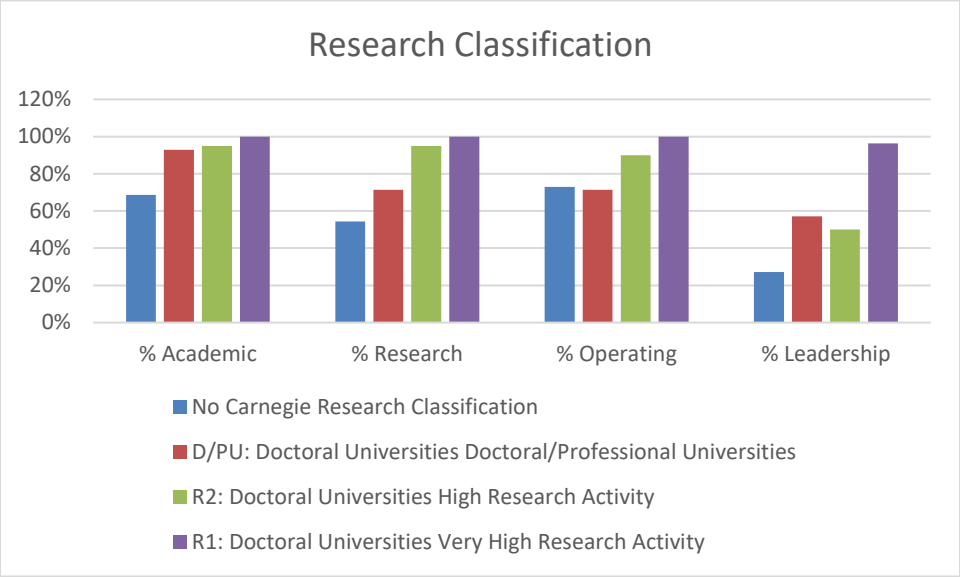
Research Activity (Classification)	Acad.	Op.	Res.	Ldr.	No.	% Category
No Carnegie Research Classification						
Special Focus Four-Year: Other Health Professions Schools	No	No	No	No	9	13%
Special Focus Four-Year: Research Institutions	No	Yes	No	No	8	11%
Special Focus Four-Year: Research Institutions	No	Yes	No	Yes	3	4%
Special Focus Four-Year: Research Institutions	No	Yes	Yes	No	2	3%
Master's Colleges & Universities: Small Programs	Yes	No	No	No	5	7%
Master's Colleges & Universities: Medium Programs	Yes	No	Yes	No	4	6%
Master's Colleges & Universities: Larger Programs	Yes	No	Yes	Yes	1	1%
Master's Colleges & Universities: Small Programs	Yes	Yes	No	No	4	6%
Master's Colleges & Universities: Larger Programs	Yes	Yes	No	Yes	3	4%
Master's Colleges & Universities: Small Programs	Yes	Yes	Yes	No	19	27%
Master's Colleges & Universities: Medium Programs	Yes	Yes	Yes	Yes	12	17%
D/PU: Doctoral Universities Doctoral/Professional Universities						
Doctoral/ Professional Universities	No	No	No	No	1	7%
Doctoral/ Professional Universities	Yes	No	No	No	1	7%
Doctoral/ Professional Universities	Yes	No	Yes	No	2	14%
Doctoral/	Yes	Yes	No	Yes	2	14%

Professional Universities						
Doctoral/ Professional Universities	Yes	Yes	Yes	No	2	14%
Doctoral/ Professional Universities	Yes	Yes	Yes	Yes	6	43%
R2: Doctoral Universities High Research Activity						
Doctoral Universities: High Research Activity	No	Yes	No	No	1	5%
Doctoral Universities: High Research Activity	Yes	No	Yes	No	1	5%
Doctoral Universities: High Research Activity	Yes	No	Yes	Yes	1	5%
Doctoral Universities: High Research Activity	Yes	Yes	Yes	No	8	40%
Doctoral Universities: High Research Activity	Yes	Yes	Yes	Yes	9	45%
R1: Doctoral Universities Very High Research Activity						
Doctoral Universities: Very High Research Activity	Yes	Yes	Yes	No	1	4%
Doctoral Universities: Very High Research Activity	Yes	Yes	Yes	Yes	26	96%

Table 70. Research Activity by Area

Research Classification	% Academic	% Research	% Operating	% Leadership
No Carnegie Research Classification	69%	54%	73%	27%
D/PU: Doctoral Universities Doctoral/ Professional Universities	93%	71%	71%	57%
R2: Doctoral Universities High Research Activity	95%	95%	90%	50%
R1: Doctoral Universities Very High Research Activity	100%	100%	100%	96%

Figure 10. Research Activity by Area



Annual Enrollment

All schools with enrollment exceeding twenty thousand students included sustainability in their academics, research and operations. They were most likely to have leadership committed to sustainability at eighty-eight percent. Schools with enrollment below one thousand students had the lowest rate of participation in academics, research, operations and leadership. As shown in Table 69, Table 70 and Figure 11, as each category of enrollment increases so does the rate of including sustainability in all areas (academic, operating, research, and leadership).

As enrollment increased, schools were more likely to include sustainability in their academic offerings. All institutions with enrollment exceeding twenty thousand students included sustainability in their academic offerings. There was a decrease of academic offerings related to sustainability in each enrollment grouping: 100%, 96%, 85%, 72%, 22%. Only twenty-two percent of schools with enrollment under one thousand students engaged in academics related to sustainability.

Schools were more likely to engage in research related to sustainability as enrollment increased. All schools with more than twenty thousand students engaged in research related to sustainability. The participation in research related to sustainability decreased with the enrollment group: 100%, 96%, 67%, 54%, 22%. Only twenty-two percent of schools with enrollment under one thousand students engaged in research related to sustainability.

The inclusion of sustainability in operations was also one hundred percent at schools with more than twenty thousand students. The participation of sustainability in operations decreased with the enrollment group: 100%, 92%, 82%, 72%, 33%. Only thirty-three percent of schools with enrollment under one thousand students included sustainability in their operations.

Sustainability and leadership also decreased with enrollment, but this is the only category that did not have full participation at those larger schools. Eighty-eight percent of schools exceeding twenty thousand in enrollment have leadership displaying a commitment to sustainability. This was the lowest scoring area in all school sizes, but decreased with each enrollment group: 88%, 46%, 39%, 38%, 11%. Schools with fewer than one thousand students displayed sustainability in leadership at eleven percent of schools.

Table 71. Annual Enrollment Size Overview

Academic	Operating	Research	Leadership	No.	% Category
Under 1,000					
No	No	No	No	5	56%
No	Yes	No	No	2	22%
Yes	No	Yes	No	1	11%

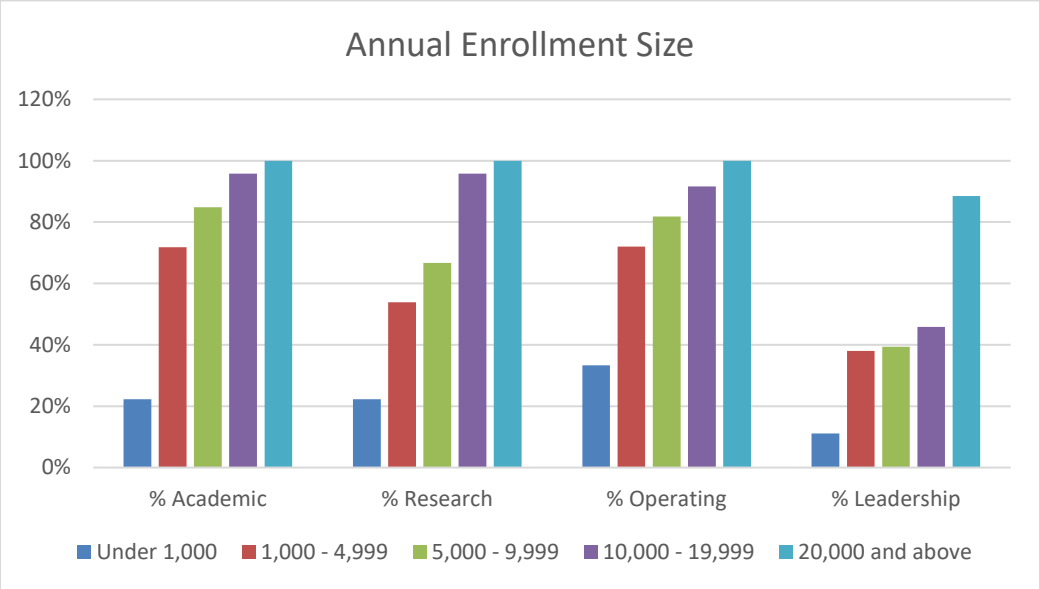
Yes	Yes	Yes	Yes	1	11%
1,000 - 4,999					
No	No	No	No	4	10%
No	Yes	No	No	4	10%
No	Yes	No	Yes	2	5%
No	Yes	Yes	No	1	3%
Yes	No	No	No	3	8%
Yes	No	Yes	No	4	10%
Yes	Yes	No	No	2	5%
Yes	Yes	No	Yes	3	8%
Yes	Yes	Yes	No	6	15%
Yes	Yes	Yes	Yes	10	26%
5,000 - 9,999					
No	Yes	No	No	3	9%
No	Yes	No	Yes	1	3%
No	Yes	Yes	No	1	3%
Yes	No	No	No	3	9%
Yes	No	Yes	No	1	3%
Yes	No	Yes	Yes	2	6%
Yes	Yes	No	No	2	6%
Yes	Yes	No	Yes	2	6%
Yes	Yes	Yes	No	10	30%
Yes	Yes	Yes	Yes	8	24%
10,000 - 19,999					
No	No	No	No	1	4%
Yes	No	Yes	No	1	4%
Yes	Yes	Yes	No	11	46%
Yes	Yes	Yes	Yes	11	46%
20,000 and above					
Yes	Yes	Yes	No	3	12%
Yes	Yes	Yes	Yes	23	88%

Table 72. Annual Enrollment Size by Area

Annual Enrollment	% Academic	% Research	% Operating	% Leadership
Under 1,000	22%	22%	33%	11%
1,000 - 4,999	72%	54%	72%	38%

5,000 - 9,999	85%	67%	82%	39%
10,000 - 19,999	96%	96%	92%	46%
20,000 and above	100%	100%	100%	88%

Figure 11. Annual Enrollment Size by Area



Highest Degree Offered

Schools that offer a bachelor's degree as their highest degree have a fifty percent participation rate of including sustainability in academics, research and leadership. All of the schools in this group include sustainability in their operations.

Seventy-six percent of institutions of higher education that offer a master's degree as their highest degree include sustainability in academics. Fifty-two percent of these schools engage in research related to sustainability. They include sustainability in their operations at fifty-seven percent of the schools. The lowest performing area is leadership at twenty-nine percent.

There was one post-master's certificate school in the sample population. They include sustainability in academics, research and operations. They were lacking in leadership around sustainability.

Institutions that offer a Doctoral degree as their highest degree offered performed better than schools that offer bachelor's or master's degrees. Eighty-four percent of these schools offer academics around sustainability. Seventy-six percent of these schools engage in research around sustainability. This group scored highest in operations with a participation rate of eighty-five percent. They scored lowest in leadership at a fifty-two percent participation rate.

Table 73. Highest Degree Offered Overview

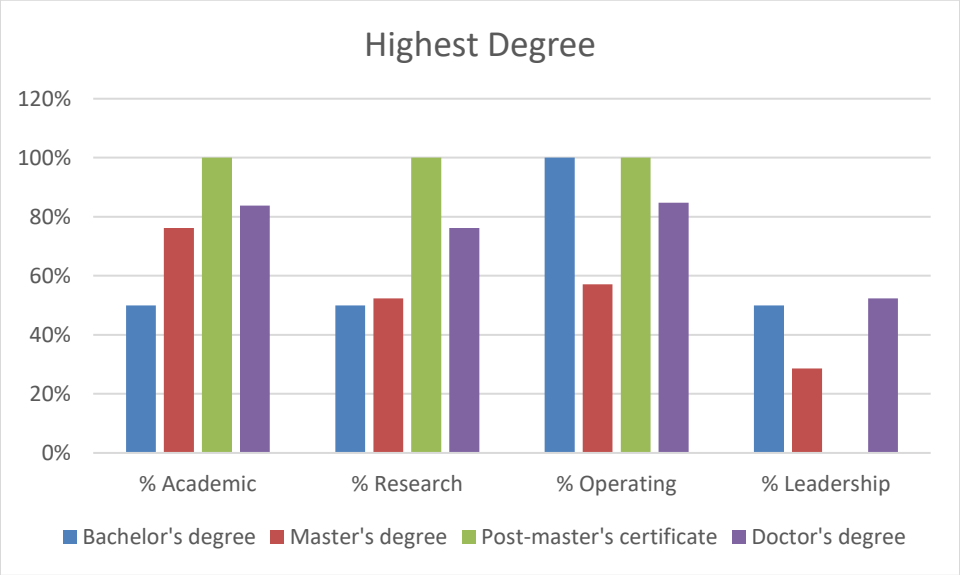
Academics	Operating	Research	Leadership	No.	% Category
Bachelor's degree					
No	Yes	No	No	1	25%
No	Yes	Yes	No	1	25%
Yes	Yes	No	Yes	1	25%
Yes	Yes	Yes	Yes	1	25%
Master's degree					
No	No	No	No	4	19%
No	Yes	No	No	1	5%
Yes	No	No	No	2	10%
Yes	No	Yes	No	2	10%
Yes	No	Yes	Yes	1	5%
Yes	Yes	No	No	2	10%
Yes	Yes	No	Yes	1	5%
Yes	Yes	Yes	No	4	19%
Yes	Yes	Yes	Yes	4	19%
Post-master's certificate					
Yes	Yes	Yes	No	1	100%
Doctor's degree					

No	No	No	No	6	6%
No	Yes	No	No	1	1%
No	Yes	No	No	6	6%
No	Yes	No	Yes	3	3%
No	Yes	Yes	No	1	1%
Yes	No	No	No	4	4%
Yes	No	Yes	No	5	5%
Yes	No	Yes	Yes	1	1%
Yes	Yes	No	No	2	2%
Yes	Yes	No	Yes	3	3%
Yes	Yes	Yes	No	25	24%
Yes	Yes	Yes	Yes	48	46%

Table 74. Highest Degree Offered Percent by Area

Highest Degree Offered	% Academic	% Research	% Operating	% Leadership
Bachelor's degree	50%	50%	100%	50%
Master's degree	76%	52%	57%	29%
Post-master's certificate	100%	100%	100%	0%
Doctor's degree	84%	76%	85%	52%

Figure 12. Highest Degree Offered Percent by Area



Universities that use a whole institution approach incorporate sustainability in a holistic manner which encompasses leadership, academics, research and operations. Whole institution approaches view students as stakeholders who are empowered to transform their campus and make meaningful contributions. Holistic models require commitment from leadership to guide the institution and support change leaders. Cheeseman et al. performed a literature review in 2019 with a focus on sustainability policy in higher education. Those researchers thought additional efforts were needed at all levels of campus operations to improve sustainability efforts. This research supports the work of Cheeseman and others that there is work yet to be done.

The findings of this study show that higher education has incorporated environmental sustainability into academic programming at eighty-two percent of institutions. Environmental sustainability is part of the research performed at seventy-two percent of schools. Sustainability is integrated into the operations of eighty-one percent of institutions. The area that is lagging behind the others is leadership, where less than half of campuses have commitments to sustainability at the highest level. That means there continues to be a disconnect on college campuses among leadership, faculty, staff and students regarding the role of sustainability on campus.

A holistic approach to sustainability in institutions permeates the learning and teaching process while at the same time embedding sustainability across all aspects of operations, and leadership (UNESCO, 2014b). Management theory stresses leadership is necessary for any holistic model of change to be effective (Kohl, 2022, p. 227). A whole institution approach to sustainability requires visionary leaders who can develop new skills; this may slow down the needed cultural changes (Singer-Brodowski, M. et

al., 2019). This research shows that faculty are leading the change toward more sustainable campuses, but leadership is lacking.

Recommendations for future research include understanding leaderships view of a whole institution approach, researching why Florida outperformed other states, determining if EPSCoR states in other regions have similar patterns, and determining if there are key student demographics related to a culture of sustainability at institutions of higher education.

References

Aceves-Avila, C.D., Berger-García, M.A. (2019). Sustainable Facilities Management in Higher Education Institutions. In: Leal Filho, W. (eds) Encyclopedia of Sustainability in Higher Education. Springer, Cham. https://doi.org/10.1007/978-3-319-63951-2_280-1

Amador, F., Martinho, A. P., Bacelar-Nicolau, P., Caeiro, S., & Oliveira, C. P. (2015). Education for sustainable development in higher education: evaluating coherence between theory and praxis. *Assessment & Evaluation in Higher Education*, *40*(6), 867–882. https://doi-org.uno.idm.oclc.org/10.1080/02602938.2015.1054783

American Society of Landscape Architects (2021). The Sustainable Sites Initiative (SITES). Retrieved from: https://www.asla.org/sites/

Anderson, D., & Slade, C. (2016). Managing Institutional Research Advancement: Implications from a University Faculty Time Allocation Study. *Research in Higher Education*, *57*(1), 99–121. https://doi.org/10.1007/s11162-015-9376-9

Association for the Advancement of Sustainability in Higher Education (AASHE) (2021). The Sustainability Tracking, Assessment & Rating System. *Association for the Advancement of Sustainability in Higher Education.* Retrieved from: https://stars.aashe.org/

Association of Public & Land-Grant Universities. *Why Public Urban Research Universities?* Retrieved August 23, 2023 from: https://www.aplu.org/urban-serving-universities/why/

Association of University Leaders for a Sustainable Future (ULSF) (2015). Sustainability Assessment Questionnaire. Association of University Leaders for a Sustainable Future. http://ulsf.org/sustainability-assessment-questionnaire/

Bauer M, Rieckmann M, Niedlich S and Bormann I (2021) Sustainability Governance at Higher Education Institutions: Equipped to Transform? *Front. Sustain.* 2:640458. doi: 10.3389/frsus.2021.640458

Beringer, A., Adombent, M. Sustainable University Research and Development: Inspecting Sustainability in Higher Education Research. *Environmental Education Research*. 2008;14(6):607-623. doi:10.1080/13504620802464866

Bickell, E.G. (2022). "The U.S. Land-Grant University System: Overview and Role in Agricultural Research." *Congressional Research Service*. R45897. Retrieved from: https://crsreports.congress.gov

Biting, J. and Kloss, C. (2008). Managing Wet Weather with Green Infrastructure Municipal Handbook: Green Infrastructure Retrofit Policies. Environmental Protection Agency Publication: EPA-833-F-08-008. Retrieved from https://www.epa.gov/sites/production/files/2015-10/documents/gi_munichandbook_retrofits.pdf

Boyd, L. (2001). Buffer Zones and Beyond: Wildlife use of Wetland Buffer Zones and their Protection under the Massachusetts Wetland Protection Act. Retrieved from:https://dec.vermont.gov/sites/dec/files/wsm/wetlands/docs/Wetland_buffer_zones_and_Beyond.pdf

Calder, W. & Clugston, R. (2003). International Efforts to Promote Higher Education for Sustainable Development. *Planning for Higher Education*. March-May 2003 (31). pp. 34-48.

Calder, W. and Dautremont-Smith, J (2009). Higher Education: More and More Laboratories for Inventing a Sustainable Future. *Agenda for a Sustainable America* Ch 7. pp. 93-107. *Environmental Law Institute*, 2009.

Carleton, D. (2002). "The Smith–Hughes Act (February 23, 1917)". Landmark Congressional Laws on Education. Greenwood Publishing Group. pp. 63–76. ISBN 978-0-313-31335-6.

Cheeseman, A., Sharon Alexandra Wright, T., Murray, J., & McKenzie, M. (2019). Taking stock of sustainability in higher education: a review of the policy literature. *Environmental Education Research, 25*, 1697 - 1712.

Creswell, J. and Creswell, J (2018). Research Design: Qualitative, Quantitative and Mixed Methods Approaches (5th edition). Sage Publishing.

Croft, G. (2019). The U.S. Land-Grant University System: An Overview. *Congressional Research Service*. R45897.

Croft, G. (2022). The U.S. Land-Grant University System: Overview and Role in Agricultural Research. *Congressional Research Office*. R45897 Retrieved from: https://www.researchgate.net/publication/363659140

Delmas, M. A., & Burbano, V. C. (2011). The Drivers of Greenwashing. *California Management Review*, *54*(1), 64–87. https://doi-org.uno.idm.oclc.org/10.1525/cmr.2011.54.1.64

Derqui, B., Grimaldi, D., & Fernandez, V. (2020). Building and managing sustainable schools: The case of food waste. *Journal of Cleaner Production*, Volume 243

Diner, S. J. (2013). The Land-Grant Analogy and the American Urban University: An Historical Analysis. *Metropolitan Universities*, *23*(3), 61–77. https://doi.org/https://www.cumuonline.org/muj.aspx

Environmental Protection Agency (EPA). What is green infrastructure? Accessed 12/30/2022 https://www.epa.gov/green-infrastructure/what-green-infrastructure

EPSCoR/IDeA Foundation (2021). Retrieved from: https://www.epscorideafoundation.org/about/epscor-idea-mission

Extension Foundation. Retrieved from: https://extension.org/

Ferrer-Balas, D., Adachi, J., Banas, S., Davidson, C.I., Hoshikoshi, A., Mishra, A., Motodoa, Y., Onga, M. and Ostwald, M. (2008), "An international comparative analysis of sustainability transformation across seven universities", *International Journal of Sustainability in Higher Education*, Vol. 9 No. 3, pp. 295-316. doi.org/10.1108/14676370810885907

Fox, J, et al (2017). A National Framework for Urban Extension. *Journal of Extension*. October 2017, Vol. 55, # 5, Article #5FEA2 p 1-10.

Frantzeskaki, Niki. "Seven lessons for planning nature-based solutions in cities." *Environmental science & policy* 93 (2019): 101-111.

Gadd, M., (2015) The Smith-Hughes Act of 1917. Texas FFA Association. *Texas FFA News*. Retrieved from: https://www.texasffa.org/news/The-SmithHughes-Act-of-1917

Garrison, N. and Hobbs, K. (2011). Rooftops to Rivers II: Green strategies for controlling stormwater and combined sewer overflows. Washington, D.C.: Natural Resources Defense Council.

Gillihan, Seth J. (2019). 10 Mental Health Benefits of Gardening. Retrieved from: https://www.psychologytoday.com/us/blog/think-act-be/201906/10-mental-health-benefits-gardening

Gleason R., Kirillov P. N., Koryakina N. I., Ermakov A. S., Ermakov D. S. Whole-institution approach in education for sustainable development: theory and practice // *Scholarly Notes of Transbaikal State University*. 2020. Vol. 15, No. 4. PP. 36–43. DOI: 10.21209/2658-7114-2020-15-4-36-43

Green Infrastructure Center (2018). Our Mission. Retrieved from http://www.gicinc.org./

Gwilliam, J., Reeves, A., & Timus, N. (2023). *Journal of Integrative Environmental Sciences* 2023, VOL. 20, NO. 1, 2250420 https://doi.org/10.1080/1943815X.2023.2250420

Hargreaves, LG (2008) 'The whole-school approach to education for sustainable development: From pilot projects to systemic change', Policy and Practice: A Development Education Review, Vol. 6, Spring, pp. 69-74.

Higgs, A.L. and McMillan, V. M. (2006). Teaching Through Modeling: Four Schools' Experiences in Sustainability Education. *Journal of Environmental Education*, *38*(1), 39–53. https://doi-org.uno.idm.oclc.org/10.3200/JOEE.38.1.39-53

Higher education research and development survey. (n.d.). National Center for Science and Engineering Statistics. Retrieved from: https://ncsesdata.nsf.gov/builder/herd

Hooey, C., Mason, A., & Triplett, J. (2017). Beyond Greening: Challenges to Adopting Sustainability in Institutions of Higher Education. *Midwest Quarterly*, *58*(3), 280–291.

Hoover, E., and Harder, M. K. (2015). What lies beneath the surface? The hidden complexities of organizational change for sustainability in higher education. *Journal of Cleaner Production.* 106, 175–188. doi: 10.1007/978-3-319-63007-6_33

Kahn, S. (2020). Women With Access to Higher Education Changed America—But Now They're Bearing the Brunt of the Student Debt Crisis. *Time*. Retrieved from: https://time.com/5797922/women-higher-education-history/

Kanchanapibul, M., Lacka, E., Wang, X., & Chan, H. K. (2014). An empirical investigation of green purchase behaviour among the young generation. *Journal of Cleaner Production*, *66*, 528-536.

Kecskes, K., Joyalle, J., Elliott, E., & Sherman, J. D. B. (2017). Sustainability of Our Planet and All Species as the Organizing Principle for SLCE. *Michigan Journal of Community Service Learning*, 23(2), 159–164.

Kemp, N. and Scoffham, S. (2021), "The paradox model: towards a conceptual framework for engaging with sustainability in higher education", *International Journal of Sustainability in Higher Education*, Vol. ahead-of-print No. ahead-of print. https://doi.org/10.1108/IJSHE-08-2020-0311

Kohl, K., et al. (2022). A whole-institution approach to sustainability: a crucial aspect of higher education's individual and collective engagement with the SDGs and beyond. *International Journal of Sustainability in Higher Education.* Vol. 23 No. 2,

pp. 218-236. Emerald Publishing Limited 1467-6370 DOI http://dx.doi.org/10.1108/IJSHE-10-2020-0398

Kolb, A. Y., & Kolb, D. A. (2017). Experiential Learning Theory as a Guide for Experiential Educators in Higher Education. *Experiential Learning & Teaching in Higher Education (ELTHE): A Journal for Engaged Educators*, *1*(1), 7–44

Kong, Y. (2021). The Role of Experiential Learning on Students' Motivation and Classroom Engagement. *Frontiers in Psychology*, 12:771272. https://doi.org/10.3389/fpsyg.2021.771272

Kopcha, T., & Sullivan, H. (2007). Self-presentation bias in surveys of teachers' educational technology practices. *Educational Technology Research & Development*, *55*(6), 627–646. https://doi-org.uno.idm.oclc.org/10.1007/s11423-006-9011-8

Larrán, M., Herrera, J., & Andrades, F. J. (2016). Measuring the linkage between strategies on sustainability and institutional forces: an empirical study of Spanish universities. *Journal of Environmental Planning & Management*, 59(6), 967–992.

Lee, B. A. (2010). Fifty Years of Higher Education Law: Turning the Kaleidoscope. *Journal of College & University Law*, *36*(3), 649–690.

Leech, N. L., Haug, C. A., Iceman-Sands, D., & Moriarty, J. (2015). Change in classification level and the effects on research productivity and merit scores for faculty in a school of education. *Studies in Higher Education*, *40*(6), 1030–1045. https://doi.org/10.1080/03075079.2014.881341

Lindemann, J., Alter, T. R., Stagner, F., Palacios, E., Banuna, L., & Muldoon, M. (2022). Building urban community resilience through university extension: community

engagement and the politics of knowledge. *Socio-Ecological Practice Research*, *4*(4), 325–337. https://doi.org/10.1007/s42532-022-00126-6

Louisiana Native Plant Society. Retrieved from: https://www.lnps.org/home

Lovell, S. T., & Taylor, J. R. (2013). Supplying urban ecosystem services through multifunctional green infrastructure in the United States. *Landscape ecology*, 28(8), 1447-1463.

Maddox, P., Doran, C., Williams, I. D., & Kus, M. (2011). The role of intergenerational influence in waste education programmes: The THAW project. *Waste Management*, *31*(12), 2590–2600. https://doi-org.uno.idm.oclc.org/10.1016/j.wasman.2011.07.023

McIntosh, M., K. Cacciola, et al. (2001). State of the campus environment: A national report card on environmental performance and sustainability in higher education. Reston, VA, National Wildlife Federation

McKeown, R., Hopkins, C., Chrystalbridge, M. Education for Sustainable Development in Action, Learning & Training Tools N°1, October 2006

McLeod, S. (2024). Kolb's Learning Styles and Experiential Learning Cycle. Simply Psychology. Retrieved from: https://www.simplypsychology.org/learning-kolb.html#

Michel, J. O., & Zwickle, A. (2021). The effect of information source on higher education students' sustainability knowledge. *Environmental Education Research*, *27*(7), 1080–1098. https://doi-org.uno.idm.oclc.org/10.1080/13504622.2021.1897527

Moscardini, A. O., Strachan, R., & Vlasova, T. (2022). The Role of Universities in Modern Society. *Studies in Higher Education*, *47*(4), 812–830. https://doi-org.uno.idm.oclc.org/10.1080/03075079.2020.1807493

National Aeronautics and Space Administration. About the Space Grant Project. Retrieved August 1, 2023 from: https://www.nasa.gov/learning-resources/national-space-grant-college-and-fellowship-project/about-the-space-grant-project/

National Institute of Food and Agriculture. (2023) Capacity Grants: The Hatch Act of 1887. Retrieved from: https://www.nifa.usda.gov/grants/programs/capacity-grants/hatch-act-1887

National Park Service. Green Roofs on Historic Buildings: Green Roof Benefits. Accessed: December 30, 2023 https://www.nps.gov/articles/000/green-roofs-on-historic-buildings-green-roof-benefits.htm

National Research Council. 1995. *Colleges of Agriculture at the Land Grant Universities: A Profile*. Washington, DC: The National Academies Press. https://doi.org/10.17226/4980.

Navajo Technical University (2024). Doctor of Philosophy, Diné Culture and Language Sustainability. Retrieved from: http://www.navajotech.edu/academics/doctor-of-philosophy/dine-culture-and-language-sustainability.

Office of Urban Extension and Engagement. Rutgers University. Retrieved from: https://urbanextension.rutgers.edu/

Onga, M. and Ostwald, M. (2008), "An international comparative analysis of sustainability transformation across seven universities", International Journal of

Sustainability in Higher Education, Vol. 9 No. 3, pp. 295-316. doi.org/10.1108/14676370810885907

Palma, L. C., & Pedrozo, E. Á. (2015). Complex matrix for the analysis of sustainable transformative learning: an assessment methodology of sustainability integration in universities. *Assessment & Evaluation in Higher Education*, *40*(6), 817–832. https://doi-org.uno.idm.oclc.org/10.1080/02602938.2015.1040371

Parikh, T., et al. (2022). Greening the Virtual Smart City: Accelerating Peer-to-Peer Learning in Urban Agriculture With Virtual Reality Environments. *Frontiers in Sustainable Cities*, *3*. https://doi.org/10.3389/frsc.2021.815937

Peshek, S. (2018). The Morrill Act, Explained. *Why is the Morrill Act still important to Texas A&M and the dozens of other public universities it helped create more than 150 years after its passage?* Retrieved from: The Morrill Act, Explained - Texas A&M Today (tamu.edu)

Reynolds, T. S. (1992). The Education of Engineers in America before the Morrill Act of 1862. *History of Education Quarterly*, *32*(4), 459–482. https://doi.org/10.2307/368959

Roos, N. and Guenther, E. (2020), "Sustainability management control systems in higher education institutions from measurement to management", *International Journal of Sustainability in Higher Education*, Vol. 21 No. 1, pp. 144-160. https://doi.org/10.1108/IJSHE-01-2019-0030

Rotman, R.M., Gossett, C.J., & Goldman, H.D. (2020). Greenwashing No More: The Case for Stronger Regulation of Environmental Marketing. *Administrative Law Review*, *72*(3), 417–443.

Rusinko, C.A. (2005). Using Quality Management as a Bridge to Environmental Sustainability in Organizations. SAM Advanced Management Journal, January 2005.

Ryan, R. Green Infrastructure Planning on Campus: Case Studies from University of Massachusetts-Amherst. *Journal of Green Building* 1 June 2018; 13 (3): 145–157.

Sari, M., Faisal, F. & Harto, P. (2023) The determinants of higher education institutions' (HEIs) sustainability reporting, Cogent Business & Management, 10:3, 2286668, DOI: 10.1080/23311975.2023.2286668

Sánchez, R.G., Bolívar, M. P., & López-Hernández, A. M. (2013). Online disclosure of university social responsibility: a comparative study of public and private US universities. Environmental Education Research, 19(6), 709–746. https://doi-org.uno.idm.oclc.org/10.1080/13504622.2012.749976

Sea Grant. *About Sea Grant: Providing research for resilient communities*. Accessed December 20, 2023: https://seagrant.noaa.gov/about-sea-grant/

Shi L, Han L, Yang F, Gao L. The Evolution of Sustainable Development Theory: Types, Goals, and Research Prospects. *Sustainability*. 2019; 11(24):7158. https://doi.org/10.3390/su11247158

Singer-Brodowski, M., Etzkorn, N., and von Seggern, J. (2019). One transformation path does not fit all – insights into the diffusion processes of education for sustainable development in different educational areas in Germany. Sustainability 11:269. doi.org/10.3390/su11010269

Spicer, E. M. (n.d.). *What is an Urban University?* Retrieved from: https://search-ebscohost-com.uno.idm.oclc.org/login.aspx?direct=true&db=eric&AN=ED114039&site=eds-live&scope=site

Stafford, S. L. (2011). How Green Is Your Campus? An Analysis of the Factors That Drive Universities to Embrace Sustainability. Contemporary Economic Policy, 29(3), 337–356.

Sugiarto, A., Lee, C. W., & Huruta, A. D. (2022). A Systematic Review of the Sustainable Campus Concept. *Behavioral sciences (Basel, Switzerland)*, *12*(5), 130. https://doi.org/10.3390/bs12050130

Sustainable Endowments Institute (2012). Sustainability Report Card – A Review of Campus & Endowment Policies at Leading Institutions. Retrieved from: http://greenreportcard.org/index.html

Tiffany, J. (2017). Extension in the City: Meeting the Challenges of Scale. Journal of Human Sciences and Extension, 5(2), 37–54. https://doi-org.uno.idm.oclc.org/10.54718/GOBB7339

Trechsel, L.J., Diebold, C.L., Zimmermann, A.B. and Fischer, M. (2023), "Students between science and society: why students' learning experiences in transformative spaces are vital to higher education institutions", *International Journal of Sustainability in Higher Education*, Vol. 24 No. 9, pp. 85-101. https://doi.org/10.1108/IJSHE-09-2021-0407

Tumbas, P. et al (2015). Sustainable University: Assessment Tools, Factors, Measures and Model. Conference: 7th International Conference on Education and New

Learning Technologies (EDULEARN 2015) At: Barcelona – Spain. Retrieved from: https://www.researchgate.net/publication/280092859

Tyler, J. (2016). Sustainable Hazard Mitigation: Exploring the Importance of Green Infrastructure in Building Disaster Resilient Communities. *Consilience*, *15*, 134–145. http://www.jstor.org/stable/26188762

United States. Act of July 2, 1862 (Morrill Act), Public Law 37-108, which established land grant colleges, 07/02/1862; Enrolled Acts and Resolutions of Congress, 1789-1996; Record Group 11; General Records of the United States Government; National Archives.

United States. Agricultural College Act of 1890 (Second Morrill Act), Aug. 30, 1890, Ch. 841, 26 Stat. 417 (7 U.S.C. 321 et seq.) Retrieved from: https://uscode.house.gov/view.xhtml?req=granuleid:USC-prelim-title7-section321&num=0&edition=prelim

United States. Agriculture Extension Act (Smith-Lever Act of 1914), Public Law 63-95, AN ACT To provide for cooperative agricultural extension work between the agricultural colleges in the several States receiving the benefits of an Act of Congress approved July second, eighteen hundred and sixty-two, and of Acts supplementary thereto, and the United States Department of Agriculture. May 8, 1914 372. Retrieved from: https://govtrackus.s3.amazonaws.com/legislink/pdf/stat/38/STATUTE-38-Pg372a.pdf

United States. Celebrating the 150th anniversary of the signing of the First Morrill Act (2012). S.Res. 502. Retrieved from: https://www.congress.gov/112/bills/sres502/BILLS-112sres502ats.pdf

United States. Department of Education, 2023 Secretaries of Education, Agriculture Call on Governors to Equitably Fund Land-Grant HBCUs | U.S. Department of Education. Retrieved from: https://www.ed.gov/news/press-releases/secretaries-education-agriculture-call-governors-equitably-fund-land-grant-hbcus

United States. Department of Education - National Center for Education Statistics (NCES). Integrated Postsecondary Education Data System (IPEDS). Retrieved from: https://nces.ed.gov/ipeds/use-the-data/download-access-database

United States. Department of Education – White House Initiative on Advancing Educational Equity, Excellence, and Economic Opportunity for Native Americans and Strengthening Tribal Colleges and Universities: Tribal Colleges and Universities. Retrieved December 28, 2023 from: https://sites.ed.gov/whiaiane/tribes-tcus/tribal-colleges-and-universities/

United States. Environmental Protection Agency. Building the Case for Green Infrastructure: Outreach and Education (2016). Retrieved from: https://www.epa.gov/green-infrastructure/building-case-green-infrastructure-outreach-and-education

United States. Environmental Protection Agency, Office of Research and Development. Healthy Benefits of Green Infrastructure in Communities (2017). Retrieved from https://www.epa.gov/sites/production/files/2017-11/documents/greeninfrastructure_healthy_communities_factsheet.pdf

Unites States. Equity in Educational Land-Grant Status Act of 1994. (Improving America's Schools Act of 1994). Pub. L. 103-382, title V, part C (Sec. 531 et seq.), Oct. 20, 1994, 108 Stat. 4048 (7 U.S.C. 301 note). Retrieved from: https://www.congress.gov/103/statute/STATUTE-108/STATUTE-108-Pg3518.pdf

United States. National Sea Grant College and program Act of 1966. Public Law 89–688, Approved Oct. 15, 1966, 80 Stat. 998. Retrieved from: https://www.govinfo.gov/content/pkg/COMPS-1685/pdf/COMPS-1685.pdf

United States. National Space Grant College and Fellowship Act. (National Aeronautics and Space Administration Authorization Act of 1988). Public Law 100-147, Approved Oct. 30, 1987. Retrieved from: https://uscode.house.gov/statutes/pl/100/147.pdf

United States. National Science Foundation - National Center for Science and Engineering Statistics (2023). Higher Education Research and Development (HERD) Survey. Retrieved from: https://ncses.nsf.gov/surveys/higher-education-research-development/2022

United States. Ordinance for the Government of the Territory of the United States North-West of the River Ohio; 7/13/1787; Miscellaneous Papers of the Continental Congress, 1774 - 1789; Records of the Continental and Confederation Congresses and the Constitutional Convention, Record Group 360; National Archives Building, Washington, DC.

United States. Water Infrastructure Improvement Act. Public Law 115-436-Jan. 14, 2019. Retrieved from: https://www.congress.gov/115/plaws/publ436/PLAW-115publ436.pdf

UNESCO (2018), “UNESCO Global Action Programme on Education for Sustainable Development.” Retrieved from: https://www.unesco.org/en/sustainable-development/education

UNESCO (2014b), “Shaping the Future we want. UN Decade of Education for Sustainable Development (2005-2014). Final Report,” UNESCO, Paris, available at: https://unesdoc.unesco.org/ark:/48223/pf0000230171

Wals, A. E. J., Tassone, V. C., Hampson, G. P., and Reams, J. (2016). “Learning for walking the change: eco-social innovation through sustainability-oriented higher education,” in *Routledge Handbook of Higher Education for Sustainable Development*, eds M. Barth, G. Michelsen, M. Rieckmann, and I. Thomas (London: Routledge), 25–39.

Weiss, E. (1990). Our Rights and Obligations to Future Generations for the Environment. The American Journal of International Law, 84(1), 198-207.

Whitman, S. and Eisenhauer, B. *(August/September 2020)* . *Planning* 86(8), pp. 26-31.

World Commission on Environment and Development. 1987. *Our Common Future.* Oxford: Oxford University Press.

Wright, Tarah (2003). “A Tenth Year Anniversary Retrospect: The Effect of the Halifax Declaration on Canadian Signatory Universities” Canadian Journal of Environmental Education, 8, Spring 2003, pp. 233-248.

Zhang, .,Z Zhou, J., Schmidt, D., & Garland, K. (2016). Sustainable Campus Landscapes in the United States and China: A Comparative Analysis. Geographical Bulletin, 57(1), 41–61.

Appendix A

Institutional Review Board Approval Letter

THE UNIVERSITY of NEW ORLEANS

INSTITUTIONAL REVIEW BOARD

Memorandum

Principal Investigator:	Bethany Marie Stich
Co-Principal Investigator:	Carol Lunn
Date:	February 1, 2024
Protocol Title:	Environmental Sustainability in Universities of the Gulf South
IRB Number:	02Feb24

The Institutional Review Board for the Protection of Human Subjects in Research (IRB) has deemed that the research and procedures of the above-named protocol are compliant with the University of New Orleans and federal guidelines and meet the standard for expedited IRB review according to:

A. Research activities that (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the following categories, may be reviewed by the IRB through the expedited review procedure authorized by 45 CFR 46.110 and 21 CFR 56.110. […]

6. Collection of data from voice, video, digital, or image recordings made for research purposes.

7. Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Review of the submitted protocol indicated that all procedures are in compliance with 45 CFR 46. Any changes to the procedures must be reviewed and approved by the IRB prior to implementation. All approvals are valid for one year and can be renewed upon request.

I wish you much success with your research project. If you have any questions, please do not hesitate to contact me at 280-7481.

Sincerely,

Roberto Refinetti

Roberto Refinetti, PhD
IRB Chair

Appendix B

Survey Instrument – President/Chancellor

Environmental Sustainability in Universities of the Gulf South: President/Chancellor Survey

Survey Flow

Standard: Block 1 (2 Questions)
Block: Default Question Block (26 Questions)

EndSurvey: Advanced

Page Break

Start of Block: Block 1

Environmental Sustainability in Universities of the Gulf South

Survey: President, Chancellor, Chief Executive Officer

Human Subject Consent Form

This is a summary of a survey you are asked to participate in. Please read this information prior to signing the statement below.

Title of Study: Environmental Sustainability in Universities of the Gulf South

Purpose of Study: The purpose of this study is to determine the sustainability practices in universities of the gulf south, to determine if universities with a higher level of research productivity have a higher level of environmental sustainability, and to

determine if certain types of universities are more likely to incorporate environmental sustainability practices.

Subjects of Study: Universities in the Gulf South, who reported research expenditures in the Higher Education Research and Development Survey (HERD) between 2013 and 2022, were selected to participate in this survey.

Procedures of Study: In this research, you will answer a series of questions related to environmental sustainability practices on your campus. You will also answer basic questions regarding your institution. Surveys will be assigned a number and the deidentified survey results will be stored on a password protected laptop. You may change your answers at any time prior to submitting the survey. This survey will be sent once a week, or until you complete the survey, for up to three weeks.

Time Expectations: It is estimated that this study may take approximately 15-30 minutes. If allocating 15-30 minutes is challenging, you do not have to complete the survey in a single setting. You can come back to the survey by following the link in the invitation email.

Benefits: Participants will not be compensated for completing the survey but may potentially benefit from the outcomes of the study.

Risks: Your participation in this survey is voluntary. The survey will be conducted electronically, so there should be no physical risk. The results of the research will be published, but your name will not be used. Confidentiality and anonymity are potential

risks that will be mitigated based on the procedures section above. If you choose not to participate, or to withdraw from the study at any time, there will be no penalty.

Contacts: Questions regarding the research, subjects' rights and other matters may be sent to these contacts.

Doctoral Student: Carol Lunn (clunn1@uno.edu)

Dissertation Chair: Bethany Stich (bstich@uno.edu)

IRB Chair Roberto Refinetti (unoirb@uno.edu or 504-280-7481)

If you agree to take part in this study, then you agree to the following: I have read and understand the description of the study. My participation is voluntary and my participation, or refusal to participate, will not impact my relationship with the University of New Orleans. I understand that I may withdraw from the study at any time.

Thank you for your time and consideration.

Do you agree to participate in this study? (If no, the survey will close when you hit next. If yes, the survey will continue.)

- ○ Yes (1)
- ○ No (2)

Skip To: End of Survey If QID23 = 2

End of Block: Block 1

Start of Block: Default Question Block

General Questions

Q1 What is the name of your institution?

_____

Q2 What is the title of the person completing the survey?

_____

Q3 What is the name of the person completing the survey?

_____

University Commitment, Budget, and Communication

Q4 Does your institution have a written commitment to environmental sustainability in your mission statement, vision statement or institutional effectiveness program?

- Yes (1)
- No (2)

Q5 Does your institution have a written commitment to include environmental sustainability in your academic mission?

- Yes (1)
- No (2)

Q6 Does your campus offer an orientation session about environmental sustainability initiatives to students, faculty or staff?

- Yes (1)
- No (2)

Q7 Does your campus have a structured framework and clear expectations for the campus operations to increase environmental sustainability?

- Yes (1)
- No (2)

Q8 Has your campus signed a sustainability agreement or declaration (i.e. Talloires Declaration, or The American College & University President's Climate Commitment)?

- Yes (1)
- No (2)

Q9 Has your campus used a sustainability assessment tool to evaluate environmental sustainability efforts (i.e. National Wildlife Federation: State of the Campus Environment Survey, University Leaders for a Sustainable Future: Sustainability Assessment Questionnaire for Colleges and Universities, or The Association for the Advancement of Sustainability in Higher Education: The Sustainability Tracking, Assessment and Rating System (STARS))?

- Yes (1)
- No (2)

Q10 Does your campus have a full-time paid position to lead environmental sustainability issues?

- ○ Yes (1)
- ○ No (2)

Q11 If your campus has a full-time paid position to lead environmental sustainability issues, where do they report?

- ○ Central administration (1)
- ○ Facilities, Physical Plant, Operations department (2)
- ○ Academic Dean of College (3)
- ○ Board of Trustees (4)
- ○ Other position or department (specify) (5) _____
- ○ Not applicable (6)

Q12 Does your campus have an environmental sustainability task force, committee, or council?

- ○ Yes (1)
- ○ No (2)

Q13 Does your institution have a dedicated green fee to fund sustainability efforts?

- ○ Yes (1)
- ○ No (2)

Education, Engagement, and Outreach

Q14 Are students at your institution required to take a course on environmental sustainability topics or issues (select all that apply)?

- ☐ Yes – all undergraduate students are required to take a course (1)
- ☐ Yes – some undergraduate students are required to take a course (2)
- ☐ Yes – all graduate students are required to take a course (3)
- ☐ Yes – some graduate students are required to take a course (4)
- ☐ No students are required (5)

Q15 For undergraduate students, do you offer (select all that apply)?

- [ ] A major in environmental studies (1)
- [ ] A minor in environmental studies (2)
- [ ] A certificate in environmental studies (3)
- [ ] Service learning opportunities related to environmental sustainability (4)
- [ ] Student projects on campus related to environmental sustainability (5)
- [ ] None of the above (6)

Q16 For graduate students, do you offer (select all that apply)?

- [ ] A major in environmental studies (1)
- [ ] A minor in environmental studies (2)
- [ ] A certificate in environmental studies (3)
- [ ] Service learning opportunities related to environmental sustainability (4)
- [ ] Student projects on campus related to environmental sustainability (5)
- [ ] None of the above (6)

Q17 Do sustainability efforts at your campus enhance your community engagement and outreach?

- ○ Yes (1)
- ○ No (2)

Research

Q18 Are you aware of research funding related to environmental sustainability on your campus?

- ○ Yes (1)
- ○ No (2)

Q19 Does your institution have research centers or institutes focused on environmental sustainability?

- ○ Yes (1)
- ○ No (2)

Q20 Does your institution have large interdisciplinary grants related to environmental sustainability?

- ○ Yes (1)
- ○ No (2)

Open-Ended

Q21 Is there anything you would like to add to this survey which was not addressed in the questions?

_____

_____

_____

_____

_____

End of Block: Default Question Block

Appendix C

Survey Instrument – Operations and Administration

Environmental Sustainability in Universities of the Gulf South: Operations and Administration

Survey Flow

Standard: Block 1 (2 Questions)
Block: Default Question Block (16 Questions)

EndSurvey: Advanced

Page Break

Start of Block: Block 1

Environmental Sustainability in Universities of the Gulf South

Survey: Business Affairs, Operations, and Administration

Human Subject Consent Form

This is a summary of a survey you are asked to participate in. Please read this information prior to signing the statement below.

Title of Study: Environmental Sustainability in Universities of the Gulf South

Purpose of Study: The purpose of this study is to determine the sustainability practices in universities of the gulf south, to determine if universities with a higher level of research productivity have a higher level of environmental sustainability, and to

determine if certain types of universities are more likely to incorporate environmental sustainability practices.

Subjects of Study: Universities in the Gulf South, who reported research expenditures in the Higher Education Research and Development Survey (HERD) between 2013 and 2022, were selected to participate in this survey.

Procedures of Study: In this research, you will answer a series of questions related to environmental sustainability practices on your campus. You will also answer basic questions regarding your institution. Surveys will be assigned a number and the deidentified survey results will be stored on a password protected laptop. You may change your answers at any time prior to submitting the survey. This survey will be sent once a week, or until you complete the survey, for up to three weeks.

Time Expectations: It is estimated that this study may take approximately 15-30 minutes. If allocating 15-30 minutes is challenging, you do not have to complete the survey in a single setting. You can come back to the survey by following the link in the invitation email.

Benefits: Participants will not be compensated for completing the survey, but may potentially benefit from the outcomes of the study.

Risks: Your participation in this survey is voluntary. The survey will be conducted electronically, so there should be no physical risk. The results of the research will be published, but your name will not be used. Confidentiality and anonymity are potential

risks that will be mitigated based on the procedures section above. If you choose not to participate, or to withdraw from the study at any time, there will be no penalty.

Contacts: Questions regarding the research, subjects' rights and other matters may be sent to these contacts.

Doctoral Student: Carol Lunn (clunn1@uno.edu)

Dissertation Chair: Bethany Stich (bstich@uno.edu)

IRB Chair Roberto Refinetti (unoirb@uno.edu or 504-280-7481)

If you agree to take part in this study, then you agree to the following: I have read and understand the description of the study. My participation is voluntary and my participation, or refusal to participate, will not impact my relationship with the University of New Orleans. I understand that I may withdraw from the study at any time.

Thank you for your time and consideration.

Do you agree to participate in this study? (If no, the survey will close when you hit next. If yes, the survey will continue.)

- ○ Yes (1)
- ○ No (2)

Skip To: End of Survey If QID23 = 2

End of Block: Block 1

Start of Block: Default Question Block

General Questions

Q1 What is the name of your institution?

_____

Q2 What is the title of the person completing the survey?

_____

Q3 What is the name of the person completing the survey?

_____

Green Infrastructure

Q4 Does your campus include green infrastructure in campus operations (**select all that apply**)?

- [ ] Native plants are required in landscaping projects (1)
- [ ] The campus is taking steps to remove non-native plants (2)
- [ ] The campus has a tree maintenance plan (3)
- [ ] Bioswales, planter boxes or rain gardens (4)
- [ ] Buffer zones to protect wetlands, or other bodies of water near campus (5)
- [ ] Green parking (6)
- [ ] Green roofs and/or downspout disconnection (7)
- [ ] Green street, green alleys or permeable pavements (8)
- [ ] Rainwater harvesting (9)
- [ ] No green infrastructure projects are in place at this time (10)

Sustainable Operations

Does your campus include sustainability options in any of the operating services listed below (select all that apply)?

Q5 Recycling (select all that apply):

- [ ] Paper (1)
- [ ] Corrugated cardboard (2)
- [ ] Aluminum (3)
- [ ] Glass (4)
- [ ] Plastic (5)
- [ ] Electronics (6)
- [ ] No recycling is offered at this time (7)

Q6 Composting (select all that apply):

- [ ] Food scraps are composted (1)
- [ ] Landscape trimmings are composted (2)
- [ ] No composting is offered at this time (3)

Q7 Green purchasing requirements (select all that apply):

- ☐ Paper is minimum 25% standard post-consumer waste (1)
- ☐ Office paper is chlorine-free (2)
- ☐ Appliance purchases are energy efficient (3)
- ☐ A materials exchange or recovery program is in place (unused items are offered to other units on campus rather than disposing of) (4)
- ☐ No green purchasing requirements are in place at this time (5)

Q8 Buildings (select all that apply):

- ☐ The campus has one or more LEED certified green buildings (1)
- ☐ There are environmental performance requirements for new buildings (2)
- ☐ There are environmental performance requirements for updates of existing buildings (3)
- ☐ There is at least one building with a green roof (roof planted with vegetation) (4)
- ☐ No green building guides are in place at this time (5)

Q9 We have environmental sustainability requirements in operations that are were not listed in this survey (please provide a brief description).

_____

Q10 There are no written requirements for environmental sustainability in operations at this time

- ○ Yes (1)
- ○ No (2)

Open-Ended

Q11 Is there anything you would like to add to this survey which was not addressed in the questions?

_____

_____

_____

_____

_____

End of Block: Default Question Block

Appendix D

Survey Instrument – Provost

Environmental Sustainability in Universities of the Gulf South: Provost

Survey Flow

Standard: Block 1 (2 Questions)
Block: Default Question Block (36 Questions)

EndSurvey: Advanced

Page Break

Start of Block: Block 1

Environmental Sustainability in Universities of the Gulf South

Survey: Provost/Chief Academic Officer

Human Subject Consent Form

This is a summary of a survey you are asked to participate in. Please read this information prior to signing the statement below.

Title of Study: Environmental Sustainability in Universities of the Gulf South

Purpose of Study: The purpose of this study is to determine the sustainability practices in universities of the gulf south, to determine if universities with a higher level of research productivity have a higher level of environmental sustainability, and to

determine if certain types of universities are more likely to incorporate environmental sustainability practices.

Subjects of Study: Universities in the Gulf South, who reported research expenditures in the Higher Education Research and Development Survey (HERD) between 2013 and 2022, were selected to participate in this survey.

Procedures of Study: In this research, you will answer a series of questions related to environmental sustainability practices on your campus. You will also answer basic questions regarding your institution. Surveys will be assigned a number and the deidentified survey results will be stored on a password protected laptop. You may change your answers at any time prior to submitting the survey. This survey will be sent once a week, or until you complete the survey, for up to three weeks.

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Risks: Your participation in this survey is voluntary. The survey will be conducted electronically, so there should be no physical risk. The results of the research will be published, but your name will not be used. Confidentiality and anonymity are potential

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Dissertation Chair: Bethany Stich (bstich@uno.edu)

IRB Chair Roberto Refinetti (unoirb@uno.edu or 504-280-7481)

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Thank you for your time and consideration.

Do you agree to participate in this study? (If no, the survey will close when you hit next. If yes, the survey will continue.)

- ○ Yes (1)
- ○ No (2)

Skip To: End of Survey If QID23 = 2

End of Block: Block 1

Start of Block: Default Question Block

General Questions

Q1 What is the name of your institution?

_____

Q2 What is the title of the person completing the survey?

_____

Q3 What is the name of the person completing the survey?

_____

University Commitment, Budget, and Communication

Q4 Does your institution have a written commitment to environmental sustainability in your mission statement, vision statement or institutional effectiveness program?

- Yes (1)
- No (2)

Q5 Does your institution have a written commitment to include environmental sustainability in your academic mission?

- Yes (1)
- No (2)

Q6 Does your campus offer an orientation session about environmental sustainability initiatives to students, faculty or staff?

- ○ Yes (1)
- ○ No (2)

Q7 Does your campus have a structured framework and clear expectations for the campus operations to increase environmental sustainability?

- ○ Yes (1)
- ○ No (2)

Q8 Has your campus signed a sustainability agreement or declaration (i.e. Talloires Declaration, or The American College & University President's Climate Commitment)?

- ○ Yes (1)
- ○ No (2)

Q9 Has your campus used a sustainability assessment tool to evaluate environmental sustainability efforts (i.e. National Wildlife Federation: State of the Campus Environment Survey, University Leaders for a Sustainable Future: Sustainability Assessment Questionnaire for Colleges and Universities, or The Association for the Advancement of Sustainability in Higher Education: The Sustainability Tracking, Assessment and Rating System (STARS))?

- ○ Yes (1)
- ○ No (2)

Q10 Does your campus have a full-time paid position to lead environmental sustainability issues?

- ○ Yes (1)
- ○ No (2)

Q11 If your campus has a full-time paid position to lead environmental sustainability issues, where do they report?

- ○ Central administration (1)
- ○ Facilities, Physical Plant, Operations department (2)
- ○ Academic Dean of College (3)
- ○ Board of Trustees (4)
- ○ Other position or department (specify) (5) _____
- ○ Not applicable (6)

Q12 Does your campus have an environmental sustainability task force, committee, or council?

- ○ Yes (1)
- ○ No (2)

Q13 Does your institution have a dedicated green fee to fund sustainability efforts?

- ○ Yes (1)
- ○ No (2)

Education, Engagement, and Outreach

Q14 Are students at your institution required to take a course on environmental sustainability topics or issues (select all that apply)?

- ☐ Yes – all undergraduate students are required to take a course (1)
- ☐ Yes – some undergraduate students are required to take a course (2)
- ☐ Yes – all graduate students are required to take a course (3)
- ☐ Yes – some graduate students are required to take a course (4)
- ☐ No students are required (5)

Q15 For undergraduate students, do you offer (select all that apply)?

- [ ] A major in environmental studies (1)
- [ ] A minor in environmental studies (2)
- [ ] A certificate in environmental studies (3)
- [ ] Service learning opportunities related to environmental sustainability (4)
- [ ] Student projects on campus related to environmental sustainability (5)
- [ ] None of the above (6)

Q16 For graduate students, do you offer (select all that apply)?

- [ ] A major in environmental studies (1)
- [ ] A minor in environmental studies (2)
- [ ] A certificate in environmental studies (3)
- [ ] Service learning opportunities related to environmental sustainability (4)
- [ ] Student projects on campus related to environmental sustainability (5)
- [ ] None of the above (6)

Q17 Do sustainability efforts at your campus enhance your community engagement and outreach?

- ○ Yes (1)
- ○ No (2)

Research

Q18 Are you aware of research funding related to environmental sustainability on your campus?

- ○ Yes (1)
- ○ No (2)

Q19 Does your institution have research centers or institutes focused on environmental sustainability?

- ○ Yes (1)
- ○ No (2)

Q20 Does your institution have large interdisciplinary grants related to environmental sustainability?

- ○ Yes (1)
- ○ No (2)

Green Infrastructure

Q21 Does your campus include green infrastructure in campus operations (select all that apply)?

- [ ] Native Plants are required in landscaping projects (1)
- [ ] The campus is taking steps to remove non-native plants (2)
- [ ] The campus has a tree maintenance plan (3)
- [ ] Bioswales, planter boxes or rain gardens (4)
- [ ] Buffer zones to protect wetlands, or other bodies of water near campus (5)
- [ ] Green parking (6)
- [ ] Green roofs and/or downspout disconnection (7)
- [ ] Green street, green alleys or permeable pavements (8)
- [ ] Rainwater harvesting (9)
- [ ] No green infrastructure projects are in place at this time (10)

Sustainable Operations

Does your campus include sustainability options in any of the operating services listed below (select all that apply)?

Q22 Recycling

- [ ] Paper (1)
- [ ] Corrugated cardboard (2)
- [ ] Aluminum (3)
- [ ] Glass (4)
- [ ] Plastic (5)
- [ ] Electronics (6)
- [ ] No recycling is offered at this time (7)

Q23 Composting (select all that apply)

- [ ] Food scraps are composted (1)
- [ ] Landscape trimmings are composted (2)
- [ ] No composting is offered at this time (3)

Q24 Green purchasing requirements (select all that apply):

- ☐ Paper is minimum 25% standard post-consumer waste (1)
- ☐ Office paper is chlorine-free (2)
- ☐ Appliance purchases are energy efficient (3)
- ☐ A materials exchange or recovery program is in place (unused items are offered to other units on campus rather than disposing of) (11)
- ☐ No green purchasing requirements are in place at this time (12)

Q25 Buildings (select all that apply):

- ☐ The campus has one or more LEED certified green buildings (1)
- ☐ There are environmental performance requirements for new buildings (2)
- ☐ There are environmental performance requirements for updates of existing buildings (3)
- ☐ There is at least one building with a green roof (roof planted with vegetation) (11)
- ☐ No green building guides are in place at this time (12)

Q26 We have environmental sustainability requirements in operations that are were not listed in this survey (please provide a brief description).

_____

_____

_____

_____

_____

Q27 There are no written requirements for environmental sustainability in operations at this time

- Yes (1)
- No (2)

Open-Ended

Q28 Is there anything you would like to add to this survey which was not addressed in the questions?

_____

_____

_____

_____

_____

End of Block: Default Question Block

Appendix E

Survey Instrument – Sustainability Contact

Environmental Sustainability in Universities of the Gulf South: Sustainability Contact

Survey Flow

Standard: Block 1 (2 Questions)
Block: Default Question Block (36 Questions)

EndSurvey: Advanced

Page Break

Start of Block: Block 1

Environmental Sustainability in Universities of the Gulf South

Survey: Sustainability Contact

Human Subject Consent Form

This is a summary of a survey you are asked to participate in. Please read this information prior to signing the statement below.

Title of Study: Environmental Sustainability in Universities of the Gulf South

Purpose of Study: The purpose of this study is to determine the sustainability practices in universities of the gulf south, to determine if universities with a higher level of research productivity have a higher level of environmental sustainability, and to

determine if certain types of universities are more likely to incorporate environmental sustainability practices.

Subjects of Study: Universities in the Gulf South, who reported research expenditures in the Higher Education Research and Development Survey (HERD) between 2013 and 2022, were selected to participate in this survey.

Procedures of Study: In this research, you will answer a series of questions related to environmental sustainability practices on your campus. You will also answer basic questions regarding your institution. Surveys will be assigned a number and the deidentified survey results will be stored on a password protected laptop. You may change your answers at any time prior to submitting the survey. This survey will be sent once a week, or until you complete the survey, for up to three weeks.

Time Expectations: It is estimated that this study may take approximately 15-30 minutes. If allocating 15-30 minutes is challenging, you do not have to complete the survey in a single setting. You can come back to the survey by following the link in the invitation email.

Benefits: Participants will not be compensated for completing the survey, but may potentially benefit from the outcomes of the study.

Risks: Your participation in this survey is voluntary. The survey will be conducted electronically, so there should be no physical risk. The results of the research will be published, but your name will not be used. Confidentiality and anonymity are potential

risks that will be mitigated based on the procedures section above. If you choose not to participate, or to withdraw from the study at any time, there will be no penalty.

Contacts: Questions regarding the research, subjects' rights and other matters may be sent to these contacts.

Doctoral Student: Carol Lunn (clunn1@uno.edu)

Dissertation Chair: Bethany Stich (bstich@uno.edu)

IRB Chair Roberto Refinetti (unoirb@uno.edu or 504-280-7481)

If you agree to take part in this study, then you agree to the following: I have read and understand the description of the study. My participation is voluntary and my participation, or refusal to participate, will not impact my relationship with the University of New Orleans. I understand that I may withdraw from the study at any time.

Thank you for your time and consideration.

Do you agree to participate in this study? (If no, the survey will close when you hit next. If yes, the survey will continue.)

- ○ Yes (1)
- ○ No (2)

Skip To: End of Survey If QID23 = 2

End of Block: Block 1

Start of Block: Default Question Block

General Questions

Q1 What is the name of your institution?

_____

Q2 What is the title of the person completing the survey?

_____

Q3 What is the name of the person completing the survey?

_____

University Commitment, Budget, and Communication

Q4 Does your institution have a written commitment to environmental sustainability in your mission statement, vision statement or institutional effectiveness program?

- Yes (1)
- No (2)

Q5 Does your institution have a written commitment to include environmental sustainability in your academic mission?

- Yes (1)
- No (2)

Q6 Does your campus offer an orientation session about environmental sustainability initiatives to students, faculty or staff?

- Yes (1)
- No (2)

Q7 Does your campus have a structured framework and clear expectations for the campus operations to increase environmental sustainability?

- Yes (1)
- No (2)

Q8 Has your campus signed a sustainability agreement or declaration (i.e. Talloires Declaration, or The American College & University President's Climate Commitment)?

- Yes (1)
- No (2)

Q9 Has your campus used a sustainability assessment tool to evaluate environmental sustainability efforts (i.e. National Wildlife Federation: State of the Campus Environment Survey, University Leaders for a Sustainable Future: Sustainability Assessment Questionnaire for Colleges and Universities, or The Association for the Advancement of Sustainability in Higher Education: The Sustainability Tracking, Assessment and Rating System (STARS))?

- Yes (1)
- No (2)

Q10 Does your campus have a full-time paid position to lead environmental sustainability issues?

- Yes (1)
- No (2)

Q11 If your campus has a full-time paid position to lead environmental sustainability issues, where do they report?

- Central administration (1)
- Facilities, Physical Plant, Operations department (2)
- Academic Dean of College (3)
- Board of Trustees (4)
- Other position or department (specify) (5) _____
- Not applicable (6)

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- Yes (1)
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Education, Engagement, and Outreach

Q14 Are students at your institution required to take a course on environmental sustainability topics or issues (select all that apply)?

- [ ] Yes – all undergraduate students are required to take a course (1)
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Q18 Are you aware of research funding related to environmental sustainability on your campus?

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Q19 Does your institution have research centers or institutes focused on environmental sustainability?

- Yes (1)
- No (2)

Q20 Does your institution have large interdisciplinary grants related to environmental sustainability?

- Yes (1)
- No (2)

Green Infrastructure

Q21 Does your campus include green infrastructure in campus operations (select all that apply)?

- [ ] Native Plants are required in landscaping projects (1)
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- [ ] Buffer zones to protect wetlands, or other bodies of water near campus (5)
- [ ] Green parking (6)
- [ ] Green roofs and/or downspout disconnection (7)
- [ ] Green street, green alleys or permeable pavements (8)
- [ ] Rainwater harvesting (9)
- [ ] No green infrastructure projects are in place at this time (10)

Sustainable Operations

Does your campus include sustainability options in any of the operating services listed below (select all that apply)?

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- [ ] Paper (1)
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- [ ] Aluminum (3)
- [ ] Glass (4)
- [ ] Plastic (5)
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- ☐ There are environmental performance requirements for updates of existing buildings (3)
- ☐ There is at least one building with a green roof (roof planted with vegetation) (11)
- ☐ No green building guides are in place at this time (12)

Q26 We have environmental sustainability requirements in operations that are were not listed in this survey (please provide a brief description).

_____

_____

_____

_____

_____

Q27 There are no written requirements for environmental sustainability in operations at this time

- Yes (1)
- No (2)

Open-Ended

Q28 Is there anything you would like to add to this survey which was not addressed in the questions?

_____

_____

_____

_____

_____

End of Block: Default Question Block

Appendix F

Table documentation for the IPEDS Access database, 2021-22

Table documentation for the IPEDS Access database, 2021-22

Table 1 Mission Statement

Survey: Institutional Characteristics

Year Coverage: Academic year 2021-22

Table Name: IC2021MISSION

Table Title: Mission statement

Description: This table contains institution's mission statement or the web address of the mission statement

Release: Provisional/final (institutions are not allowed to revise these data)

The unit ID, mission statement url, or mission statement were provided for each school from this table.

Final/revised release

Table 2 Directory Information

Survey: Institutional Characteristics

Year Coverage: Academic year 2021-22

Table Name: HD2021

Table Title: Directory information

Description: This table contains directory information for every institution in the 2021 IPEDS universe. Includes name, address, city, state, zip code and various URL links to the institution's home page, admissions, financial aid offices and the net price calculator. Identifies institutions as currently active, institutions that participate in Title IV federal financial aid programs for which IPEDS is mandatory. It also includes variables derived from the 2021-22 Institutional Characteristics survey, such as control and level of institution, highest level and highest degree offered and Carnegie classifications.

Release: Provisional/final (institutions are not allowed to revise these data)

These are the variables provided in HD20021:

varName	**varTitle**
INSTNM	Institution (entity) name
ADDR	Street address or post office box
CITY	City location of institution
STABBR	State abbreviation
ZIP	ZIP code
FIPS	FIPS state code
OBEREG	Bureau of Economic Analysis (BEA) regions
CHFNM	Name of chief administrator
CHFTITLE	Title of chief administrator
GENTELE	General information telephone number
FAIDURL	Financial aid office web address
ADMINURL	Admissions office web address
APPLURL	Online application web address
DISAURL	Disability Services Web Address
EIN	Employer Identification Number
DUNS	Dun and Bradstreet numbers
OPEID	Office of Postsecondary Education (OPE) ID Number
OPEFLAG	OPE Title IV eligibility indicator code
WEBADDR	Institution's internet website address
NPRICURL	Net price calculator web address
SECTOR	Sector of institution
ICLEVEL	Level of institution

CONTROL	Control of institution
HLOFFER	Highest level of offering
UGOFFER	Undergraduate offering
GROFFER	Graduate offering
HDEGOFR1	Highest degree offered
DEGGRANT	Degree-granting status
HBCU	Historically Black College or University
HOSPITAL	Institution has hospital
MEDICAL	Institution grants a medical degree
TRIBAL	Tribal college
CARNEGIE	Carnegie Classification 2000
LOCALE	Degree of urbanization (Urban-centric locale)
OPENPUBL	Institution open to the general public
ACT	Status of institution
NEWID	UNITID for merged schools
DEATHYR	Year institution was deleted from IPEDS
CLOSEDAT	Date institution closed
CYACTIVE	Institution is active in current year
POSTSEC	Primarily postsecondary indicator
PSEFLAG	Postsecondary institution indicator
PSET4FLG	Postsecondary and Title IV institution indicator
RPTMTH	Reporting method for student charges, graduation rates, retention rates and student financial aid
INSTCAT	Institutional category
CCBASIC	Carnegie Classification 2005/2010: Basic
LANDGRNT	Land Grant Institution
DFRCGID	Data Feedback Report comparison group created by NCES
C15BASIC	Carnegie Classification 2015: Basic
C21IPUG	Carnegie Classification 2021: Undergraduate Instructional Program
C21IPGRD	Carnegie Classification 2021: Graduate Instructional Program
C21UGPRF	Carnegie Classification 2021: Undergraduate Profile
C21ENPRF	Carnegie Classification 2021: Enrollment Profile
C21SZSET	Carnegie Classification 2021: Size and Setting
C18BASIC	Carnegie Classification 2018: Basic
C21BASIC	Carnegie Classification 2021: Basic
DFRCUSCG	Data Feedback Report - Institution submitted a custom comparison group
F1SYSTYP	Multi-institution or multi-campus organization
F1SYSCOD	Identification number of multi-institution or multi-campus organization
F1SYSNAM	Name of multi-institution or multi-campus organization
IALIAS	Institution name alias
CBSA	Core Based Statistical Area (CBSA)

CBSATYPE	CBSA Type Metropolitan or Micropolitan
CSA	Combined Statistical Area (CSA)
NECTA	New England City and Town Area (NECTA)
LONGITUD	Longitude location of institution
LATITUDE	Latitude location of institution
COUNTYCD	Fips County code
COUNTYNM	County name
CNGDSTCD	State and 114TH Congressional District ID
VETURL	Veterans and Military Servicemembers tuition policies web address
INSTSIZE	Institution size category
ATHURL	Student-Right-to-Know student athlete graduation rate web address

Carnegie Classification 2021: Basic (HD2022)

Source: Carnegie Classification of Institutions of Higher Education. https://carnegieclassifications.acenet.edu/carnegie-classification/classification-methodology/basic-classification/ (Accessed May 27, 2024).

"DOCTORAL UNIVERSITIES

Includes institutions that awarded at least 20 research/scholarship doctoral degrees during the update year and also institutions with below 20 research/scholarship doctoral degrees that awarded at least 30 professional practice doctoral degrees in at least 2 programs. Excludes Special Focus Institutions and Tribal Colleges and Universities.

The first two categories include only institutions that awarded at least 20 research/scholarship doctoral degrees and had at least $5 million in total research expenditures (as reported through the National Science Foundation (NSF) Higher Education Research & Development Survey (HERD)).

MASTER'S COLLEGES AND UNIVERSITIES

Generally includes institutions that awarded at least 50 master's degrees and fewer than 20 doctoral degrees during the update year (with occasional exceptions – see Methodology). Excludes Special Focus Institutions and Tribal Colleges and Universities.

BACCALAUREATE COLLEGES

Includes institutions where baccalaureate or higher degrees represent at least 50 percent of all degrees but where fewer than 50 master's degrees or 20 doctoral degrees were awarded during the update year. (Some institutions above the master's degree threshold are also included; see Exception.) Excludes Special Focus Institutions and Tribal Colleges and Universities. The formal expression of

these classifications is (Classification):(Subset). For example: Baccalaureate Colleges: Diverse Fields.

BACCALAUREATE/ASSOCIATE'S COLLEGES

Includes four-year colleges, by virtue of having at least one baccalaureate degree program, that conferred more than 50 percent of degrees at the associate's level (but excluding special focus institutions, Tribal Colleges and Universities, and institutions that have sufficient master's or doctoral degrees to fall into those categories). These institutions are divided into two subcategories: Mixed Baccalaureate/Associate's Colleges are those that conferred more than 10% of degrees at the baccalaureate level or higher (fewer than 90% associate's degrees); Associate's Dominant institutions are those that conferred fewer than 10% of degrees at the baccalaureate level or higher (at least 90% associate's degrees).

ASSOCIATE'S COLLEGES

Institutions at which the highest level of degree awarded is an associate's degree. The institutions are sorted into nine categories based on the intersection of two factors: disciplinary focus (transfer, career & technical or mixed) and dominant student type (traditional, nontraditional or mixed). Excludes Special Focus Institutions and Tribal Colleges and Universities. The formal expression of these classifications is (Classification):(Subset). For example: Associate's Colleges: Mixed Transfer/Career & Technical-Mixed Traditional/Nontraditional.

SPECIAL FOCUS INSTITUTIONS

Institutions where a high concentration of degrees is in a single field or set of related fields. Excludes Tribal Colleges and Universities. The formal expression of these classifications is (Classification):(Subset). For example: *Special Focus Two-Year: Technical Professions.*"

Carnegie Classification 2021: Enrollment Profile (HD2022)

Source: Carnegie Classification of Institutions of Higher Education. https://carnegieclassifications.acenet.edu/carnegie-classification/classification-methodology/enrollment-profile-classification/ (Accessed May 27, 2024).

"Exclusively Undergraduate Two-Year

Fall enrollment data show only undergraduates enrolled at these associate's degree granting institutions.

Exclusively Undergraduate Four-Year

Fall enrollment data show only undergraduates enrolled at these bachelor's or higher degree granting institutions.

Very High Undergraduate

Fall enrollment data show both undergraduate and graduate students, with the latter group accounting for less than 10 % of FTE* enrollment.

High Undergraduate

Fall enrollment data includes both undergraduate and graduate students, with the latter group accounting for 10–24 % of FTE* enrollment.

Majority Undergraduate

Fall enrollment data includes both undergraduate and graduate students, with the latter group accounting for 25–49 % of FTE* enrollment.

Majority Graduate

Fall enrollment data includes both undergraduate and graduate students, with the latter group accounting for at least half of FTE* enrollment.

Exclusively Undergraduate

Fall enrollment data includes only graduate students enrolled."

Carnegie Classification 2021: Graduate Instructional Program (HD2022)

Source: Carnegie Classification of Institutions of Higher Education. https://carnegieclassifications.acenet.edu/carnegie-classification/classification-methodology/graduate-instructional-program-classification/ (Accessed May 27, 2024).

"POSTBACCALAUREATE

Institutions Awarding Master's or Professional Practice/Other Doctoral Degrees

Single Program – Education

These institutions awarded master's or professional practice/other doctoral degrees in education as their only postbaccalaureate program.

Single Program – Business

These institutions awarded master's or professional practice/other doctoral degrees in business as their only postbaccalaureate program.

Single Program – Other

These institutions awarded master's or professional practice/other doctoral degrees in a single field other than education or business as their only postbaccalaureate program.

Comprehensive programs

These institutions awarded at least one master's degree or professional practice/other doctoral degrees in each of the humanities, social sciences, and

STEM fields, as well as such graduate degrees in one or more professional fields.

Arts & sciences-dominant

These institutions awarded master's or professional practice/other doctoral degrees in some arts and sciences fields. They may also award master's or non-research doctoral degrees in other fields, but in lesser numbers.

Education-dominant, with arts & sciences

These institutions awarded master's or professional practice/other doctoral degrees in both arts and sciences and professional fields, and the field with the largest number of such graduate degrees was education.

Education-dominant, with other professional programs

These institutions awarded master's or professional practice/other doctoral degrees in professional fields only, and the field with the largest number of such graduate degrees was education.

Business-dominant, with arts & sciences

These institutions awarded master's or professional practice/other doctoral degrees in both arts and sciences and professional fields, and the field with the largest number of such graduate degrees was business.

Business-dominant, with other professional programs

These institutions awarded master's or professional practice/other doctoral degrees in professional fields only, and the field with the largest number of such graduate degrees was business.

Other-dominant, with arts & sciences

These institutions awarded master's or professional practice/other doctoral degrees in both arts and sciences and professional fields, and the field with the largest number of such graduate degrees was a professional field other than business or education.

Other-dominant, with other professional programs

These institutions awarded master's or professional practice/other doctoral degrees in professional fields only, and the field with the largest number of such graduate degrees was a field other than business or education.

RESEARCH DOCTORAL

Institutions Awarding Research Doctoral Degrees

Single program – Education

These institutions awarded research doctoral degrees in education but not in other fields (they may have more extensive offerings at the master's or professional practice/other doctoral level).

Single program – Other

These institutions awarded research doctoral degrees in a single field other than education (they may have more extensive offerings at the master's or professional practice/other doctoral level).

Comprehensive programs, with medical/veterinary school

These institutions awarded research doctoral degrees in the humanities, social sciences, and STEM fields, as well as in medicine, dentistry, and/or veterinary medicine. They also offer may also offer master's and professional practice/other doctoral degrees in other fields.

Comprehensive programs, no medical/veterinary school

These institutions awarded research doctoral degrees in the humanities, social sciences, and STEM fields. They may also offer master's or professional practice/other degrees in fields other than medicine, dentistry, or veterinary medicine.

Humanities/social sciences-dominant

These institutions awarded research doctoral degrees in a range of fields, with the largest number of research doctorates in the humanities or social sciences.

STEM-dominant

These institutions awarded research doctoral degrees in a range of fields, with the largest number of research doctorates in the STEM fields.

Professional-dominant

These institutions awarded research doctoral degrees in a range of fields, and the largest number of research doctorates were in professions other than engineering (such as education, health professions, law, public policy, or social work)."

Carnegie Classification 2021: Size and Setting (HD2022)

Source: Carnegie Classification of Institutions of Higher Education. https://carnegieclassifications.acenet.edu/carnegie-classification/classification-methodology/size-setting-classification/ (Accessed May 27, 2024).

"TWO YEAR

Very Small

Fall enrollment data indicate FTE* enrollment of less than 500 students at these associate's degree granting institutions.

Small

Fall enrollment data indicate FTE* enrollment of 500–1,999 students at these associate's degree granting institutions.

Medium

Fall enrollment data indicate FTE* enrollment of 2,000–4,999 students at these associate's degree granting institutions.

Large

Fall enrollment data indicate FTE* enrollment of 5,000–9,999 students at these associate's degree granting institutions.

Very Large

Fall enrollment data indicate FTE* enrollment of at least 10,000 students at these associate's degree granting institutions.

FOUR YEAR

Very small

Primarily Nonresidential

Fall enrollment data indicate FTE* enrollment of fewer than 1,000 degree-seeking students at these bachelor's or higher degree granting institutions. Fewer than 25 % of degree-seeking undergraduates live on campus** and/or fewer than 50 % attend full time (includes exclusively distance education institutions).

Primarily Residential

Fall enrollment data indicate FTE* enrollment of fewer than 1,000 degree-seeking students at these bachelor's or higher degree granting institutions. 25-49 % of degree-seeking undergraduates live on campus** and at least 50 % attend full time.

Highly Residential

Fall enrollment data indicate FTE* enrollment of fewer than 1,000 degree-seeking students at these bachelor's or higher degree granting institutions. At least half of degree-seeking undergraduates live on campus** and at least 80 % attend full time.

Small

Primarily Nonresidential

Fall enrollment data indicate FTE* enrollment of 1,000–2,999 degree-seeking students at these bachelor's or higher degree granting institutions. Fewer than 25 % of degree-seeking undergraduates live on campus** and/or fewer than 50 % attend full time (includes exclusively distance education institutions).

Primarily Residential

Fall enrollment data indicate FTE* enrollment of 1,000–2,999 degree-seeking students at these bachelor's or higher degree granting institutions. 25-49 % of degree-seeking undergraduates live on campus** and at least 50 % attend full time.

Highly Residential

Fall enrollment data indicate FTE* enrollment of 1,000–2,999 degree-seeking students at these bachelor's or higher degree granting institutions. At least half of degree-seeking undergraduates live on campus** and at least 80 % attend full time.

Medium

Primarily Nonresidential

Fall enrollment data indicate FTE* enrollment of 3,000–9,999 degree-seeking students at these bachelor's or higher degree granting institutions. Fewer than 25 % of degree-seeking undergraduates live on campus** and/or fewer than 50 % attend full time (includes exclusively distance education institutions).

Primarily Residential

Fall enrollment data indicate FTE* enrollment of 3,000–9,999 degree-seeking students at these bachelor's or higher degree granting institutions. 25-49 % of degree-seeking undergraduates live on campus** and at least 50 % attend full time.

Highly Residential

Fall enrollment data indicate FTE* enrollment of 3,000–9,999 degree-seeking students at these bachelor's or higher degree granting institutions. At least half of degree-seeking undergraduates live on campus** and at least 80 % attend full time.

Large

Primarily Nonresidential

Fall enrollment data indicate FTE* enrollment of at least 10,000 degree-seeking students at these bachelor's or higher degree granting institutions. Fewer than 25

% of degree-seeking undergraduates live on campus** and/or fewer than 50 % attend full time (includes exclusively distance education institutions).

Primarily Residential

Fall enrollment data indicate FTE* enrollment of at least 10,000 degree-seeking students at these bachelor's or higher degree granting institutions. 25-49 % of degree-seeking undergraduates live on campus** and at least 50 % attend full time.

Highly Residential

Fall enrollment data indicate FTE* enrollment of at least 10,000 degree-seeking students at these bachelor's or higher degree granting institutions. At least half of degree-seeking undergraduates live on campus** and at least 80 % attend full time.

EXCLUSIVELY GRADUATE/PROFESSIONAL

Fall enrollment data indicate that there are no undergraduates enrolled at these institutions. All enrolled students are in graduate-level programs."

Carnegie Classification 2021: Undergraduate Instructional Program (HD2022)

Source: Carnegie Classification of Institutions of Higher Education. https://carnegieclassifications.acenet.edu/carnegie-classification/classification-methodology/undergraduate-instructional-program-classification/ (Accessed May 27, 2024).

"ASSOCIATES COLLEGES

High Transfer

These institutions awarded associates degrees but no bachelor's degrees with fewer than 30% of awards (degrees and certificates) in career & technical programs.

Mixed Transfer/Career & Technical

These institutions awarded associates degrees but no bachelor's degrees with 30-49% of awards (degrees and certificates) in career & technical programs.

High Career & Technical

These institutions awarded associates degrees but no bachelor's degrees with more than 50% of awards (degrees and certificates) in career & technical programs.

SPECIAL FOCUS TWO-YEAR INSTITUTIONS

These institutions awarded associates degrees but no bachelor's degrees with typically more than 75% of awards in a single career & technical program.

BACCALAUREATE/ASSOCIATES COLLEGES

These institutions awarded both associates and bachelor's degrees, but the majority of degrees awarded were at the associates level.

BACCALAUREATE COLLEGES

The majority of undergraduate degrees awarded by these institutions were bachelor's degrees.

Arts & sciences focus, no graduate coexistence

At least 80 % of bachelor's degree majors were in the arts and sciences, and no graduate degrees were awarded in fields corresponding to undergraduate majors.

Arts & sciences focus, some graduate coexistence

At least 80 % of bachelor's degree majors were in the arts and sciences, and graduate degrees were observed in up to half of the fields corresponding to undergraduate majors.

Arts & sciences focus, high graduate coexistence

At least 80 % of bachelor's degree majors were in the arts and sciences, and graduate degrees were observed in at least half of the fields corresponding to undergraduate majors.

Arts & sciences plus professions, no graduate coexistence

60–79 % of bachelor's degree majors were in the arts and sciences, and no graduate degrees were awarded in fields corresponding to undergraduate majors.

Arts & sciences plus professions, some graduate coexistence

60–79 % of bachelor's degree majors were in the arts and sciences, and graduate degrees were observed in up to half of the fields corresponding to undergraduate majors.

Arts & sciences plus professions, high graduate coexistence

60–79 % of bachelor's degree majors were in the arts and sciences, and graduate degrees were observed in at least half of the fields corresponding to undergraduate majors.

Balanced arts & sciences/professions, no graduate coexistence

Bachelor’s degrees awarded were relatively balanced between arts and sciences and professional fields (41–59 % in each), and no graduate degrees were awarded in fields corresponding to undergraduate majors.

Balanced arts & sciences/professions, some graduate coexistence

Bachelor’s degree majors were relatively balanced between arts and sciences and professional fields (41–59 % in each), and graduate degrees were observed in up to half of the fields corresponding to undergraduate majors.

Balanced arts & sciences/professions, high graduate coexistence

Bachelor’s degree majors were relatively balanced between arts and sciences and professional fields (41–59 % in each), and graduate degrees were observed in at least half of the fields corresponding to undergraduate majors.

Professions plus arts & sciences, no graduate coexistence

According to the degree data, 60–79 % of bachelor’s degree majors were in professional fields (such as business, education, engineering, health, and social work), and no graduate degrees were awarded in fields corresponding to undergraduate majors.

Professions plus arts & sciences, some graduate coexistence

60–79 % of bachelor’s degree majors were in professional fields, and graduate degrees were observed in up to half of the fields corresponding to undergraduate majors.

Professions plus arts & sciences, high graduate coexistence

60–79 % of bachelor’s degree majors were in professional fields, and graduate degrees were observed in at least half of the fields corresponding to undergraduate majors.

Professions focus, no graduate coexistence

At least 80 % of bachelor’s degree majors were in professional fields (such as business, education, engineering, health, and social work), and no graduate degrees were awarded in fields corresponding to undergraduate majors.

Professions focus, some graduate coexistence

At least 80 % of bachelor’s degree majors were in professional fields, and graduate degrees were observed in up to half of the fields corresponding to undergraduate majors.

Professions focus, high graduate coexistence

At least 80 % of bachelor's degree majors were in professional fields, and graduate degrees were observed in at least half of the fields corresponding to undergraduate majors."

Carnegie Classification 2021: Undergraduate Profile (HD2022)

Source: Carnegie Classification of Institutions of Higher Education. https://carnegieclassifications.acenet.edu/carnegie-classification/classification-methodology/undergraduate-profile-classification/ (Accessed May 27, 2024).

"Inclusive, Selective, and More Selective

Institutions that enroll baccalaureate degree seeking students are distinguished according to their admissions selectivity into three groups: inclusive, selective, and more selective. Institutions report SAT and/or ACT scores if those scores are required as part of their admissions policy. For these institutions the selectivity designation is based on test scores. For test-optional, or test not required institutions that are do not indicate that they have an open admissions policy, the designation is based on percent of applicants admitted. Open admissions institutions are all placed into the "inclusive" category."

Higher part-time

Fall enrollment data indicate at least 40 percent of undergraduates are enrolled part-time at these bachelor's or higher degree granting institutions.

Higher Medium full-time, inclusive, lower transfer-in

Fall enrollment data indicate 60–79 percent of undergraduates are enrolled full-time at these bachelor's or higher degree granting institutions. These institutions either did not report test score data or the scores indicate that they extend educational opportunity to a wide range of students with respect to academic preparation and achievement. Fewer than 20 percent of entering undergraduates are transfer students.

Medium full-time, inclusive, higher transfer-in

Fall enrollment data indicate 60–79 percent of undergraduates are enrolled full-time at these bachelor's or higher degree granting institutions. These institutions either did not report test score data or the scores indicate that they extend educational opportunity to a wide range of students with respect to academic preparation and achievement. At least 20 percent of entering undergraduates are transfer students.

Medium full-time, selective or more selective, lower transfer-in

Fall enrollment data indicate 60–79 percent of undergraduates are enrolled full-time at these bachelor's or higher degree granting institutions. Test score data for first-year students indicate that these institutions are selective or more selective

in admissions. Fewer than 20 percent of entering undergraduates are transfer students.

Medium full-time, selective or more selective, higher transfer-in

Fall enrollment data indicate 60–79 percent of undergraduates are enrolled full-time at these bachelor's or higher degree granting institutions. Test score data for first-year students indicate that these institutions are selective or more selective in admissions. At least 20 percent of entering undergraduates are transfer students.

Full-time, inclusive, lower transfer-in

Fall enrollment data indicate at least 80 percent of undergraduates are enrolled full-time at these bachelor's or higher degree granting institutions. These institutions either did not report test score data or the scores indicate that they extend educational opportunity to a wide range of students with respect to academic preparation and achievement. Fewer than 20 percent of entering undergraduates are transfer students.

Full-time, inclusive, higher transfer-in

Fall enrollment data indicate at least 80 percent of undergraduates are enrolled full-time at these bachelor's or higher degree granting institutions. These institutions either did not report test score data or the scores indicate that they extend educational opportunity to a wide range of students with respect to academic preparation and achievement. At least 20 percent of entering undergraduates are transfer students.

Full-time, selective, lower transfer-in

Fall enrollment data indicate at least 80 percent of undergraduates are enrolled full-time at these bachelor's or higher degree granting institutions. Test score data for first-year students indicate that these institutions are selective in admissions (40th to 80th percentile of selectivity among all baccalaureate institutions). Fewer than 20 percent of entering undergraduates are transfer students.

Full-time, selective, higher transfer-in

Fall enrollment data indicate at least 80 percent of undergraduates are enrolled full-time at these bachelor's or higher degree granting institutions. Test score data for first-year students indicate that these institutions are selective in admissions (40th to 80th percentile of selectivity among all baccalaureate institutions). At least 20 percent of entering undergraduates are transfer students.

Full-time, more selective, lower transfer-in

Fall enrollment data indicate at least 80 percent of undergraduates are enrolled full-time at these bachelor's or higher degree granting institutions. Test score data for first-year students indicate that these institutions are more selective in admissions (80th to 100th percentile of selectivity among all baccalaureate institutions). Fewer than 20 percent of entering undergraduates are transfer students.

Full-time, more selective, higher transfer-in

Fall enrollment data indicate at least 80 percent of undergraduates are enrolled full-time at these bachelor's or higher degree granting institutions. Test score data for first-year students indicate that these institutions are more selective in admissions (80th to 100th percentile of selectivity among all baccalaureate institutions). At least 20 percent of entering undergraduates are transfer students."

Degree of urbanization (Urban-centric locale) (HD2022)

Source: National Center for Education Statistics (NCES) Locale Classifications and Criteria https://nces.ed.gov/programs/edge/docs/LOCALE_CLASSIFICATIONS.pdf (Accessed May 27, 2024).

"The NCES locale framework is composed of four basic types (City, Suburban, Town, and Rural) that each contains three subtypes. It relies on standard urban and rural definitions developed by the U.S. Census Bureau, and each type of locale is either urban or rural in its entirety. The NCES locales can be fully collapsed into a basic urban–rural dichotomy, or expanded into a more detailed collection of 12 distinct categories. These subtypes are differentiated by size (in the case of City and Suburban assignments) and proximity (in the case of Town and Rural assignments).

City – Large: Territory inside an Urbanized Area and inside a Principal City with population of 250,000 or more.

City – Midsize: Territory inside an Urbanized Area and inside a Principal City with population less than 250,000 and greater than or equal to 100,000.

City – Small: Territory inside an Urbanized Area and inside a Principal City with population less than 100,000.

Suburban – Large: Territory outside a Principal City and inside an Urbanized Area with population of 250,000 or more.

Suburban – Midsize: Territory outside a Principal City and inside an Urbanized Area with population less than 250,000 and greater than or equal to 100,000.

Suburban – Small): Territory outside a Principal City and inside an Urbanized Area with population less than 100,000.

Town – Fringe: Territory inside an Urban Cluster that is less than or equal to 10 miles from an Urbanized Area.

Town – Distant: Territory inside an Urban Cluster that is more than 10 miles and less than or equal to 35 miles from an Urbanized Area.

Town – Remote: Territory inside an Urban Cluster that is more than 35 miles from an Urbanized Area.

Rural – Fringe: Census-defined rural territory that is less than or equal to 5 miles from an Urbanized Area, as well as rural territory that is less than or equal to 2.5 miles from an Urban Cluster.

Rural – Distant: Census-defined rural territory that is more than 5 miles but less than or equal to 25 miles from an Urbanized Area, as well as rural territory that is more than 2.5 miles but less than or equal to 10 miles from an Urban Cluster.

Rural – Remote: Census-defined rural territory that is more than 25 miles from an Urbanized Area and also more than 10 miles from an Urban Cluster."

Vita

The author was born in New Orleans, Louisiana and is a first generation college student. She obtained her Bachelor's degree in business administration from UNO in 1998, and her Master's degree in business administration from UNO in 2000. Carol is currently the Assistant Vice President for Research and Economic Development at UNO, co-director of UNO's Sustainability Circle, Advisor to the UNO Garden Club, and manages Keep UNO Beautiful. Her research addresses issues of sustainability, with a focus on institutions of higher education. She plans to finish her doctorate in August 2024.