

The Cross-Disciplinary Classroom: Exploring Climate, Design and Community Resilience at the University of Florida

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This paper explores University of Florida’s (UF) interdisciplinary coursework that centers student research on climate, policy, and design projects in coastal communities along the Atlantic and Gulf of Mexico. The evolution of interdisciplinary pedagogy is addressed through case studies of the Florida Climate Institute’s (FCI) Spring Fieldcourses, the Envision Resilience Nantucket Challenge, and the Historic Preservation program’s Preservation Institute Nantucket (PIN) summer program.

In the FCI Fieldcourses, the focus has spanned ecological systems, built environment, and community engagement frameworks with UF faculty from design, planning, historic preservation, engineering, law, communications, and science, among other disciplines. PIN’s 2020 and 2021 research and coursework focused on the development of an adaptation and resilience strategy for a portion of Nantucket Town—one of the nation’s largest National Historic Landmark Districts. The Envision Resilience Nantucket Challenge, held in Spring 2021 and sponsored by ReMain Nantucket, was inspired by PIN and based in part on the Fieldcourse model.

The case studies illustrate the evolving methodology of coursework at UF and the changing relationship between design and sciences/social science disciplines for the breadth of iterative, solution-based thinking for climate change. Concluding thoughts will explore the evolution of interdisciplinary design research at UF, potential gaps in disciplinary partnerships, and future project opportunities for addressing the critical complexities of climate change.

INTRODUCTION

The University of Florida (UF) has advanced cross-disciplinary coursework that centers applied design research on climate change, with a focus on social equity, placemaking, and adaptation in coastal communities. Case studies from the Florida Climate Institute’s (FCI) Spring Fieldcourse and the Historic Preservation Program’s Preservation Institute Nantucket (PIN) illustrate the evolution of these initiatives, and the

instrumental shaping of the upcoming Envision Resilience Nantucket Challenge, a multi-university effort to engage a nationwide network of design courses in adaptation research.

The FCI Spring Fieldcourse, created in 2016, has spanned ecological systems, built environment and community engagement frameworks with UF faculty and students from disciplines such as design, planning, historic preservation, engineering, law, communications, science, and agriculture, among others. The goal of the Fieldcourse is to provide students a firm grounding in the science, law & policy, and economics associated with sea-level rise and climate change through an interdisciplinary and experiential collaborative approach. This course combines classroom lectures and disciplinary integration with an intensive field experience; students learning occurs through field-based immersion, practitioner lectures, and reflective discussions in an interdisciplinary context. Student teams verbalize and defend their findings and recommendations in an open forum designed to highlight their learning.

The 2017 Cedar Key Fieldcourse focused on ecological, coastal and marine issues in a small fishing village on the Gulf of Mexico. The 2018 St. Augustine Fieldcourse evolved to study built environment climate impacts, with students proposing adaptation strategies for increased coastal flooding. The 2020 Port St. Joe Fieldcourse focused on long-term recovery and resilience following Hurricane Michael (2018). Students participating in the Fieldcourse have consistently noted a broadening of their perspective and a new interest in the value of a cross-disciplinary approach for their future professional work.

Approaching the fiftieth anniversary of its official founding, PIN represents the evolution of historic preservation studies from concern for the changing built environment to the intersection of human and nature as representational of culture and history. Shifting its focus to rising seas and resilience, the pedagogical model has become more valuable to both student and community in addressing a climate priority: increased flooding events. PIN’s newest initiative, Resilient Nantucket, includes researcher and student work to digitally document historic buildings in relation to the waterfront, prepare 3D models



Figure 1. Port St. Joe: Students from the Law School and School of Journalism discuss ecological restoration during the Spring 2020 Fieldcourse. Image credit: Jeff Carney.

and visualizations of sea level rise, and assess the vulnerability of built and natural environments. In 2020, PIN's cross-disciplinary student teams assessed the cultural landscape of the South Washington Street area to prepare a strategic framework for adaptation and enhanced resilience.

The work of PIN has informed the development of the Envision Resilience Nantucket Challenge by ReMain Nantucket, an island-based non-profit dedicated to a more sustainable and resilient community. Based in part on the FCI Fieldcourse model, in Spring 2021 design colleges from across the U.S. will assemble student teams of architects, landscape architects, planners, engineers, policy experts, and conservationists to reimagine Nantucket's core and historic waterfront. Student learning outcomes will include applying lessons learned from coastal communities around the country and proposing globally transferrable approaches to the impact of sea level rise.

NORTH PORT ST. JOE AND ENVISION RESILIENCE NANTUCKET CHALLENGE

Each course was developed to address the tremendous challenge of climate change adaptation through an interdisciplinary community-based setting. There are three main pedagogical pillars that were brought together through these courses. First, exposure to knowledge and process through an intensive lecture series during the semester. Second, design exploration as a process that invites students to imagine possible futures then develop the visual arguments for their development. Third, public interaction as the culmination of the semester, requiring students to bring ideas to the community in language that communicates directly and sparks two-way conversation.

The two course sites, Port St. Joe, Florida and Nantucket Island, Massachusetts, are small coastal communities with historic industrial roots and substantially diminished maritime economies. In the 19th century Port St. Joe was a thriving port city where the Florida Constitution was signed. In the early 20th century the St. Joe Paper Company established a large paper mill and the community was a thriving industrial town through the 1990's. In the 19th century Nantucket was the global center of the international whaling trade. In each location, the industry has left and tourism is the current central economic focus. Aside from these particular similarities, the two places could not be more distinct from one another, economically and culturally. Similarly, the two courses share an overall focus on climate change adaptation, and an expressed "design" outcome, but are different in many other ways. The Port St. Joe course was a multi-disciplinary three-credit seminar of primarily non-architecture majors, including upper level undergraduates through doctoral students, while the six-credit Nantucket studio comprised a focused cohort of fourth year undergraduate architecture students.

EXPOSURE TO KNOWLEDGE AND PROCESS: Effective action to build resilience in communities requires access to information, knowledge, and the organizational capacity to put it to use. These courses are designed to provide layered perspectives, data resources, analytical tools, and approaches throughout the early part of the semester through a rapid and extensive series of guest lectures.

The Port St. Joe course was front loaded with twelve lectures from a range of UF faculty on topics such as historic

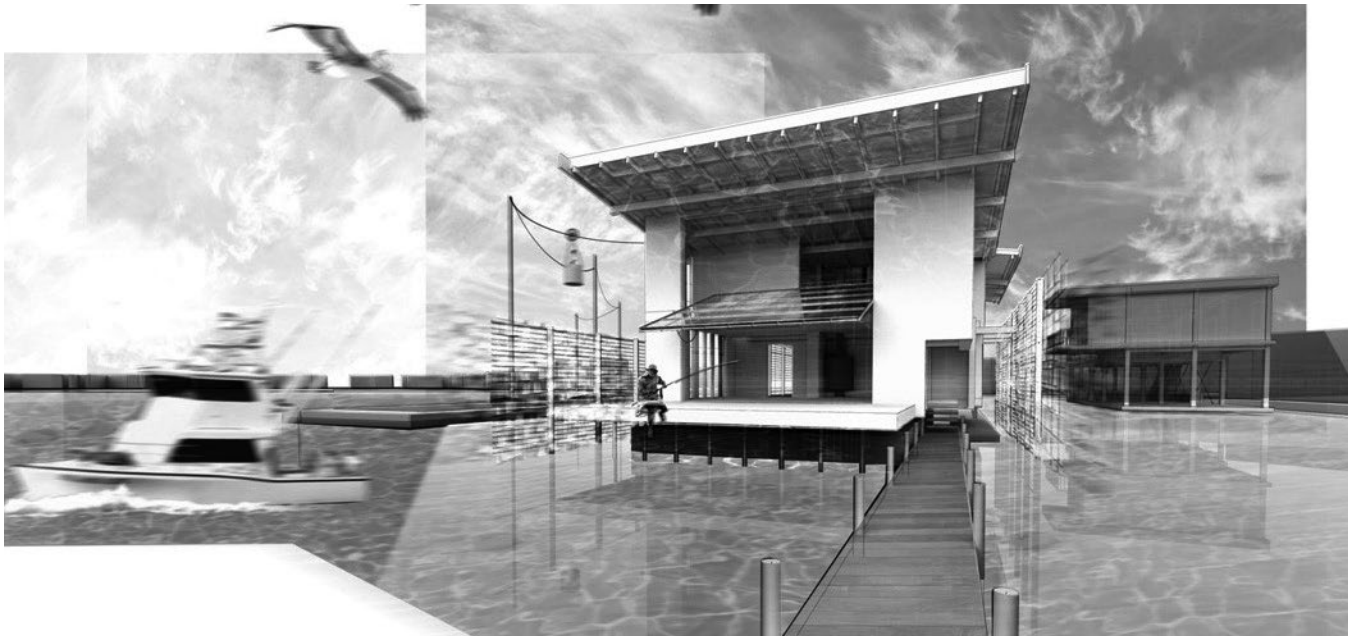


Figure 2. Envision Resilience Nantucket Challenge: This rendering is of the third and final Generational Transformation of the coastal home designed for Nantucket. Image Credit: Suzanne Tielemans.

preservation, land use law, ecological restoration, and the physics of hurricanes. The Nantucket course hosted a weekly lecture series with two lectures per week for nine weeks over the course of the semester. Lecturers were invited to present (through Zoom) to the students of five universities concurrently and represented an equally diverse cross section including futures modeling, civil engineering, and globally recognized landscape architects. In both cases, the goal was to fully immerse students in the language, terminology, and worldviews of others, to help them shape their own views over the course of the semester as their design concepts evolved.

The diversity of perspective presents an open-ended course and provides students with far more information than they can possibly apply to the problem at one time. The challenge as the semester evolves becomes a balance between the complexity of the problem and the ability of students to focus, edit, and navigate the multiple approaches, disciplines, and data resources available.

DESIGN AS PROCESS: The core “design thinking” focus of these courses sets the pedagogical process apart from other research methods, particularly the scientific method, as it is concerned with approaching intractable problems. The design thinking process includes five steps: empathize, define, ideate, prototype, and test.¹

In the Port St. Joe course, students performed initial research about the problem and proposed ideas before even visiting the site. Uncomfortable as it was for students who had little

experience of the place, these initial probes provided important direction for the class to “hit the ground running” during their short one-week trip to the community. In Nantucket – especially because travel was not a possibility due to COVID-19 travel restrictions – speculations preceded the introduction of the project site through a two-week design exploration of Florida landscapes. These initial explorations, though in a completely different part of the country, were important to establish a position for the students’ eventual intervention in Nantucket.

In both cases, students were encouraged to go beyond what the sea level rise data, the city planner, or even their own observations told them and to envision future solutions through creativity and making, then to repeatedly challenge the foundations of these propositions through internal discussions, class presentations, research, and public demonstrations.

PUBLIC INTERACTION AND DEFENSE: Climate change adaptation will be difficult to achieve through scientific research, design speculation, or community engagement alone. Instead, effective action requires a balance of knowledge, vision, and engagement. The public engagement ensures that the course results are expressed directly to the community it serves and that feedback between designer and community member is a two-way conversation.

Students in both courses were asked to present and defend their work for a public audience. In Port St. Joe the presentation occurred on the last day of the one-week trip. The



Figure 3. Preservation Institute Nantucket: Washington Street proposal to convert allow expansion of the existing wetlands known as “The Creeks” and introduce a bike path. Image Credit: PIN.

presentations were reconstructed as an Adobe Spark page and is still available on the UF website.² In Nantucket, the online presentation to an invited panel of critics provided practice for a community presentation in June 2021 and a public exhibit open through December.³

Though the product expectations were completely different, such public discussion ensured a level of empathy and focus on communication that can often be missing from studio work. Though tension and discomfort existed in both courses, the process provided a counter-balance to the speculation and theoretical design of the studio, enabling students to tack back and forth between ideas and their practical application throughout the semester.

PRESERVATION INSTITUTE NANTUCKET (PIN)

Approaching the fiftieth anniversary of its official founding, PIN represents the evolution of historic preservation studies from concern for the changing built environment to the intersection of human and nature as representational of culture and history. Located approximately 30 miles off the coast of Cape Cod, Massachusetts, the Island of Nantucket is a resort community with a year-round population of some 14,000 and as many as 40,000 seasonal residents. Nantucket was designated a U.S.

National Historic Landmark District in 1966 based primarily on its leading role in the global whaling industry from the late 18th through mid-19th centuries. Officially founded in 1972, PIN is America’s oldest, continually operating applied learning and research program (“field school”) for historic preservation. The mission of PIN is to help prepare the next generation of historic preservation leaders while documenting, researching, and conserving the Island community’s cultural resources. Like many coastal communities, Nantucket is increasingly threatened by a changing climate and rising seas. For example, the seven worse flooding events in the Island’s history have occurred in the last decade.

PIN’s program has always included multi-disciplinary students and professionals. Shifting to focus on issues of a changing climate, rising seas, and resilience, the pedagogical model has become more valuable as it helps address a primary need of the community as it addresses increased flooding events. PIN’s newest initiative, Resilient Nantucket, includes researcher and student work to digitally document historic buildings in relation to the waterfront, prepare 3D models and visualizations of sea level rise, and assess the vulnerability of the built and natural environments.⁴



Figure 4. Preservation Institute Nantucket: Washington Street proposal to construct a “catalyst” or demonstration project at 33 Washington Street consisting of a series of platforms that recall previous flood events and sea level rise and projections and replace an existing lawn with grass with a rain garden. Image Credit: PIN.

In 2020 and 2021, PIN students assessed the cultural landscape of the Washington Street area by preparing a strategic framework for adaptation to enhance resilience. The work of PIN has helped inform the development of the Envision Resilience Nantucket Challenge by ReMain Nantucket. This shift was modeled on the success of the 2018 Florida Climate Institute Fieldcourse in St. Augustine, Florida.

The St. Augustine Fieldcourse was a semester-long (16 weeks) multidisciplinary course with an intensive one-week field work component. Five disciplines were represented including: Coastal Engineering, Historic Preservation, Journalism, Law, and Urban and Regional Planning. Sixteen students were organized into three, cross-disciplinary teams and assigned a study area. Course content included eight weeks with readings and expert presentations. The fieldwork portion was one week and focused on data collection and stakeholder engagement. Each team had six weeks to collaborate to develop and publicly present strategies for enhancing resilience in the study areas. Key outcomes included adaptation and resilience strategies informed by history and documentation of the historic urban environment.

Based in part on the St. Augustine fieldcourse, the 2020 and 2021 PIN curriculum included two, three-credit courses delivered via Zoom over six weeks, and engaged six students and six researchers organized into three teams, working remotely due to the pandemic. The overlapping teams were: urban environment, natural environment, and architectural environment. In 2021, the same two-course (six credits) over six weeks was repeated. Building upon the concepts and strategies introduced the prior year, the teams addressed three “focus areas” within the larger study area: Harbor Front and The Creeks, The Creeks Expansion Area, and Union Street – comprised of the oldest, most intact structures.

Both PIN courses were designed around a research and pedagogical approach informed by the concept of cultural landscapes. As defined by the National Park Service, cultural landscapes are a geographic area comprised of natural and cultural resources, and flora and fauna and encapsulate historic events and persons and embody cultural and aesthetic values. Both the tangible and intangible (social-cultural realm) of heritage are considered.⁵ As described by the Cultural Landscape Foundation, cultural landscapes “provide a sense of place and

identify; they map relationships with the land over time; and they are part of the national heritage of each of our lives.”⁶

Considerations for adopting a cultural landscape approach include:

- Emphasize the interaction between nature and human activities including dynamic land use over time and realignment of human interaction with landscape.
- Provide cultural and historical context to adaptation plans focused inspired by historic precedents of adaptation and resilience.
- Consider the etiology of landscape change and the application and adaptation of management strategies for the distinct characteristics of a specific landscape.
- Engage the tangible and intangible realms of heritage to inform place-making – evolving and reimagining the cultural landscape.
- Document and assess heritage at various scales: cultural landscape/historic urban landscape, individual properties/architecture and landscape, vegetation and materials components.

The model for the PIN Washington Street resilience and adaptation strategy approach was a multi-year, iterative process with several phases: evocative, catalytic, and transformative. The documentation and assessment of the cultural landscape were multi-scalar ranging from plant species to individual properties and buildings to the historic urban environment. The model utilized and was informed by digital technologies and took into consideration the tangible and intangible aspects of heritage and both large and focused study areas.

CONCLUSION

This paper illustrates UF’s focus on pedagogy for research and design for climate change adaptation, addresses the evolving methodology of each program and the changing relationship of cross-disciplinary design research for the breadth of iterative solution-based thinking for climate change. The case studies highlight potential gaps in disciplinary partnerships and future opportunities to support a broad network of design dialogue that incorporates the local experience of adaptation research.

These courses focused on the power of documentation, assessment, and design to provide hopeful, actionable visions to communities facing dire climate change consequences. In Port St. Joe, not only did the projects provide a valuable opportunity for students and the community, the work itself has continued through further research engagement. In Nantucket, the four site developments and 16 dwelling proposals offered a compelling mix of research, design exploration, and student

desire to make a positive impact for the residents. With PIN, inspired by the 2018 St. Augustine fieldcourse, the Washington Street study employed a cultural landscape approach to help proposed a strategic framework for resilience and adaptation informed by the study area’s history and tangible and intangible heritage.

Our methods for teaching climate change adaptation include learning from practitioners, subject matter experts, student peers and community members; an iterative process of exploration, research and design; a focus on interdisciplinarity, including architecture, landscape, heritage, communication, natural science, social science and policy; and a training of students in community engagement and public interactions. Our projects continue to evolve, including recent collaboration with HBCUs and other design programs across the United States, illustrating the collaborative future of education and practice for adaptation to climate change.

ENDNOTES

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