COLLEGE OF ARCHITECTURE + THE ARTS
Multi-disciplinary Projects for the Built + Designed Environment

Resilient Urbanism Strategies

Mitigation + Adaptation
Energy Efficiency | Monitoring | Benchmarking |
Materials Research | Fabrication
Infrastructure [hard + soft] | Buildings [new + retrofit]

Public Communication + Engagement
Exhibitions | Symposia | Publication | Entrepreneurship

Funding Partners
NSF | DOE | DOE | TIGER | Knight Foundation

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The diagram illustrates the adapted Net-Zero-Energy (NZE) building design, NZE balance line, and benchmarking flow. The images in the frame show some early pioneered and built solar building typologies by Thomas Spiegelhalter and Associates in Southwest Germany, and in the U.S.A. (Image courtesy Thomas Spiegelhalter, 2016.)
Adaptable technologies

Le architetture di Thomas Spiegelhalter
The architecture of Thomas Spiegelhalter

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This grant supports work to lower energy consumption in municipal buildings through the development and implementation of energy efficiency standards and policies.

Three municipalities in South America and the Caribbean were selected: Goiania, Brazil; Valdivia/Los Rios, Chile; Port of Spain in Trinidad and Tobago.

FIU partners with universities in each city: Universidad Federal de Goias (UFG), Universidad Austral de Chile (UACH), and University of the West Indies (UWI)
Rapid Energy Modeling Workflow with Autodesk Software

- Capture
- Calibrate
- Model
- Analyze & Validate

INPUT ROOMS/SPACES/ZONES

3D Wire Frame Model

Digital Photos

Energy and Carbon Analysis

Lights 31.4%
Pumps & Aux 0.1%
Space Heating 0.1%
Space Cooling 14.5%
Fans 15.9%
Exterior Loads 3.3%
Misc Equip 34.7%

Autodesk® Green Building Studio®

Building Energy Model

Autodesk® Revit®
Strategies for Learning: Augmented Reality and Collaborative Problem Solving for Building Sciences

NSF Funding 2015-2017

This Interdisciplinary project integrates Augmented Reality with Building Information Modeling (BIM), visual simulations, and interactive lessons to support collaborative learning among Architects, Engineers and Construction students to improve their capacity to design sustainable and resilient Buildings.
This book is a compendium of existing built works of architecture that demonstrate best practices and principles of designing and constructing buildings that are both environmentally responsible and architecturally expressive. The buildings selected for inclusion in this book exhibit a high level of sustainability and environmental performance and at the same time are complex architectural proposals.

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This book and software are developed to advance the education of climate responsive and ecologically sustainable and resilient building design. It is constructed as an immersive and integrated learning environment, delivering the content in an interactive format.
WEST END
REGIONAL STUDY
Miami Dade County
District 11
CARTA +
Metropolitan Center
Winifred Newman
Kevin Grenier

Partnering for
21st Century Prosperity
University City, A Catalytic Local Project of Regional Significance

Marilys Nepomechi, FIU CARTA, Copyright 2016
Designing for urban runoff mitigation

Landscape design solutions for managing stormwater runoff and protecting against flooding

Ebru Ozer, Associate Professor, LAEUD

8th European Biennial of Landscape Architecture Exhibit, Barcelona, Spain, 2014 | FLASLA Award of Honor in Planning and Analysis Category for Interweaving Wetland, 2014 | FLASLA Award of Merit in Institutional Category for Surface: Campus Green as Stormwater Treatment Laboratory, 2014 | FLASLA Award of Merit in Institutional Category for Reciprocating Landscapes: Wet, Dry, and In Between, 2014

Faculty director: Prof. Ebru Özer - Landscape Architecture and Environmental Urban Design

Students: Gregory Gonzalez, Diego Justiniano, Daniela Menendez, Santiago Olarte, Andrew Pereda, Vanessa Alvarado, Leah Davis, Alfredo Moran, Maria Lopez, Ryan Holmes and Kenia Medina - Landscape Architecture; Monica Ospina - Environmental Studies; Paola Davalos, Natalia Duque, Cynthia Doyon and Andres McEwan - Environmental Engineering; Woby Lang - Sustainability Studies; Kim Moore - Art

Other collaborators: Stuart Grant - Facilities and Planning, Clara M. Kashar and Ryan Vogel - Office of University Sustainability, Prof. Berrin Tansel, Prof. Shonali Laha, Prof. Anna Bemardo-Bricker - Civil and Environmental Engineering
**Permeability + Flooding**

**Permeability Analysis**

- **IMPERVIOUS SURFACES**
  Includes all roads, sidewalks, building footprints, and parking lots.

- **GREEN SPACES**
  Apart from a handful of designed landscapes, these are residual spaces that are simply covered with St. Augustine grass with sparsely spotted trees.

- **BODIES OF WATER**
  All the water bodies are man-made.

- **FLOODED AREAS**
Why not plant forests on the roofs of parking garages?

Trees weigh the same as cars.

Ideas for a Green Miami
Architecture Design Studios

Gray Read
Nick Gelpi

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Ideas for a Green Miami: Architecture Design Studios
Highway as energy farm
Anielka Arguello, 2015

Carbon Footprint:

<table>
<thead>
<tr>
<th>Description</th>
<th>Annual CO₂ Emissions</th>
<th>tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Run</td>
<td>31.3</td>
<td></td>
</tr>
<tr>
<td>Onsite Renewable Potential</td>
<td>-1,130.4</td>
<td></td>
</tr>
<tr>
<td>Natural Ventilation Potential</td>
<td>-2.3</td>
<td></td>
</tr>
<tr>
<td>Onsite Biofuel Use</td>
<td>-0.4</td>
<td></td>
</tr>
<tr>
<td>Net CO₂ Emissions</td>
<td>-1,101.9</td>
<td></td>
</tr>
</tbody>
</table>

Net Large SUV Equivalent: 100.2 SUVs / Year

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Interdisciplinary Collaborations

A COMPARATIVE STUDY IN HISTORIC COASTAL DEVELOPMENT

Miami | La Habana: Magic City | Novia del Mar
Marilys Nepomechie | Marta Canavés
Interdisciplinary Collaborations

MARE NOSTRUM / THE FLOOD: An Installation
International Architecture Biennale Rotterdam
Research + Design Exhibition
IABR and Florida International University Grants

A COMPARATIVE STUDY IN HISTORIC COASTAL DEVELOPMENT
Partnership w/ Tsinghua University | Beijing, China | 5th Place overall: 1st Place Energy Balance + Comfort Zone | 3rd Place Engineering

Marilys Nepomechie, FIU CARTA, Copyright 2016
Designing the Resilient City

Panel Discussion

Thursday, February 12, 6pm-8pm
Coral Gables Museum
285 Aragon Avenue, Coral Gables

Panel Moderators | Exhibition co-curators:
Marilys R. Nepomechie, FAIA
Marta Canavés, ASLA, IIDA

MIAMI 2100:
Envisioning a Resilient Second Century