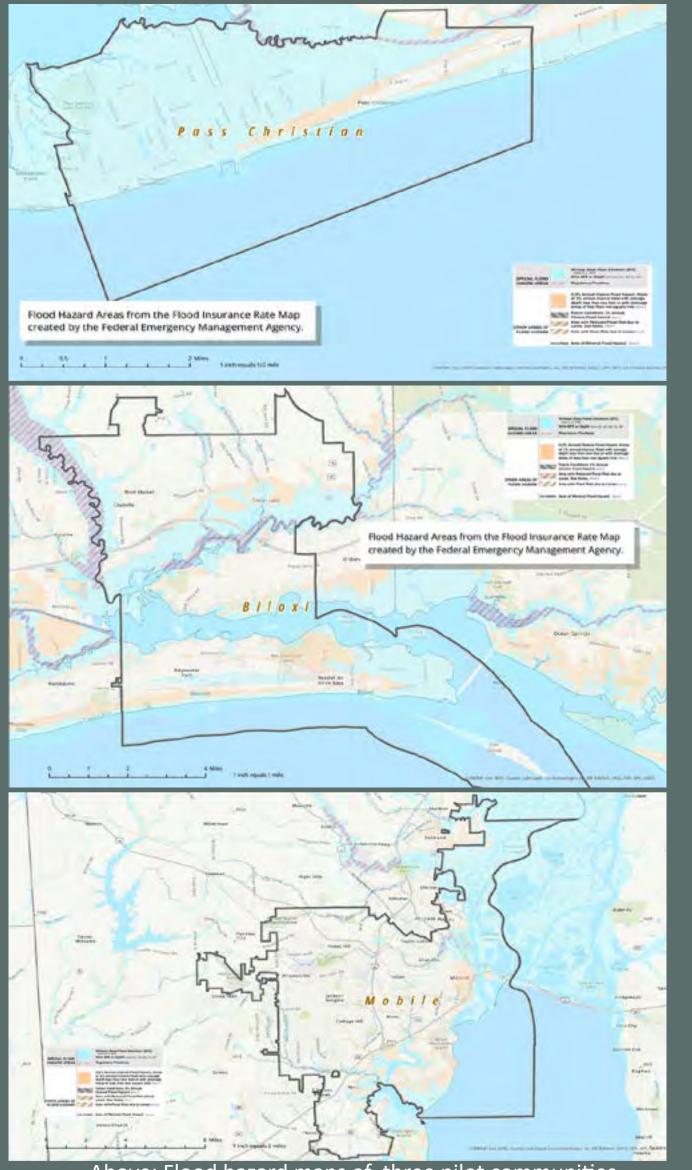
Purpose

The Coastal Hazards Overlay District, funded by the Department of Homeland Security's Office of University Programs, will provide a suite of risk-reduction strategies to help coastal communities address hazards such as hurricanes, coastal erosion, sea-level rise, flooding, and extreme heat.

The Research Team

- Gavin Smith, Ph.D., AICP, Professor, Department of Landscape Architecture and Environmental Planning (LAEP) NC State University
- David Perkes, Professor, School of Architecture, Mississippi State University
- Allison Anderson, FAIA, LEED AP, Principal, Unabridged Architecture
- **Brian Faulk**, Executive Director, Center for Applied Transect Studies, Project for Lean Urbanism
- Ryan Anderson, LEED AP ND, Chitali Biswas, Cassie Nichols, PLA, ASLA, Graduate Research Assistant, Department of LAEP, NC State University

The guide will outline tools that can be used to apply these strategies in conventional Euclidian or New Urbanist form-based zoning and across a range of communities.. The Coastal Hazards Overlay District Guide will provide a suite of risk-reduction strategies for communities to choose from that will reduce the effects of hazards such as floods, storm surge, wind, and erosion. The guide will incorporate strategies that support various adaptation approaches including protect and accommodate, retreat and avoidance, as well as hybrid approaches, allowing for local flexibility. Guidance will be adaptable to each community's local demographic and environmental conditions.



Above: Flood hazard maps of three pilot communities

COASTAL HAZARDS OVERLAY DISTRICT GUIDE

Approach

Background Research

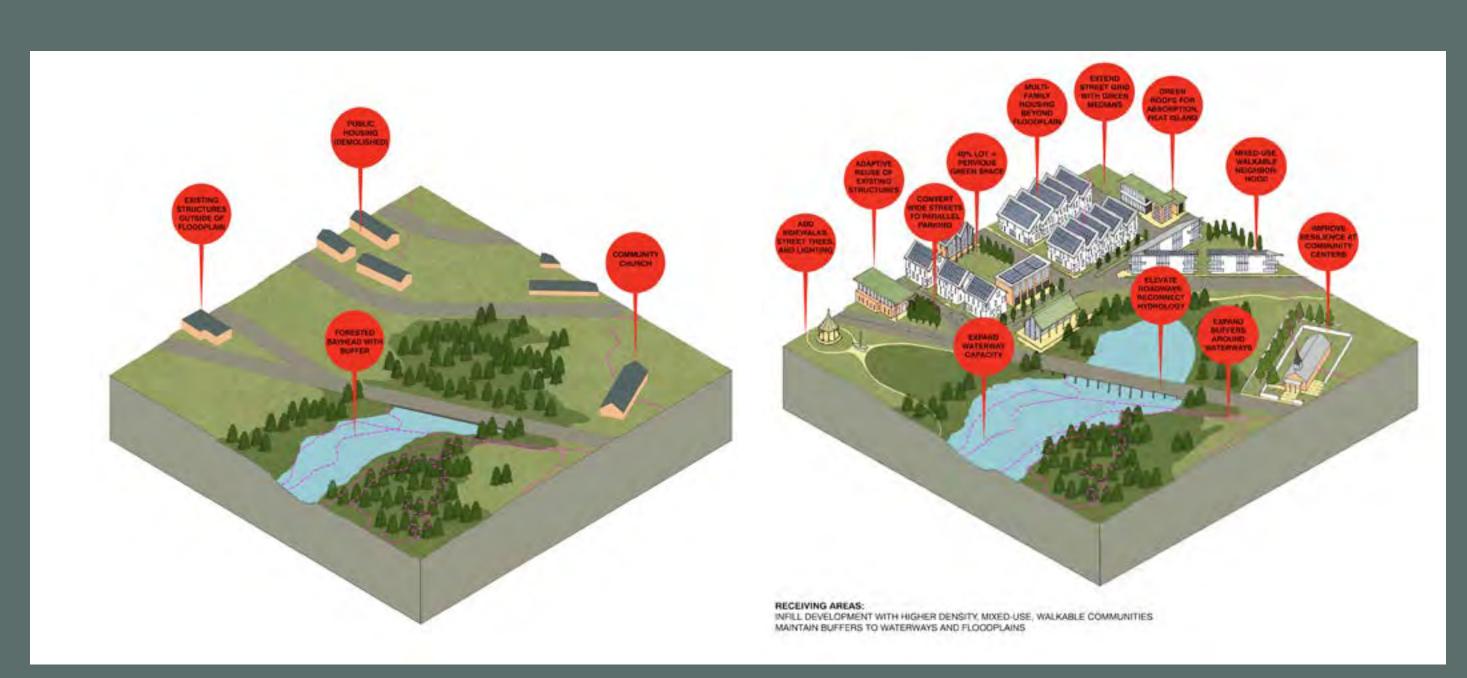
The research team performed an extensive assessment of existing planning documents that addressed climate adaptation throughout the United States. Climate resilient design guidelines were collected from each of the seven coastal FEMA regions in order to explore how municipalities were supporting resilience strategies. Additionally, an assessment of existing overlay districts and how various development requirements could be applied was performed to explore methods of implementing these strategies. These assessments were used to inform preliminary materials that were "ground truthed" in three pilot communities.

Overlay District Matrix

The guide provides a mix of adaptation strategies that build resilience in shoreline (H1), tidal (H2), and riverine (H3) conditions (images right). Adaptation measures were compiled into a matrix of strategies ranging from living shorelines to levees in order to provide a suite of options for building resilience. Tiles illustrating the implementation of proposed adaptation measures were created to visualize the application of these strategies across a range of conditions in the built environment (images below).

Pilot Testing

The participation of these communities included a thorough analysis of demographics, development characteristics, and environmental conditions. Three communities were identified for participation: Biloxi, MS, Pass Chrisitan, MS and Mobile, AL (images left). Participation of these communities consisted of workshops exploring how a Hazard Overlay District could be incorporated into their planning process across a range of scales, allowing the research team to modify the existing concept to ensure its feasibility.



Above: Community Adaptation Tiles showing various resilience strategies (Source: Allison Anderson)

Method

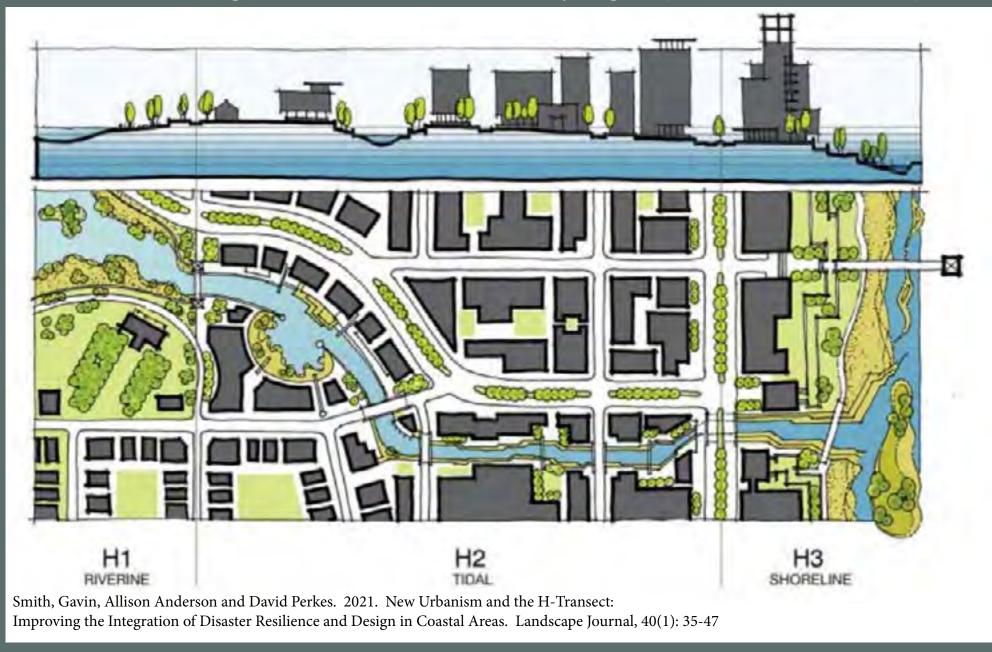
Participation of the pilot communities included engagement in a series of planning workshops, one held in each participating community with city staff and other stakeholders. The goal of the workshops was to develop the Coastal Hazard Overlay District concept with each participating city and consider its geography and the desired building, infrastructure, landscape and site-planning approaches within the defined overlay district. The in-person meetings were used to share information collected by our project team about differing strategies that could be applied in each community and to explore how the Coastal Hazard Overlay District concept fits within the unique local context of coastal hazards, development patterns, and existing plans and policies. Input from each of the cities provided insight regarding what approaches were being used throughout the community (protect and accommodate, managed retreat and avoidance, or a hybrid approach) and what strategies were feasible given the social, environmental, and political conditions in the area. This information will be used to make the Hazard Overlay District document into a flexible tool that will be valuable to a diverse range of communities.



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Above: Managed Retreat and Avoidance Overlay Diagram (Source: Allison Anderson)



Below: Protect and Accomodate Overlay Diagram (Source: Allison Anderson)

Outcomes

- Develop Coastal Hazards Overlay District Framework and Principles
- Create Detailed Design Standards for Coastal Hazards Overlay District Guidebook
- Conduct Background Research on Natural Hazards Overlay Districts
- Identify Managed Retreat/Avoidance & Protect/Accomodate Strategies (Adaptation Matrix) in Urban and Rural Locales
- Ground Truth Overlay District in 3 Coastal Communities (Pass Christian, MS; Biloxi, MS; and Mobile, AL)
- Develop Guidebook, Including Design Standards (50 + techniques) 1 Page Description of each Design Standard
- Share Results with a Range of Design-Based Professional Associations (APA, ASLA, AIA, CNU, Others)
- Conduct Comparative Work with New Zealand, Focusing on Managed Retreat (Applying Coastal Hazards Overlay District Concept in New Zealand).