

SMITH - NCS
DHS Coastal Resilience Center
Year 6 Education Project Workplan
[July 1, 2020 – June 30, 2021]

1. **Title.** Institutionalizing the Graduate Certificate in Disaster Resilient Policy, Engineering and Design
2. **Principal Investigators.** Gavin Smith, Professor, Department of Landscape Architecture. Head of Graduate Certificate in Disaster Resilient Policy, Engineering and Design. North Carolina State University and Andy Fox, Professor and University Faculty Scholar, Director, Coastal Dynamics Design Lab. Department of Landscape Architecture, North Carolina State University.

3. **Other Participants/Partners.**

Travis Klondike, Research Associate Coastal Dynamics Design Lab, Assistant Professor of the Practice, Department of Landscape Architecture, North Carolina State University.

Thomas Barrie, AIA, Professor of Architecture, Director of Affordable Housing and Sustainable Communities Initiative. School of Architecture, North Carolina State University.

David Hill, AIA, Professor and Head of the School of Architecture, North Carolina State University.

Eric Letvin, Deputy Assistant Administrator for Mitigation. Federal Emergency Management Agency.

State Hazard Mitigation Officers across the U.S.

Wendy Saunders, Natural Hazards Planner and Policy Researcher, GNS Science, Lower Hutt, New Zealand.

Steve Dredge, Director, Meridian Urban, Brisbane, Australia.

Local government officials in the United States and abroad dealing with the acquisition of hazard-prone housing. North Carolina partners in Year 5 include Lumberton, Charlotte, and Fair Bluff, North Carolina. Overseas partners include GNS Science, Christchurch New Zealand, Sarah Bevan, University of Canterbury and Meridianurban and Grantham, Australia among others. Additional local partners in Year 6 will include governments drawn from across the United States, New Zealand, and Australia engaged in innovative buyout efforts.

Graduate student team assisting the PI and Co-PI, all of whom are pursuing the graduate certificate in Disaster Resilient Policy, Engineering and Design.

4. **Short Description.**

The project aims to institutionalize the Graduate Certificate Program in Disaster Resilient Policy, Engineering and Design at NC State through interdisciplinary partnerships with faculty as well as federal, state, local and international partners, members of the private sector and graduate students participating in the certificate program. Key tasks designed to achieve this aim include: 1) conducting a design studio in a North Carolina community focused on identifying the best uses of open space post-buyout and development of resilient replacement housing that is located

out of harm's way (the studio course will be incorporated into the certificate program as a six-credit hour elective); and 2) continuing the analysis of the national survey of State Hazard Mitigation Officers and the comparative study of innovative housing acquisition programs in the United States, New Zealand and Australia. All course development and research activities and their associated deliverables will be undertaken in partnership with faculty and graduate students at NC State as well as practitioners at the federal, state, local and international level and the work incorporated into the graduate certificate program, including all core courses. For instance, the interdisciplinary design studio course will be incorporated into the certificate curricula and lessons derived from its development used in the future delivery of this course and other studio-based resilient design courses, thereby expanding the certificate's elective course offerings. Research undertaken in Year 6 will be used in student master's projects, dissertations, and jointly developed journal articles and technical reports that will be provided to FEMA, state division of emergency management agencies, and local governments. Continued partnerships with New Zealand and Australia will serve to further ongoing research, to include international lesson-drawing tied to the development of new and emerging national hazard mitigation and disaster recovery policy in the U.S., New Zealand and Australia. It should be noted that the research literature highlights the underutilization of international lessons drawn from other countries to improve U.S. policy tied to resilience. Among the goals of this part of the Year 6 project is to apply lessons from an emerging New Zealand buyout policy associated with reforms to their Risk Management Act (New Directions for Resource Management in New Zealand: <https://www.mfe.govt.nz/rmreview>) and a state-level disaster resilience initiative in Queensland, Australia (Resilient Queensland 2018-2021) to the new US-based Building Resilient Infrastructure and Communities program. As part of the continuation of Year 5 work, SHMOs will be contacted to identify innovative buyout examples in the US and stakeholders in New Zealand and the Queensland Reconstruction Authority will be contacted to identify innovative buyout programs in their respective countries and interviews will be conducted with buyout administrators using the interview instrument developed and applied in six US and New Zealand communities in Year 5.

5. Abstract.

The year 6 proposal is designed to institutionalize the emerging Graduate Certificate in Disaster Resilient Policy, Engineering and Design (Figure 1). The thirteen-credit graduate certificate includes three core courses (all of which have been developed and the costs associated with teaching them are funded through NC State salaries) totaling 7 credit hours and six credit hours of electives. Students participating in the certificate choose from one of three tracks, including design (hosted by the Landscape Architecture Department), policy (hosted by the Department of Public Administration) and engineering, (hosted by the Department of Civil, Environmental and Construction Engineering). The certificate, which has been approved by each participating department and at the University level, will officially begin in the Fall of 2020. This proposal further codifies the certificate in two ways, including: 1) enhancing the participation of the NC State College of Design faculty and students through expanded partnerships and 2) building on strong partnerships with FEMA's Federal Insurance and Mitigation Administration (FIMA) office; State Hazard Mitigation Officers; local communities throughout the State of North Carolina, across the United States, and in New Zealand and Australia; and ; GNS Science, a quasi-governmental partner in New Zealand, and Meridianurban, a private sector firm that works closely with the Queensland Reconstruction Authority. A key theme of Year 6 work is to embed the issues surrounding the relocation and resettlement of hazard-prone housing into the

certificate program with an aim to develop a nationally and internationally recognized certificate program that appeals to prospective students and practitioners who seek to gain a deeper understanding of what is a highly complex process and one that is rapidly gaining global attention in an era of climate change.

Specific Year 6 activities include: 1) creating and teaching an interdisciplinary design studio focused on key post-disaster housing acquisition challenges in a North Carolina community that can serve as a model for resilience-related studio courses at NC State that will be incorporated into the Graduate Certificate curricula, and 2) continuing the comparative assessment of housing relocation efforts in the United States, New Zealand and Australia as well as the ongoing analysis of a new dataset of State Hazard Mitigation Officers created in Year 5. All products (including resilient studio course development techniques and research findings) will be incorporated into the certificate program curricula and used by students participating in the program to assist the PI generate journal articles, book chapters, and technical reports. Students pursuing the certificate will also use the datasets to generate master's theses and dissertations. In addition, the design studio development and implementation procedures and associated coursework will be used to improve upon issues uncovered in a prior study led by the PI of this project which assessed the state of disaster resilient design education at US universities (in Year 4). The results of the continued analysis of buyouts and the national survey of State Hazard Mitigation Officers will be incorporated into existing certificate courses, reports for FEMA, states, and local governments, and journal articles, some of which will be led by graduate students and supervised by the PI.