

**SMITH, UNC**  
**DHS Coastal Resilience Center**  
**Education Project:**  
**Annual Project Performance Report**

Covers reporting period January 1, 2016 – June 30, 2016

1. **Project Title:** Expanding Coastal Resilience Education at UNC
  
2. **Principal Investigator / Institution:** Gavin Smith, Director, Coastal Resilience Center of Excellence; Research Professor, Department of City and Regional Planning. Rick Luetlich, Professor, Department of Marine Sciences, University of North Carolina at Chapel Hill.
  
3. **Other Education Participants/Partners:** UNC Departments of Marine Sciences, City and Regional Planning, Geological Sciences, Law School, Center for Public Service

4. **Short Project Description:**

UNC has significantly expand its capabilities in Coastal Resilience by developing a graduate certificate program in Natural Hazards Resilience and by hiring a tenure track faculty member (trained in physical science and/or engineering) in the area of Coastal Natural Hazards and Climate Science. The Certificate program, which started in the Fall of 2015, focuses on the nexus between the physical science underlying natural hazards phenomena and the policies, programs, and plans needed to help societies manage their effects and increase resilience. The faculty position will initially be 2/3 funded by UNC and 1/3 by the CRC. At the end of the CRC's fifth year, the faculty position will become fully funded by UNC to provide a long-term programmatic contribution to the Homeland Security enterprise.

5. **Abstract:**

The 10-hour credit Natural Hazards Resilience certificate program focuses on the nexus between the threats and impacts of natural hazards and disasters on human settlements, including those exacerbated by climate change, and how individuals, organizations, communities, and larger systems of governance prepare for, respond to, mitigate against, recover from, and adapt to these events. Emphasis is placed on the concept of disaster resilience, or "the ability to prepare and plan for, absorb, recover from, and more successfully adapt to adverse events" (National Research Council 2012). The curriculum provides students with an academic and practice-based exposure to the science underlying our understanding of natural hazards phenomena and a critical analysis of the policies, programs, and plans in place that are intended to help societies manage the effects of natural hazards and disasters, to include a discussion of those actions that effect disaster resilience. The certificate program is designed to serve enrolled graduate students and is not available to

practicing professionals located outside the university. Based on the high demand among employers for recent graduates who have studied with faculty associated with the former Coastal Hazards Center, we believe the certificate program will provide a significant enhancement to participating students' graduate education and competitiveness in the job market.

## **6. End users:**

Key "end users" of the program are our students. The certificate program is open to master's and Ph.D. students from all departments at UNC-CH that have identified an advisor in their home department that is willing to work with the head of the certificate program or an advisor that is actively participating in the certificate program. A Program Director (Gavin Smith) and Certificate Coordinating Committee - comprised of one representative from the Department of City and Regional Planning (Nikhil Kaza), the CRC (Rick Luettich); the Law School (Don Hornstein); The Department of Public Policy (Pam Jagger), the Department of Marine Sciences (to be determined), the Department of Geological Sciences (Laura Moore); Carolina Center for Public Service (Lynn Blanchard); a student representative currently enrolled in the program (to be determined on a bi-annual basis); and one non-UNC-CH hazards scholar will review applications for admission. The Program Director and Certificate Coordinating Committee will also be responsible for assessing other certificate compliance issues, such as course credits, the transfer of courses from other universities (if applicable), the appropriateness of fieldwork or student internships, the possible creation of on-line courses, or other issues that may arise. In addition, students will create a student group in the Fall of the second year of the Certificate Program. This will allow for additional connectivity with practitioners through field trips, invited guest speakers, and assisting with post-disaster recovery efforts.

Additional end users are those that stand to gain from a trained pool of graduates. DHS constituent agency representatives (e.g., FEMA, US Coast Guard) other federal agencies (e.g., NOAA, US Army Corps of Engineers, US Geological Survey), professional associations (e.g., American Planning Association, Association of State Floodplain Manager's) and CRC Advisory Board members play an important role in the certificate program in a number of ways, including: 1) serving as invited guest speakers in courses, 2) hosting student interns as identified, 3) providing feedback on course content, and 4) notifying the Program Director of available job postings. Given the certificate's focus on disaster recovery and hazard mitigation, Matt Campbell (FEMA Disaster Recovery - Community Planning and Capacity Building) and Kathleen Smith (FEMA Hazard Mitigation – Planning Lead) will serve as federal agency end user contacts. They will advise on course content, conduct class lectures, and assist in the identification of internship and job opportunities). Both have served in this capacity for the last two years prior to the official start of the certificate program in the Fall of 2015.

End users have played a major role by serving as lecturer's in all classes. This is particularly the case in the certificate's speaker series course. The list of Spring speakers include:

- 1) William H. Hooke – Associate Executive Director and Senior Policy Fellow, American Meteorological Society. Author of *Living on the Real World: How Thinking and Acting Like Meteorologists Will Help Save the Planet* (CRC Advisory Board).
- 2) Tom Birkland – William T. Kretzer Professor of Public Policy, School of Public and International Affairs, North Carolina State University.
- 3) Barry Keim (via Skype) – Richard J. Russell Professor, Louisiana State University, State Climatologist (CRC PI).
- 4) Craig Fugate - W. Craig Fugate Administrator of the Federal Emergency Management Agency (FEMA).
- 5) David Perkes – Gulf Coast Community Design Studio, Professor Mississippi State University of Art + Architecture. David Perkes is an architect and Associate Professor at Mississippi State University. He is the founding director of the Gulf Coast Community Design Studio, a professional outreach program of the College of Architecture, Art + Design.
- 6) Carl Bruch, Senior Attorney; Co-Director, International Programs, Environmental Law Institute.
- 7) Pam Rubinoff is a Senior Coastal Manager at the Coastal Resources Center where she works with U.S. and international partners to build capacity, create policy and provide technical assistance in Latin America, Southeast Asia, the Marshall Islands and Rhode Island (CRC researcher).
- 8) Dennis Wenger – Former Program Director, Infrastructure Systems Management and Extreme Events, National Science Foundation.
- 9) Gerald E. Galloway - is a Glenn L. Martin Institute Professor of Engineering with the Department of Civil and Environmental Engineering and an Affiliate Professor in the School of Public Policy, at the University of Maryland.

## **7. Explanation of Changes:**

The changes noted here are more accurately characterized as the natural expansion of the Natural Hazards Resilience Certificate Program and are indicative of how the certificate is being used to leverage other ideas and resources.

Students have suggested that the Lecture Series course, which is currently a 1 credit hour course, should be expanded to two hours in order to provide additional time for speakers and students to interact. This is a good development in that students see the merits of lengthening the course. The Lecture Series course may be expanded to 2 hours in the future.

The Career Development Grant (CDG), now called the Career and Workforce Development Grant (CWFDG) has been more closely linked to the Certificate in that students receiving the grant agree to pursue the certificate. This was not explicitly stated in the original workplan. Both 2016 recipients of the CWFDG are pursuing the certificate (as are/did the CDG grant recipients).

Students have developed a listserv called triangle resilience as a means to keep students and researchers interested in natural hazards resilience abreast of relevant activities in the region and beyond. Starting in the Fall of 2016, students are using the listserv as a catalyst for the creation of a student group. Activities being considered include hosting nationally recognized speakers, conducting post-disaster community service, conducting field trips or other activities as identified.

Classes have been supplemented by field trips, including one to Kinston, NC (Spring 2016) and Charlotte NC (Fall 2016). This is planned to be a regular occurrence in future classes.

Additional Leveraged Activities: Two activities have evolved as a result of the Certificate.

- I. Additional classes taught during the workplan timeframe:
  - 1) Independent Study: *The Role of States in Disaster Recovery* (3 hours) – (Spring 2016)
  - 2) Independent Study: *Building Resilience to Coastal Hazards in Hawai'i: Strengthening the Post-Disaster Recovery Process* (2.5 hours) – (Summer 2016)
  - 3) Venice International University in Partnership with Duke University. *Environmental Management in a Changing World: Coping with Sea Level Rise* (Summer 2016 – one-week summer course in Venice, Italy).
  
- II. International Learning Laboratory Concept: The field trip to Kinston has led to the possible creation of a “learning laboratory” in eastern North Carolina where faculty and students can come to study and learn from the many unique features found here including large-scale investments in hazard mitigation, the implementation of major disaster recovery projects and the inherent dynamism of the region, including its barrier islands. This concept has fostered a larger effort to develop other learning laboratories overseas. Potential areas include: 1) Australia (the CRC Director will visit Australia in August 2016 to discuss this concept and build on partnerships with the Natural Hazards Resilience and Bushfire CRC and other universities in Australia, namely RMIT and Macquarie University), 2) Vietnam (The CRC Director may visit Vietnam in December 2016 to discuss this concept and build on this concept with UNC colleague Dr. Mai Nguyen who has already established a two-year agreement with Vietnamese universities and the national government), and 3) Venice, Italy (building on partnerships established this summer while teaching at Venice International University).

## **8. Unanticipated Problems:**

A primary challenge includes identifying appropriate supporting faculty and staff to assist with student mentoring, the co-funding of invited speakers, and the teaching of certificate classes. Given that the PI of this project is assuming the majority of getting the certificate established, this has been extremely time consuming.

The administrative challenges are being addressed by: 1) the hiring of a new faculty position who will assist in the teaching of certificate classes, 2) reaching out to DCRP faculty that can mentor or co-mentor students who are interested in studying natural hazards resilience-related topics and are pursuing the certificate, and 3) working more closely with certificate committee members to include getting them to support incoming speakers, conduct guest lectures, and teach certificate elective courses. Specific faculty members who are assisting in these efforts include Don Hornstein and Laura Moore (conducting class lectures), Mai Nguyen (co-mentoring certificate students), and Laura Moore (teaching certificate electives), and Danielle Spurlock (co-teaching Independent Study with student pursuing certificate). These challenges will be addressed through the development of a Faculty Fellows program that is scheduled to begin in the Winter of 2016.

## **9. Project Outcomes:**

The project has accomplished the following: 1) created an Advisory Committee; 2) Received Certificate approval by the University Administration; 3) Developed and delivered all three courses scheduled (e.g., Planning for Natural Hazards and Climate Change Adaptation, Survey of Natural Hazards and Disasters, and the Lecture Series plus an Independent Study course); 3) Recruited and hired a new faculty member; 4) assisted three students obtain summer internships; 4) recruited seven new students to the Certificate Program, and 5) initiated the development of a Natural Hazards Resilience Student Group. Each of these accomplishments are necessary foundational elements that will help build a program that will graduate well educated students.

Our first Certificate recipient graduated this summer and is in the process of seeking employment (she was hired by the North Carolina Division of Emergency Management to assist with housing recovery following Hurricane Matthew after the close of the CRC reporting period). This follows her summer internship with the Maui County, Hawaii and Hawaii Sea Grant. Two other students participating in the certificate program had summer internships, including one with the US Department of the Interior and one with a private sector firm. The latter example was offered a part-time job with the firm in which she interned while she completes her master's degree.

The Certificate has gained increased recognition at UNC, particularly among prospective and incoming students in the Department of City and Regional Planning. Six new students stated in their application that the reason they wanted to come to UNC was to study natural hazards and disasters and pursue the Graduate Certificate in Natural Hazards Resilience (two additional students from Duke University have applied as well). This is a significant achievement as the certificate is now widely recognized by students applying to one of the most prestigious planning programs in the country. As part of the Certificate Program, guest speakers are invited to discuss key topical areas and discuss career opportunities and those skills that appeal to them when they recruit new hires. This interaction between students and practitioners is a regular part of the program and provides a unique opportunity for students to query those that are looking for new

graduates. As mentioned earlier, Matt Campbell and Kathleen Smith from FEMA, as well as a number of other practitioners have agreed to assist in the identification of job openings and their feedback on class materials helps to educate students on those aspects of resilience that are important in the marketplace. Both officials regularly provide notice of job positions as they are posted.

Additional evidence of the certificate’s growing maturity is the formation of a student group, scheduled to begin in the Fall of 2016. This group will bring in additional speakers and may include: 1) hosting of job fairs for those who seek new graduates in this rapidly growing field, 2) hosting guest speakers, 3) participating in post-disaster assistance activities, and 4) the creation of a student-led workshop where students will present the research they are engaged in with the CRC and other organizations.

**10. Education Activity and Milestone Progress:**

**Education Activities and Milestones: Progress to Date**

<b>Reporting Period 1/1/2016 – 6/30/2016</b>			
<b><u>Education Activity</u></b>	<b><u>Proposed Completion Date</u></b>	<b><u>% Complete</u></b>	<b><u>Explanation of why activity / milestone was not reached, and when completion is expected</u></b>
Recruit tenure track faculty member (trained in physical science and/or engineering) in the area of Coastal Natural Hazards and Climate Science	January 2016	100%	
Recruit students into certificate program	June 2016	100%	
Teach two Spring semester core courses	June 2016	100+% (Taught 3 Spring semester classes, including two core and one Independent Study)	
<b><u>Education Milestone</u></b>			
Tenure track faculty member hired	June 2016	100%	

Six students admitted to certificate program	June 2016	70%	Four new certificate program applicants have applied and will be vetted by the Certificate Review Committee in the Fall of 2016. Others beginning in the Fall of 2016 will be encouraged to apply as they noted this on their application to UNC's Department of City and Regional Planning. At this point it appears that 3 or more additional students are going to apply for the certificate following Fall orientation which was held in August 2016. Note: 7 students applied during Fall 2016 term.
Survey of Natural Hazards and Disasters and Lecture Series courses taught	June 2016	100%	
Track student performance (including first graduate(s)) – some students will have completed required coursework as 2 core courses were offered before certificate was approved.	June 2016	100% (First certificate program student graduated in the summer of 2016)	

## 11. Transition Activity and Milestone Progress:

### Transition Activities and Milestones: Progress to Date

Reporting Period 1/1/2016 – 6/30/2016			
<u>Transition Activity</u>	<u>Proposed Completion Date</u>	<u>% Complete</u>	<u>Explanation of why activity / milestone was not reached, and when completion is expected</u>
Promote internship opportunities for students/recruit end users to host students	January 2016	100% (2016 Summer internships included Maui County Hawaii and HI Sea Grant; US Department of the Interior; AMEC Consulting. Internship	

		opportunities posted on triangle resilience listserv.	
Promote certificate program graduates to potential employers	June 2016	100% (Promotion strategy includes inviting prospective employers to serve as class lecturers)	
<b>Transition Milestone</b>			
Establish a list of potential employers and secure commitments from them to support internships	June 2016	100% List of employers is an ongoing process and represents employers in the public (FEMA, NOAA, USACE), private (URS, AECOM, etc.), and others as identified.	

## 12. Interactions with research projects:

The following CRC PI's have lectured or will lecture in certificate classes: 1) Barry Keim – Spring 2016; 2) Brian Blanton Spring 2016, 3) Pam Rubinoff (Spring 2016), 4) Jeff Carney Fall 2016.

Note: the following CRC Advisory Board Members have lectured in certificate classes: 1) Ellis Stanley (Spring 2016), 2) William Hooke (Spring 2016). The following Certificate Committee Members have lectured in certificate classes: 1) Don Hornstein (Spring 2016), 2) Laura Moore (Spring 2016).

Research findings associated with the CRC- and FEMA-funded Role of States in Recovery project has been incorporated into class lectures to include the use of a training video on this topic. Research findings tied to the national evaluation of hazard mitigation plans (funded through the Coastal Hazards Center) has also been incorporated into classroom lectures. Research findings of other CRC PI's have been presented-see Keim, Blanton, Rubinoff, and Carney.

**13. Publications (including journal article, training guide and training video):**

Gavin Smith, Lea Sabbag and Ashton Rohmer. A Comparative Analysis of the Roles Governors Play in Disaster Recovery (submitted for review-Spring 2016).  
 Smith, Gavin, Lea Sabbag, Ashton Rohmer. Role of States in Recovery Video Training Guide. March 2016. Chapel Hill, North Carolina: Department of Homeland Security, Coastal Resilience Center of Excellence.  
 Smith, Gavin. March 2016. Role of States in Disaster Recovery Video. Produced by Horizon Video Productions, Durham North Carolina. (30 minutes).

**14. CRC Performance Metrics:**

<b>CRC Performance Metrics</b>			
<b>Metric</b>	<b>Research</b>	<b>Education</b>	<b>Center</b>
Courses/certificates developed, taught, and/or modified		See Table	
Enrollments in Center-supported courses/certificates			
HS-related internships (number)		2	
Undergraduates provided tuition/fee support (number)			
Undergraduate students provided stipends (number)			
Graduate students provided tuition/fee support (number)		2	
Graduate students provided stipends (number)			
Undergraduates who received HS-related degrees (number)			
Graduate students who received HS-related degrees			
Certificates awarded (number)		1	
Graduates who obtained HS-related employment (number)		1	
SUMREX program students hosted (number)			
Lectures/presentations/seminars at Center partners			
DHS MSI Summer Research Teams hosted (number)			
Journal articles submitted (number)		1	
Journal articles published (number)			
Conference presentations made (number)		6	
Other presentations, interviews, etc. (number)			
Patent applications filed (number)			
Patents awarded (number)			
Trademarks/copyrights filed (number)			
Requests for assistance/advice from DHS agencies (number)			
Requests for assistance/advice from other international, Federal or state agencies state/local governments (number)			4
Total milestones for reporting period (number)			
Accomplished fully (number)		9	
Accomplished partially (number)		1 (see above)	
Not accomplished (number)			
Product/s delivered to end-user/s (description and	See Table		

External funding received	See Table		
Leveraged support			
Articles on Center-related work published on website			
Coverage in media, blogs (number)			
Social media followers (number)			
Posts to social media accounts (number)			
Events hosted (number)			
Website hits (number)			

Table for Documenting CRC Education Project Courses and Enrollments

Courses Developed and Taught by University of North Carolina at Chapel Hill under Project Natural Hazards						
Course		Developed (D), Revised (R), and/or Taught				
Number	Title	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
PLAN 754	Natural Hazards Resilience Speaker Series	D/T				
	Offering: Elective (E), Certificate (C), Minor (M)	C				
	Enrollment	15				
PLAN 756	Survey of Natural Hazards and Disasters	D/T				
	Offering: Elective (E), Certificate (C), Minor (M)	C				
	Enrollment	14				
PLAN	Independent Study: The Role of States in Disaster	D/T				
	Offering: Elective (E), Certificate (C), Minor (M)	C				
	Enrollment	1				
PLAN	Independent Study: Building Resilience to Coastal					
	Offering: Elective (E), Certificate (C), Minor (M)	C				
	Enrollment	1				

Table for Documenting External Funding and Leveraged Support

External Funding			
Title	PI	Total Amount	Source
N/A			
Leveraged Support			
Description			Estimated Annual
N/A			