

**SMITH, UNC-CH  
DHS COASTAL RESILIENCE CENTER  
EDUCATION PROJECT  
YEAR 3 REPORT  
July 1, 2017 – June 30, 2018**

Project Title: Expanding Coastal Resilience Education at UNC - University of North Carolina

Principal Investigator Name/Institution:

Gavin Smith, Research Professor, Department of City and Regional Planning  
Rick Luettich, Professor, Department of Marine Sciences, University of North Carolina at Chapel Hill

Other Partners/Institutions:

UNC partners include: Departments of City and Regional Planning, Geological Sciences, Law School, Curriculum for the Environment and Ecology, of Marine Sciences, Center for Public Service. North Carolina State University partners include the Departments of Landscape Architecture and Architecture in the College of Design. State partners include the North Carolina Division of Emergency Management and North Carolina Governor's Office. Federal partners include FEMA's Community Planning and Capacity Building team. Additional local partners include: local officials and residents in the towns of Princeville, Windsor, Kinston, Seven Springs, Lumberton and Fair Bluff, North Carolina (communities represent many of the most hard-hit locations following Hurricane Matthew that possess limited capacity to recover).

Project Start and End Dates: 1/1/2016—6/30/2020

Short Project Description ("elevator speech"):

UNC has expanded its capabilities in Coastal Resilience by developing a graduate certificate program in Natural Hazards Resilience and by hiring a tenure track faculty member in the area of Coastal Natural Hazards and Climate Science.

The 10-hour certificate program 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. Key themes explored include the role of planning, governance, and the connectivity between natural hazards, disasters, and climate change adaptation.

The certificate program has further expanded through a partnership with the North Carolina Division of Emergency Management following Hurricane Matthew. At the request of the Director of NCEM and support from the Governor's Office, Dr. Smith created the Hurricane Matthew Disaster Recovery and Resilience Initiative (HMDRRI). HMDRRI is designed to assist 6 heavily impacted communities following Hurricane Matthew, which struck North Carolina in the Fall of 2016. The HMDRRI provides a rare opportunity for students and faculty to engage with seasoned practitioners and local jurisdictions in post-disaster recovery operations following Hurricane Matthew and subsequent events.

## **PROJECT NARRATIVE:**

1. Introduction and project overview: *Describe the specific education need that your project addressed, including its relevance to the DHS mission.*

The study of natural hazards resilience, including those hazards exacerbated by a changing climate, and the translation of these findings to practice is becoming increasingly important as disaster losses continue to rise at an exponential rate in the United States and across the world. The Department of Homeland Security's Science and Technology Directorate, Office of University Programs, the National Science Foundation, and the National Academy of Sciences have all expressed their concerns about this growing trend. A common refrain among all groups is the need to educate the next generation of natural hazards scholars and practitioners as the field is greying and is less diverse than the population as a whole.

The 10-hour certificate program based at UNC offers a recognized value in the field as evidenced by an increased emphasis on professional training and certification among individuals and organizations. The activities also align with Quadrennial Homeland Security Report Goal 1.3 (manage risks to critical infrastructure), Mission 5 (ensuring resilience to disasters) and all of its associated goals (mitigate hazards, enhance preparedness, ensure effective emergency response, and rapid recovery). The certificate program is building important capacity by attracting and training the next generation of natural hazards scholars and practitioners. The value of the program is evident in the fact that all graduates of the program have gone on to work in the field or are pursuing further educational opportunities focused on natural hazards, disasters and climate change adaptation.

Coupling the certificate program with the university's national recognition for academic excellence is intended to provide a multi-disciplinary pool of graduate students with a unique learning opportunity, sense of community, and highly competitive set of skills and knowledge base that blends what we know about natural hazards and disasters with climate change (including adaptation). This is being further supplemented by the research and engagement opportunities offered to students through initiatives like that found in the Hurricane Matthew Disaster Recovery and Resilience Initiative (HMDRRI). Additional opportunities are being explored through post-Hurricane Florence work and informed by the recently completed study by the PI and Dr. Mai Nguyen that assessed the state of disaster resilient design curricula in the United States and offered specific recommendations on how to improve it.

2. History: *Provide a brief history of your project (chronological progression of activity). Include a description of how you engaged end users in your project. What challenges did your project face and how were they handled?*

### **Natural Hazards Resilience Certificate Program**

The Graduate Certificate Program in Natural Hazards Resilience was approved by UNC-CH in the fall of 2015. Although the process of getting approval was lengthy and challenging, the certificate program has proven to be very successful as indicated by increased enrollment, growing interest expressed by new students entering graduate programs at a variety of

departments at UNC, and the increase in the number of students achieving the certificate within the two-year timeframe.

Students must apply to the certificate program. Upon acceptance, students are required to take and pass 10 credit hours, including three core courses (Planning for Natural Hazards and Climate Change Adaptation (3 credits); Survey of Natural Hazards and Disasters (3 credits); and Natural Hazards Resilience Speakers Series Course (1 credit). The remaining 3 credit hours are acquired through approved elective courses in a wide variety of disciplines, including geography, geology, marine science, law, public administration, and social work, among others. Students are strongly encouraged to gain experience through summer internships and/or fieldwork.

The Natural Hazards Resilience Speaker Series was launched as part of the certificate program in the Spring semester of 2016, and has proven to be very popular as evidenced by growing enrollment each time it is offered, including attendance by students and others who are not seeking the certificate. The talks have centered on topics related to natural hazards resilience, but each invited speaker has brought their own unique perspective and experiences to the classroom. In the most recent speaker series offering, topics of discussion included the impacts of Hurricane Maria in Puerto Rico; a professional photographer's perspective on art and disaster; creating wildfire resilient communities; and disaster recovery in a small town, among others. The highlight of the Spring 2018 speaker series was a visit to UNC's campus by FEMA Administrator Brock Long. Administrator Long spoke about lessons learned from the 2017 hurricane season and offered a vision for emergency management moving forward. The Administrator's talk, which was followed by a Q&A session, was attended by students, faculty, community members, and local and state elected officials. Former FEMA Administrator Craig Fugate also spoke in the previous year's class.

#### New Faculty Hire in Marine Science

In 2015, Dr. Wei Mei was hired at the UNC Department of Marine Sciences as a tenure track faculty member. Dr. Wei, whose specialty is in climate and coastal hazards, conducts internationally recognized research that is closely aligned with the CRC. Specifically, he studies tropical cyclones with a focus on interactions with the ocean and climate control, and is also interested in atmospheric, ocean and climate dynamics, and climate variability, extremes and change. During years 2-5 of the CRC grant, 1/3 of the faculty position is funded by DHS through the CRC; 1/3 funding is provided by the UNC Vice Chancellor for Research; and 1/3 comes from the College of Arts & Sciences.

#### Hurricane Matthew Disaster Recovery and Resilience Initiative

Following Hurricane Matthew, which heavily impacted much of the eastern portion of the state in 2016, the NC Division of Emergency Management and the Governor's Office requested assistance from Dr. Gavin Smith to serve as a Senior Recovery Advisor and Chief of the Hurricane Matthew Disaster Recovery and Resilience Initiative (HMDRRI). This role involved advising the North Carolina Division of Emergency Management (NCEM), the Governor, and members of his cabinet on a range of disaster recovery policy issues. Key issues included helping the state develop a disaster recovery housing strategy, advising the state on the allocation and coordination of funding, the identification of unmet local needs, and developing strategies focused on assisting local governments and disaster survivors to recover from one of the worst

disasters in the state's history. Emphasis was placed on providing assistance not typically addressed by FEMA or state agencies. Based on meetings with local officials to identify unmet needs, the HMDRRI team focused on helping communities with a number of activities. These included: 1) identifying what could be done with the open space following the acquisition and demolition of flood-prone homes; 2) conducting land suitability analyses to identify areas outside the floodplain, but within each town's boundaries where replacement housing could be built (thereby reducing the loss of tax base); 3) designing several housing replacement design plans; 4) conducting a housing study to assess housing needs by type, cost and location; 5) conducting studies assessing possible floodproofing strategies in historic downtowns; and 6) developing disaster recovery plans. In addition, the HMDRRI team led the 5-day Princeville Design Workshop, which involved collaborating with the North Carolina Division of Emergency Management, the North Carolina State University College of Design, over 20 state and federal agencies, local officials, and the residents of Princeville, North Carolina, the oldest African American community in the United States. Emphasis was placed on creating design options for a 52-acre site outside the floodplain adjacent to the town limits to relocate critical public facilities, construct new replacement housing, and explore the creation of a visitor's center.

#### NCSU Design Week

Under the auspices of HMDRRI, in the Fall of 2017 the North Carolina State University College of Design held Design Week in which teams made up of UNC Department of City and Regional Planning students along with students from the Departments of Architecture and Landscape Architecture at North Carolina State University's College of Design developed design-based solutions for 4 of the 6 HMDRRI communities. In total, more than 30 students participated in the design competition. Students met with officials in their respective communities, developed proposed solutions and presented their findings to a panel of NCSU and UNC faculty as well as representatives from the communities. The winning project sought to inform how communities slated for the purchase and demolition of their homes could be relocated as a group, thereby maintaining a sense of community. The project has resulted in influencing how the expenditure of several hundred million dollars in post-disaster aid may be allocated. The results have also helped to inform the development of a relocation strategy implemented by the HMDRRI team in the 6 communities.

#### Homeplace: Conversation Guides for Six Communities Rebuilding from Hurricane Matthew

In 2017, the Coastal Dynamics Design Lab at North Carolina State University College of Design led the development of conversation guides to assist flood survivors by providing easy-to-understand technical assistance addressing typical post-disaster issues. The *Homeplace* documents provide residents of the six HMDRRI communities with a menu of high-quality, community-specific designs and strategies that consider broader regional infrastructures, development patterns, and population trends. The ultimate goal is to build the local capacity of North Carolina's flood-prone communities, providing them with design, planning, and policy strategies and tools to promote the long-term function, health, and vitality of their residents and neighborhoods. Specific guidance emphasized how to use the open space created following the acquisition of flood-prone homes (e.g., pocket parks, greenways, community gardens, public spaces) and creating eight replacement housing prototype designs that reflected the local vernacular of impacted communities. The recommendations in each of the six community-specific guides are currently being woven into the communities' recovery plans.

## Disasters Design Education in the United States: Current and Emerging Curricula in Colleges and Universities

Under a 2016 federal action in the Obama administration that recognized the role of resilient design education to promote a resilient future, CRC, led by Dr. Gavin Smith and Dr. Mai Nguyen conducted a study of resilient design education in the United States. The project included a literature review and landscape survey by the CRC to establish the current state-of-the-art in the science and education of resilient design. The research involved an extensive internet search of resilient design curricula, key informant interviews with experts, consultation with a review committee, and case studies of resilient design education programs. The study examined five design-based disciplines, including architecture, building sciences, engineering, landscape architecture, and planning.

The study found that resilient design is a small but rapidly growing field, with several universities and colleges creating degrees, minors and certificate programs focusing on the subject. However, the findings also indicate that many programs remain focused on one element of resilient design instead of encouraging interdisciplinary approaches. The report identified several goals to improve the availability of interdisciplinary resilient design education in the United States. Resilient Design Education Goals include:

- Improve institutional commitment from colleges and universities across disciplines and departments.
- Develop new curricula models and organizational structures to emphasize opportunities for research and engagement, beyond classroom learning.
- Build interdisciplinary teams with a mix of faculty, practitioners and policy-makers to teach and mentor students.
- Emphasize field and studio-based projects for a “learning by doing” approach to foster innovation, room to fail, and the ability to fix problems.
- Create flexible and responsive curricula for post-disaster situations, which provide many learning opportunities and opportunities for field work.
- Seek out national, state, and local stakeholders that could serve as ongoing “clients” or sounding board for curriculum content and products developed by students and faculty.

The findings of this study will be incorporated into ongoing efforts to improve the Graduate Certificate in Natural Hazards Resilience. For instance, FEMA’s Higher Education Program has funded the development of a new 3 credit hour course in Disaster Resilient Design to be created by Dr. Smith that will be added as an elective in the certificate program in 2019.

3. *Results: Describe your final results, including courses/programs/certificates/degrees, etc. developed and given.*

The following courses were developed and have been delivered as part of the natural hazards resilience certificate program:

<b>Natural Hazards Resilience Certificate Course Delivery</b>			
<b>Semester</b>	<b>Course Title</b>	<b>Course #</b>	<b>Student Enrollment</b>
Spring 2015	Special Topics Seminar	(PL 90)	5
Fall 2015	Planning for Natural Hazards and Climate Change Adaptation	(PL 755)	8
Spring 2016	Natural Hazards Resilience Speaker Series	(PL 754)	14
Spring 2016	Survey of Natural Hazards and Disasters	(PL756)	9
Spring 2016	Independent Study	(PL 896)	1
Fall 2016	Planning for Natural Hazards and Climate Change Adaptation	(PL 755)	20
Spring 2017	Natural Hazards Resilience Speaker Series	(PL 754)	31
Spring 2017	Masters (non-thesis)	(PL 992)	4
Summer 2017	Masters (non-thesis)	(PL 992)	1
Fall 2017	Survey of Natural Hazards and Disasters	(PL756)	26
Spring 2018	Natural Hazards Resilience Speaker Series	(PL 754)	28
Spring 2018	Masters (non-thesis)	(PL 992)	3
Fall 2018	Planning for Natural Hazards and Climate Change Adaptation	(PL 755)	40

Class enrollment has continued to grow steadily since the first courses were taught in 2015 as the importance of hazards resilience and climate change adaptation is becoming more apparent.

- Three-credit hour classes have enrolled up to 40 students, which is among the largest of all DCRP classes.
- The Speaker Series course has more than doubled in size from 14 to 31 students.

In terms of student recruitment to the University, over the past two years the Department of City and Regional Planning has experienced increasing numbers of student applicants who express interest in a focus on natural hazards, including pursuit of the certificate.

In addition to the core classes required by the certificate program, Dr. Smith has provided students with multiple out-of-class enrichment activities, including field trips to disaster-

impacted areas of the state; visits to communities that have been successful in mitigating flood hazards; and visits to the NCEM Emergency Operations Center. Dr. Smith has served on the committees of approximately twenty-eight students, including seven Ph.D. candidates. Dr. Smith has also mentored over twenty students throughout their academic careers in planning for resilience, has procured several internships, and has been instrumental in placing graduates in disaster-resilience related jobs.

Dr. Smith has also procured financial support for 27 students through various sources including the DHS Career Development Grant, the DHS Science and Engineering Workforce Development grant, and research assistantships on a variety of projects related to natural hazards and disasters, including work generated by HMDRRI.

4. *Students: Describe the demographics of students enrolled in your project courses; e.g., undergraduate, graduate, working professionals, etc. How many graduated during your project? Approximately how many are employed in the Homeland Security Enterprise?*

The certificate program is designed to serve enrolled graduate students and is not available to practicing professionals located outside the university. 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. Students are primarily enrolled at UNC-CH, although students from NC State and Duke Universities have also taken courses and earned the certificate.

Based on the high demand among employers for recent graduates who have studied with faculty associated with the Coastal Resilience Center and the former Coastal Hazards Center, the certificate program has provided a significant enhancement to participating students' graduate education and competitiveness in the job market. Our first Certificate recipient was hired by the State of North Carolina Division of Emergency Management where she is deeply involved in post-Hurricane Matthew disaster housing issues. Twenty-three students (21 masters students and 2 Ph.D. candidates) were hired to assist HMDRRI efforts during the summer of 2017, including 8 from North Carolina State University and one recent Duke University graduate. In the Fall of 2017, one certificate student began a year-long post-graduate fellowship at Oak Ridge National Labs.

CRC's four Workforce Development grant recipients have also found post-graduation positions. Former WFD students have gone on to work in a number of places, including the North Carolina Division of Emergency Management, pursuing a Ph.D. at MIT (focused on planning for natural hazards and climate change adaptation), a FEMA contractor, and as a planner in Saint Louis working on floodplain management issues. These students' final reports are in Appendix A of the Center report.

5. **Institutionalization:** *Describe how your project will be institutionalized beyond CRC funding.*
  - a. *What will be the sources of ongoing support?*
  - b. *Where in your institution will your project be maintained?*
  - c. *Who will be involved in sustaining your project?*

The certificate program was not developed as a source of revenue generation. However, now that the program is well established within the University, we are exploring the creation of a permanent faculty position in the Department of City and Regional Planning or at another university that will allow for the teaching of the courses as part of the responsibilities of the faculty position. The faculty position in the Department of Marine Sciences will be fully funded by UNC after the CRC's 5-year lifetime to provide a long-term programmatic contribution to the HS enterprise.

6. **Interactions with research projects:** *Describe your involvement with CRC's research partners. Include information on students participating in the CRC SUMREX program, and/or lectures and other activities delivered by CRC research partners at your institution. If applicable, include a discussion of how research findings drawn from CRC-funded efforts were incorporated into your project (e.g., curricula, training program, etc.)*

Seven researchers from across CRC have been invited to speak in each of the three core courses in the graduate certificate program. This has provided an opportunity for PI's to discuss their CRC-funded research and its connectivity to classroom materials. PI's have also served on guest panels that review student presentations and group projects. It is estimated that at least one CRC-affiliated PI or student will speak in each of the three certificate program classes in a given year. The Speaker Series course has also provided an opportunity for invited speakers to deliver lectures to students enrolled in the class, as well as the larger UNC-CH community. Some presentations have involved serving on a panel with other PI's, members of our Advisory Board, and DHS component agency officials. This is intended to expose students to the issues and connections that span research and practice (a key theme of the certificate program).

Student internships are encouraged and serve as an elective in the certificate program. The PI has actively solicited internship opportunities with research partners and practicing professionals working closely with the student to ascertain their interests. In addition, the PI regularly assesses the needs of potential employers.

The Disaster Resilient Design Curricula study findings are being incorporated into Certificate class lectures and a new 3-credit course titled Disaster Resilient Design will be developed in year 2019. The costs associated with course development will be funded by FEMA.

7. **Publications (Years 1-3):**

Journal Articles

Horney, Jennifer, Carolina Dwyer, Bhagath Chirra, Kerry McCarthy, Jennifer Shafer and Gavin Smith. 2018. Measuring Successful Disaster Recovery, *International Journal of Mass Emergencies and Disasters* 36(1): 1-22.

Gavin Smith, Lea Sabbag and Ashton Rohmer. 2018. A Comparative Analysis of the Roles Governors Play in Disaster Recovery, *Risk, Hazards & Crisis in Public Policy*. 9(2): 205-243. DOI: 10.1002/rhc3.12133.

Smith, Gavin. 2016. Remembrances of the Past, Concerns for the Future, and the Potential Resilience of a Small Coastal Town, *Southern Cultures*. Summer: 64-87.

Horney, Jennifer, Caroline Dwyer, Meghan Aminto, Phil Berke and Gavin Smith. 2016. Developing Indicators to Measure Post-Disaster Community Recovery, *Disasters* 41(1): 124-149.

Lyles, Ward, Philip Berke and Gavin Smith. 2015. Local Plan Implementation: Assessing Conformance and Influence of Local Plans in the United States, *Environment and Planning B: Planning and Design*.

### Book Chapters

Smith, Gavin. “The Role of States in Disaster Recovery: An Analysis of Engagement, Collaboration, and Capacity Building.” 2018. In *Building Community Resilience to Disasters: The Handbook of Planning for Disaster Resilience*, Routledge Press.

Smith, Gavin, Amanda Martin and Dennis Wenger. “Disaster Recovery in an Era of Climate Change: The Unrealized Promise of Institutional Resilience.” 2017. In *Handbook of Disaster Research, Second Edition*, Eds. Havidan Rodriguez, Joseph Trainor and William Donner. New York: Springer.

Smith, Gavin. “Pre- and Post-Disaster Conditions, their Implications, and the Role of Planning for Housing Recovery.” 2017. Chapter 18, pp. 277-292. In *Coming Home After Disaster: Multiple Dimensions of Housing Recovery*, Eds. Ann-Margaret Esnard and Alka Sapat. Boca Raton, Florida” CRC Press.

Smith, Gavin. “Planning for Sustainable and Disaster Resilient Communities.” 2015. Chapter 9, pp. 249-279. In *Hazards Analysis: Reducing the Impact of Disasters*, Ed. John Pine (2nd edition). Boca Raton, Florida: CRC Press.

Smith, Gavin. “Creating Disaster Resilient Communities: A New Hazards Risk Management Framework.” 2015. Chapter 10, pp. 281-308. In *Hazards Analysis: Reducing the Impact of Disasters*, Ed. John Pine. (2nd edition). Boca Raton, Florida: CRC Press.

Note: Publications involved working with CRC PI’s Jen Horney and Phil Berke as well as CRC students Lea Sabbag and Ashton Rohmer (WFD grant recipients) and Ph.D. candidates Ward Lyles and Amanda Martin.

8. **Lessons Learned:** *Assume you're starting your project again under the same conditions that existed at its beginning in Year 1. What would you do the same and why? What changes would you make and why?*

Key lessons that involve doing things the same way include: 1) The value of combining classroom lectures with field-based learning; 2) Inviting a multidisciplinary range of practitioners and policymakers, scholars, and others to meet and talk with students (to include asking speakers to discuss their own personal lessons that positioned them to succeed in the field); 3) Requiring group projects, to include analysis, presenting information to instructor and invited guests, and writing papers and reports summarizing the findings. Taken in total, this approach has led to what I believe to be a successful teaching method that blends research findings, theory, and practice in a highly applied, multi-disciplinary field.

Key lessons that involve doing things a different way include: 1) identifying another department that is more vested/interested in the certificate program, to include the provision of financial and faculty support. The Department of City and Regional Planning, while a great fit given the caliber of students interested in the topical area (and my own training) has not been very supportive of the certificate in terms of committing financial resources to address some or all of my time, even though the program has proven to be a vital recruitment tool for prospective students, and recent classes are among the largest in the department (to include drawing students from a number of other departments as well as students from North Carolina State University and Duke University) . If I had to do it over again, I would seek out a more supportive department at UNC or another university.

9. **Tables:**

**Table 1: Documenting CRC Education Project Courses and Enrollments**

Courses Developed and Taught by University of North Carolina under Project Expanding Coastal Resilience Education at UNC						
<u>Course</u>		<u>Developed (D), Revised (R), and/or Taught (T), by Project Year</u>				
<u>Number</u>	<u>Title</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
PLAN 755	Planning for Natural Hazards and Climate Change Adaptation	T	T	T		
Offering: Elective (E), Concentration (C), Minor (M)		C	C	C		
Enrollment		8	20	40		
PLAN 754	Speaker Series	T	T	T		
Offering: Elective (E), Concentration (C), Minor (M)		C	C	C		

	Enrollment	14	31	28		
PLAN 756	Survey of Natural Hazards and Disasters	T	T	T		
	Offering: Elective (E), Concentration (C), Minor (M)	C	C	C		
	Enrollment	9	15	26		

**Table 2: Documenting External Funding and Leveraged Support**

<b><u>2A: External Funding</u></b>			
<u>Title</u>	<u>PI</u>	<u>Total Amount</u>	<u>Source</u>
HMDRRI	Smith	\$100,000	UNC Collaboratory
HMDRRI	Smith	\$340,602	UNC Collaboratory
HMDRRI	Smith	\$251,797	State of NC Legislative Appropriation
HMDRRI	Smith	\$274,364	NC Division of Emergency Management
HMDRRI	Smith	\$72,483	NC Division of Emergency Management
Hurricane Matthew Disaster Recovery and Resilience Initiative Student Support.	Smith	\$25,000	North Carolina Community Foundation
Resilient Design Education Study	Smith	\$49,954	Department of Homeland Security
The Role of the State in Disaster Recovery: A Comparative Analysis of Gubernatorial Leadership and State Agency Official Engagement, Collaboration and Capacity Building.	Smith	\$30,000	FEMA

<p>The Role of the State in Disaster Recovery: A Comparative Analysis of Gubernatorial Leadership and State Agency Official Engagement, Collaboration and Capacity Building.</p>	<p>Smith</p>	<p>\$60,000.</p>	<p>Department of Homeland Security</p>
<p align="center"><b><u>2B: Leveraged Support</u></b></p>			
<p align="center"><u>Description</u></p>		<p align="center"><u>Estimated Annual Value</u></p>	
<p>Note: All of the external funding listed above has been leveraged to support the certificate program.</p>			
<p>Three offices provided by NCEM in the Hurricane Matthew Disaster Field Office for 1 year.</p>		<p align="center">\$50,000</p>	
<p>Supplies, lodging, and food to support the 5-day Princeville Design Workshop.</p>		<p align="center">\$50,000</p>	

**Table 3: Performance Metrics:**

**SMITH PERFORMANCE METRICS**

<u>Metric</u>	<u>Year 1</u> (1/1/16 – 6/30/16)	<u>Year 2</u> (7/1/16 – 6/30/17)	<u>Year 3</u> (7/1/17- 6/30/18)
HS-related internships (number)	2	14	
Undergraduates provided tuition/fee support (number)			
Undergraduate students provided stipends (number)		1	
Graduate students provided tuition/fee support (number)	2	2	2
Graduate students provided stipends (number)		13	23
Undergraduates who received HS-related degrees (number)			
Graduate students who received HS-related degrees (number)		3	5
Certificates awarded (number)	1	3	5
Graduates who obtained HS-related employment (number)	1	3	5
Lectures/presentations/seminars at Center partners (number)	3	3	4
DHS MSI Summer Research Teams hosted (number)			
Journal articles submitted (number)	1	1	2
Journal articles published (number)		2	2
Conference presentations made (number)	6	12	29
Other presentations, <b>interviews</b> , etc. (number)		11	14
Trademarks/copyrights filed (number)			
Requests for assistance/advice from DHS agencies (number)		1	5
Requests for assistance/advice from other agencies or governments		4	2
Total milestones for reporting period (number)	10	11	11
Accomplished fully (number)	9	11	11
Accomplished partially (number)	1		
Not accomplished (number)			

10. **Year 3 Education Activity and Milestone Achievement:** Use the chart below to show the status of your education activities and milestones as of June 30, 2018. Refer to your Year 3 Workplan to list your education activities and milestones. Explain why any activity or milestone was not completed.

**Education Activities and Milestones: Final Status as of 2018**

<b>Reporting Period 7/1/17 – 6/30/18</b>			
<b>Education Activities</b>	<b>Proposed Completion Date</b>	<b>% Complete</b>	<b>Explanation of why activity/milestone was not reached</b>
Teach certificate program courses	May 2018	100%	
Provide students with the knowledge and experience to actively contribute to the study and/or practice of natural hazards and disasters	June 2018	100%	
Recruit students into certificate program	June 2018	100%	
Attract and engage additional UNC faculty to coastal resilience to include developing new coursework (in addition to core courses already created and taught) that is closely aligned with the certificate and CRC's mission	June 2018	100%	Course developed by Mai Nguyen – Applied Housing Workshop to Hurricane Matthew Recovery
<b>Education Milestones</b>			
Deliver 3 core courses per year that support the certificate program	May 2018	100%	
Track student performance (including internships obtained and number of graduates).	June 2018	100%	
Four new students admitted to certificate program	June 2018	100%	
Develop one new elective course taught by UNC faculty (beyond the three core courses already developed)	June 2018	100%	Course developed by Mai Nguyen – Applied Housing Workshop to Hurricane Matthew Recovery

11. **Year 3 Transition Activity and Milestone Achievement:** Use the chart below to show the status of your transition activities and milestones as of June 30, 2018. Refer to your Year 3 Workplan to list your transition activities and milestones. Explain why any activity or milestone was not completed.

**Transition Activities and Milestones: Final Status as of 2018**

<b>Reporting Period 7/1/2017 – 6/30/2018</b>			
<b>Transition Activity</b>	<b>Proposed Completion Date</b>	<b>% Complete</b>	<b>Explanation of why activity/milestone was not reached</b>
Promote internship opportunities for students/recruit end users to host students	January 2018	100%	See HMDRRI; Private sector has hired a number of graduates.
Promote certificate program graduates to potential employers	June 2018	<u>100%</u>	All certificate program graduates employed following graduation.
<b>Transition Milestone</b>			
Document internships obtained	June 2018	100%	
Document post-graduation job placement	June 2018	100%	